20th Annual Meeting of the European Venous Forum

Save the Date
27-29 June 2019
University of Zurich

Tripartite meeting
19th Meeting of the EUROPEAN VENOUS FORUM

9th Annual Meeting of the Balkan Venous Forum Hellenic Phlebological Society Summit

28-30 June 2018
Athens, Greece

For more information, visit: europeanvenousforum.org
9th EVF HOW 2018

HANDS-ON WORKSHOP on VENOUS DISEASE

Grand Resort Limassol Cyprus
25-27 October, 2018

Registration Open!
Participants are limited to 100 – first come first served

The Annual EVF HOW provides the most comprehensive workshop in venous disease in Europe. It is for you who want an introduction to or need an update of the management of venous disease. Open to all specialty physicians, including physicians in training.
For more information, visit www.evfhq.com.

The EVF HOW Course benefits
- Unique program focused on hands-on learning
- Review of the “state-of-the-art” management
- Informal interaction with instructors during all sessions
- Bring your own case for discussion
- Informal and friendly atmosphere

The EVF HOW website enhances your learning experience
- Available before, during and after the workshop
- Free access included in the registration fee
- All presentations uploaded
- Contains suggested reading, important references and guidelines
- Case reports posted

For further details please contact:
Anne Taft
European Venous Forum, PO Box 172, Greenford, Middlesex, UB6 9ZN, UK
Tel/Fax: +44 (0) 20 8575 7044 | e-mail: admin@europeanvenousforum.org

EVF HOW Plus Course at Clinic Hohmad,
Thun/Switzerland
23-24 November 2018

Up to 18 Places, first come first served!

Meet the Experts!
Claudine Hamel-Dessou/F, Dominik Heim/CH, Hak Hong Keo/CH,
Olivier Pichot/F, Carlo Schlatter/CH, Jean-François Uhl/F, Torsten Willenberg/CH

Organisation: Dominik Heim/CH

Fees: €400
Access to clinic, refreshments, first day lunch and evening dinner
(all inclusive, except accommodation and travel)

IF YOU WANT TO:
- learn and improve Your Knowledge about sclerotherapy and phlebectomy
- improve Your Skills in duplex ultrasound scanning
- learn about practical sclerotherapy on patients
- learn about phlebectomy on patients and “scrub in” with the experts
- see a number of live cases, practice and discuss Your Questions with Experts in sclerotherapy and phlebectomy

Visit www.evfhq.com to access full programme and registration forms.
Contact Anne Taft with any queries at:
evhq@europeanvenousforum.org
Tripartite Meeting

19th Meeting of the European Venous Forum
9th Annual Meeting of the Balkan Venous Forum
Hellenic Phlebological Society Summit

28-30 June, 2018
Athens, Greece

Royal Olympic Hotel,
Athens, Greece

SCIENTIFIC PROGRAMME
AND BOOK OF ABSTRACTS

EDIZIONI MINERVA MEDICA
Under the auspices of:

International Union of Angiology
Union Internationale de Phlébologie – International Union of Phlebology

Senior Corporate Members

The European Venous Forum is extremely grateful to the following companies for their continued generous support

Senior Corporate Members

Cardinal Health
Medtronic
Servier International
Sigvaris

Corporate Members

Pierre Fabre
CONTENTS

Welcome message ........................................................................................................................... IV

Committees ........................................................................................................................................ V

Founder Members .............................................................................................................................. IX

Congress Information ........................................................................................................................ XIII

Scientific Programme Information ................................................................................................ XVI

Scientific Programme ....................................................................................................................... XVII

Thursday 28 June 2018 ................................................................................................................ XVII

Friday 29 June 2018 ........................................................................................................................ XX

Saturday 30 June 2018 ..................................................................................................................... XXII

European Venous Forum, Balkan Venous Forum, Hellenic Phlebological Society – Venous Workshop ........................................................................................................................................ XXIV

Electronic Presentations .................................................................................................................. XXVI

Thursday 28 June 2018 ................................................................................................................ XXVI

Friday 29 June 2018 ........................................................................................................................ XXVIII

Industry Supported Session ............................................................................................................. XXXII

List of Exhibitors ............................................................................................................................... XXXIII

Exhibition Plan .................................................................................................................................. XXXIV

Book of Abstracts .............................................................................................................................. 1

Authors’ Index .................................................................................................................................... 93
Welcome Message

Welcome to EVF Athens 2018


On behalf of the European Venous Forum, the Balkan Venous Forum and the Institute of Vascular Diseases we invite you to join us in Athens, Greece.

The European Venous Forum Annual Meeting 2018 is held in the city of Athens in 28-30 June 2018 in the Royal Olympic Hotel, which is situated at the heart of city of Athens and only few minutes away on foot from the most historic and spectacular areas of the city such as the Athens museum, Parthenon, Monastiraki market and Parliament square.

The meeting will be a Tripartite Meeting of European Venous Forum, Balkan Venous Forum and the Hellenic Phlebological Society.

EVF promotes quality and thus the scientific program will be devoted to highly competitive and carefully selected abstract oral and poster presentations on cutting-edge research developments, state-of-the-art Didactic sessions, Meet the Experts sessions with distinguished panelists to discuss with the audience controversial issues and a Keynote lecture delivered by Professor Ramesh Tripathi from Australia.

Important updates and re-evaluations of the latest technologies and techniques, diagnostic modalities, and data from clinical trials will be presented and discussed in a friendly environment promoting interactive discussion.

The target audience will be mostly Vascular Surgeons and Residents but also General Surgeons, Angiology Specialists, Phlebologists, Interventional Radiologists, Vascular Medicine Specialists, Dermatologists, Nurses, Technicians and all others interested in the management of venous disease.

We look forward to welcoming you in Athens hoping that you will enjoy not only the high quality scientific program but also the famous wholehearted Hellenic hospitality.

Athanasios Giannoukas  
EVF President and Local Chairman

Andrew Nicolaides  
Chairman of the EVF Board
COMMITTEES

**CONGRESS PRESIDENT**
Professor Athanasios Giannoukas
President, European Venous Forum

**SCIENTIFIC COMMITTEE / LOCAL ORGANISING COMMITTEE**
Niels Baekgaard (Denmark)
George Geroulakos (Greece)
Athanasios Giannoukas (Greece)
Dominik Heim (Switzerland)
Stavros Kakkos (Greece)
Nicos Labropoulos (USA)
Armando Mansilha (Portugal)
Andrew Nicolaides (Cyprus)
Tomasz Urbanek (Poland)

**EVF EXECUTIVE COMMITTEE**
President: Professor Athanasios Giannoukas (Greece)
President Elect (1st): Dr Dominik Heim (Switzerland)
President Elect (2nd): To be confirmed
Secretary: Professor Athanasios Giannoukas (Greece)
Treasurer: Dr Marianne Vandendriessche (Belgium)
Assistant Treasurer: Dr Oscar Maleti (Italy)
Chairman of the Board: Professor Andrew Nicolaides (Cyprus)

**IMMEDIATE PAST PRESIDENT**
Professor Armando Mansilha (Portugal)

**HONORARY MEMBERS**
Professor Eliete Bouskela (Brazil)  Professor Fedor Lurie (USA)
Professor Antonio Braga (Portugal)  Professor Mark Malouf (Australia)
Professor Joe Caprini (USA)  Professor Robert McLafferty (USA)
Professor Anthony Comerota (USA)  Professor Peter Neglen (Cyprus)
Professor Bo Eklöf (Sweden)  Mr Kypros Nicholas (UK)
Professor Jawed Fareed (USA)  Professor Seshadri Raju (Cyprus)
Professor Peter Gloviczki, (USA)  Professor Norman Rich (USA)
Professor Samuel Goldhaber (USA)  Professor Michel Samama (France)
Professor Roger Greenhalgh (UK)  Dr William Sandmann (Germany)
Dr John Hobbs (UK)  Professor Yuri Stokyo (Russia)
Professor Russel Hull (Canada)  Professor Andre van Rij (New Zealand)
Professor Lowell Kabnick (USA)  Dr Thomas Wakefield (USA)
Professor Robert Kistner (USA)  Dr Zivan Maksimovic (Serbia)
Professor Dinos Lazarides (Greece)
DATE FOR YOUR DIARY!

9th EVF HOW - Hands-on Workshop on Venous Disease
Limassol, Cyprus, 25-27 October 2018
www.evfvip.com

20th meeting of the European Venous Forum
Zurich, Switzerland, 27-29 June 2019
under the Presidency of Dr Dominik Heim

ANNUAL MEETINGS/PAST PRESIDENTS

Inaugural Meeting, 29 June – 1 July 2000
Lyon, France
Michel Perrin

2nd Meeting, 13-14 September 2001
Rome, Italy
Claudio Allegra

3rd Meeting, 14-16 June 2002
Berlin, Germany
Ulrich Schultz-Ehrenburg

4th Meeting, 27-29 June 2003
Lisbon, Portugal
Jose Fernandes e Fernandes

5th Meeting, 25-27 June 2004
Warsaw, Poland
Arkadiusz Jawien

6th Meeting, 24-26 June 2005
Crete, Greece
Asterios Katsamouris

7th Meeting, 29 June-1 July 2006
London, UK
Alun Davies

8th Meeting, 29 June-1 July 2007
Istanbul, Turkey
Mehmet Kurtoglu

9th Meeting, 26-28 June 2008
Barcelona, Spain
Marc Cairols

10th Meeting, 5-7 June 2009
Copenhagen, Denmark
Ilse Baekgaard

11th Meeting, 24-26 June 2010
Antwerp, Belgium
Marianne DeMaeseneer

12th Meeting, 30 June-3 July 2011
Ljubljana, Slovenia
Pavel Poredos

13th Meeting, 28-30 June 2012
Florence, Italy
Giovanni Mosti

14th Meeting, 27-30 June 2013
Belgrade, Serbia
Dragan Milic

15th Meeting, 26-28 June 2014
Paris, France
Jean-Luc Gillet

16th Meeting, 2-4 July 2015
St Petersburg, Russia
Evgeny Shaydakov

17th Meeting, 7-9 July 2016
London, UK
Andrew Bradbury

18th Meeting, 29 June – 1 July 2017
Porto, Portugal
Armando Mansilha

EUROPEAN VENOUS FOUNDATION

The European Venous Foundation, a UK registered charity (number 1100372) has been established to promote research into the causes, effects, treatment and management of venous disease and to support the work of the European Venous Forum. Further details can be found from the EVF Office.

TRUSTEES
Andrew Nicolaides
Michel Perrin
Arkadiusz Jawien
Marianne Vandendriessche
Kypros Nicholas
Anne Taft

EXECUTIVE DIRECTOR
Anne Taft, MSc
European Venous Forum
Beaumont Associates,
PO Box 172,
Greenford, Middx,
UB6 9ZN (UK)
Tel/Fax: +44 (0)20 8575 7044
Email: admin@europeanvenousforum.org

EXHIBITION MANAGER
Dawn Bond, MA
European Venous Forum
Beaumont Associates,
PO Box 172,
Greenford, Middx,
UB6 9ZN (UK)
Tel/Fax: +44 (0)20 8575 7044
Email: exhibition@europeanvenousforum.org
Preserves venous capacity¹,²

Treatment of chronic venous insufficiency

Treatment of hemorrhoids

¹,² For complete information, please refer to the Summary of Product Characteristics for your country. **The illustration represents a variant and its value.

Treatment of symptoms related to veno-lymphatic insufficiency in adults

Cyclo 3 Fort

RUSCUS ACULEATUS
HESPERIDIN METHYL CHALCONE
ASCORBIC ACID

GRADE 1A

PAROSTHEASY • PAIN • HEAVINESS • EDEMA • SENSATION OF SWELLING
<table>
<thead>
<tr>
<th>Founders Members</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mohammad Abu-Baker</td>
<td>Romania</td>
</tr>
<tr>
<td>Ingrid Achhammer</td>
<td>France</td>
</tr>
<tr>
<td>Obiekezie Agu</td>
<td>(UK)</td>
</tr>
<tr>
<td>Efthimios Alamanos</td>
<td>Greece</td>
</tr>
<tr>
<td>Jose Antonio Pereira Albino</td>
<td>Portugal</td>
</tr>
<tr>
<td>Joao Albuquerque R Castro</td>
<td>Portugal</td>
</tr>
<tr>
<td>Claudio Allegra</td>
<td>Italy</td>
</tr>
<tr>
<td>Zacharias Androulakis</td>
<td>Greece</td>
</tr>
<tr>
<td>Jecu Avram</td>
<td>Romania</td>
</tr>
<tr>
<td>Joao Paulo Azevedo Lopes dos Santos</td>
<td>Portugal</td>
</tr>
<tr>
<td>Paul Bachoo</td>
<td>(UK)</td>
</tr>
<tr>
<td>Giovanni Bandiera</td>
<td>Italy</td>
</tr>
<tr>
<td>Arie Bass</td>
<td>Israel</td>
</tr>
<tr>
<td>Pietro Bavera</td>
<td>Italy</td>
</tr>
<tr>
<td>Gianni BELCARÓ</td>
<td>Italy</td>
</tr>
<tr>
<td>Cleusa Ema Belczak</td>
<td>Brazil</td>
</tr>
<tr>
<td>Jean-Patrick Benigni</td>
<td>France</td>
</tr>
<tr>
<td>Antony Bertrand</td>
<td>Belgium</td>
</tr>
<tr>
<td>Imre Bihari</td>
<td>Hungary</td>
</tr>
<tr>
<td>Piero Bonadeo</td>
<td>Italy</td>
</tr>
<tr>
<td>Carlos Bone</td>
<td>Spain</td>
</tr>
<tr>
<td>Andrew Bradbury</td>
<td>(UK)</td>
</tr>
<tr>
<td>Stephen BROOKS</td>
<td>(UK)</td>
</tr>
<tr>
<td>Georges Buchheim</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Clare Butler</td>
<td>(UK)</td>
</tr>
<tr>
<td>Juan Cabrera</td>
<td>Spain</td>
</tr>
<tr>
<td>Alberto Caggiati</td>
<td>Italy</td>
</tr>
<tr>
<td>Marc Cairols</td>
<td>Spain</td>
</tr>
<tr>
<td>Joseph Caprini</td>
<td>USA</td>
</tr>
<tr>
<td>Pedro Castells</td>
<td>Spain</td>
</tr>
<tr>
<td>Mariella Catalano</td>
<td>Italy</td>
</tr>
<tr>
<td>Attilio Cavezzi</td>
<td>Italy</td>
</tr>
<tr>
<td>Timothy Chealte</td>
<td>(UK)</td>
</tr>
<tr>
<td>Philip Coleridge-Smith</td>
<td>UK</td>
</tr>
<tr>
<td>Carlos Costa de Almeida</td>
<td>Portugal</td>
</tr>
<tr>
<td>Andrew Court</td>
<td>(UK)</td>
</tr>
<tr>
<td>Denis Creton</td>
<td>France</td>
</tr>
<tr>
<td>Marios Daskalopoulos</td>
<td>Greece</td>
</tr>
<tr>
<td>Stella Daskalopoulou</td>
<td>Greece</td>
</tr>
<tr>
<td>Alun Davies</td>
<td>UK</td>
</tr>
<tr>
<td>Marianne De Maeseneer</td>
<td>Belgium</td>
</tr>
<tr>
<td>Howard E Denbo</td>
<td>USA</td>
</tr>
<tr>
<td>Nicholas Fassiadis</td>
<td>(UK)</td>
</tr>
<tr>
<td>Jose Fernandes e Fernandes</td>
<td>Portugal</td>
</tr>
<tr>
<td>Philip Lag Francois</td>
<td>Belgium</td>
</tr>
<tr>
<td>Norbert Frings</td>
<td>Germany</td>
</tr>
<tr>
<td>Jury Fritzsche</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Alessandro Frullini</td>
<td>Italy</td>
</tr>
<tr>
<td>Diego Garces</td>
<td>France</td>
</tr>
<tr>
<td>Claude Garde</td>
<td>France</td>
</tr>
<tr>
<td>Michael Georgiev</td>
<td>Italy</td>
</tr>
<tr>
<td>George Geroulakos</td>
<td>UK</td>
</tr>
<tr>
<td>Athanasios Giannoukas</td>
<td>Greece</td>
</tr>
<tr>
<td>Enrique Ginzburg</td>
<td>USA</td>
</tr>
<tr>
<td>Teimuraz Gogoladze</td>
<td>Georgia</td>
</tr>
<tr>
<td>Sue Goldsborough</td>
<td>(UK)</td>
</tr>
<tr>
<td>Joerg Dieter Gruss</td>
<td>Germany</td>
</tr>
<tr>
<td>Jean-Jerome Guex</td>
<td>France</td>
</tr>
<tr>
<td>Epaminondas Helmis</td>
<td>Greece</td>
</tr>
<tr>
<td>Tetsuya Hirano</td>
<td>Japan</td>
</tr>
<tr>
<td>Mo Howlader</td>
<td>UK</td>
</tr>
<tr>
<td>Christos Ioannou</td>
<td>Greece</td>
</tr>
<tr>
<td>Edmondo Ippolito</td>
<td>Italy</td>
</tr>
<tr>
<td>Takehisa Iwai</td>
<td>Japan</td>
</tr>
<tr>
<td>Mark Iwanicki</td>
<td>USA</td>
</tr>
<tr>
<td>Maria Iwanicki</td>
<td>USA</td>
</tr>
<tr>
<td>Georges Jantet</td>
<td>France</td>
</tr>
<tr>
<td>Arkadiusz Jawien</td>
<td>Poland</td>
</tr>
<tr>
<td>Maeso Lebrun Jordi</td>
<td>Spain</td>
</tr>
<tr>
<td>Claude Juhan</td>
<td>France</td>
</tr>
<tr>
<td>Eric Janin</td>
<td>France</td>
</tr>
<tr>
<td>Alexandros Kafetzakis</td>
<td>Greece</td>
</tr>
<tr>
<td>Marina Kafeza</td>
<td>Greece</td>
</tr>
<tr>
<td>Michael Kaiser</td>
<td>Germany</td>
</tr>
<tr>
<td>Stavros Kakkos</td>
<td>(UK)</td>
</tr>
<tr>
<td>Evi Kalodiki</td>
<td>(UK)</td>
</tr>
<tr>
<td>Yuk-Man Kan</td>
<td>(UK)</td>
</tr>
<tr>
<td>Dimitris Kardoulas</td>
<td>Greece</td>
</tr>
<tr>
<td>Svatopluk Kaspar</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Asterios Katsamouris</td>
<td>Greece</td>
</tr>
<tr>
<td>Konstandinos Katsenis</td>
<td>Greece</td>
</tr>
<tr>
<td>Holger Kiesewetter</td>
<td>Germany</td>
</tr>
<tr>
<td>Shaukat Khan</td>
<td>(UK)</td>
</tr>
<tr>
<td>Monica Kjaer</td>
<td>Denmark</td>
</tr>
<tr>
<td>Boguslaw Kompf</td>
<td>Poland</td>
</tr>
<tr>
<td>Theodoros Kostas</td>
<td>Greece</td>
</tr>
<tr>
<td>Kurt Kroeger</td>
<td>Germany</td>
</tr>
<tr>
<td>Pantelis Kyprianou</td>
<td>Cyprus</td>
</tr>
</tbody>
</table>
Peter Labas (Slovak Republic)  
Nicos Labropoulos (USA)  
Zaza Lazarashvili (Georgia)  
Javier Leal-Monedero (Spain)  
Christian Lebard (France)  
BB LEE (Korea)  
Marc Lefebvre-Vilardebo (France)  

Rhoda Mackenzie (UK)  
Castor Maduro-Maytin (Venezuela)  
Grzegorz Madycki (Poland)  
Armando Mansilha (Portugal)  
Federica Marchetti (Italy)  
Marc Mathieu (France)  
Paolo Mazza (Italy)  
Antoine Medvedovsky (France)  
Gabor Menyhei (Hungary)  
Josep M Mestres (Spain)  
Rene Milleret (France)  
Erich Minar (Austria)  
Luiz Miguel Moniz (Portugal)  
Damien Mosquera (UK)  
Wolfgang Muller (Austria)  
Oscar-Shucri Mustafa (Jordan)  
Kenneth Myers (Australia)  

Christel Nelson Zimdal (Sweden)  
Andrew Nicolaides (UK)  
Phillipe Nicolini (France)  
Christoph Ortland (Germany)  
Francisco Osse (Brazil)  
Ulrich Ostreicher (Germany)  

Nicolaos Pangratis (Greece)  
Hugo Partsch (Austria)  
Malay Patel (India)  
Jose Neves Paulos Antunies (Portugal)  
Mircea-Ludian Pavkov (Romania)  
Carlos Pereira-Alves (Portugal)  
Michel Perrin (France)  
Oliver Pichot (France)  
Alessandro Pieri (Italy)  

Christiane Querfeld (Germany)  
Eberhard Rabe (Germany)  
I Octavian Rada (Romania)  

Bozina Radevic (Yugoslavia)  
Albert-Adrien Ramelet (Switzerland)  
Stefano Ricci (Italy)  
Vaughan Ruckley (UK)  
Zbigniew RYBAK (Poland)  

Sergey Sapelkin (Russia)  
Gerhard Sattler (Germany)  
Michel Schadeck (France)  
Sanja Schuller-Petrovic (Austria)  
Ulrich Schultz-Ehenburg (Germany)  
Sandeep Shah (UK)  
Hans Seiter (Germany)  
Marian Simka (Poland)  
Enrico Sotgiu (Italy)  
Richard Spence (USA)  
Gerard Stansby (UK)  
Walerian Staszkievicz (Poland)  

Patricia Thorpe (USA)  
Sue Topp (UK)  
Emmanuel Touloupakis (Greece)  
Magdel Trinidad-Vazquez (Mexico)  
Ramesh Tripathi (New Zealand)  
Dimitrios Tsetis (Greece)  

Jean-Francois Uhl (France)  
Thomasz Urbanek (Poland)  
Marianne Vandendriessche (Belgium)  
Spyros Vasdekis (Greece)  
Frederic Vin (France)  

Kenneth Robert Ward (UK)  
Dean Wasserman (USA)  
Cees Wittens (The Netherlands)  
David Wright (UK)  

Claudia Liliana Yattara-Baratti (Switzerland)  
Mohamed Zahran (UK)  
Paolo Zamboni (Italy)  
Zaki Anas Zarka (UK)  
Krzysztof ZIAJA (Poland)  
Francesco Zini (Italy)  
Santiago Zubicoa (Spain)
Your partner in VTE prevention

19th European Venous Forum
28-30 June 2018 Athens - Greece

Cardinal Health
Essential to care™

Visit us at booth Number 3

Kendall SCD® 700 series
ELVeS® Radial®: 10 years of innovation in endovenous laser therapy

1+1=2 ELVeS® Radial® 2ring by biolitec®

LEONARDO®
The hightech laser for minimally invasive treatments

SAFE
GENTLE
EVIDENCE-BASED
PAINLESS

biolitec biomedical technology GmbH
Otto-Schott-Str. 15
07745 Jena, Germany
Tel.: +49 3641 519 530
E-Mail: info@biolitec.com
www.biolitec.com

biolitec®, LEONARDO®, ELVeS® and Radial® are registered trademarks owned by biolitec.
CONGRESS INFORMATION

CONGRESS DATES AND TIMES
Thursday 28 June, Friday 29 June, Saturday 30 June 2018

CONGRESS VENUE
Royal Olympic Hotel,
Athanasiou Diakou 28-34,
117 43, Athens, Greece
Tel: +30 210 92.88.400
Fax: +30 210 92.33.317
Email: info@royalolympic.com
Web: www.royalolympic.com

REGISTRATION DESK
The Registration Desk will be open at the following times:
Thursday 28 June 07.30 - 18.00
Friday 29 June 07.30 - 18.30
Saturday 30 June 08.00 - 13.30

ON SITE REGISTRATION
On site Registration will be available.
EVF Member € 600
EVF Trainee € 350
Non EVF Member € 700
Member, Balkan Venous Forum € 300
Delegate, Registered in Greece € 300
Congress Dinner € 70

Refreshments and lunch
Coffee breaks and lunch will be held in the Exhibition Area.

Registration Fee includes:
Congress documentation, Welcome Reception, Refreshments and Lunch, Certificate of Participation.
SOCIAL PROGRAMME

Opening Ceremony and Welcome reception
Thursday 28 June 2018: 18:30
Exhibition Area,
Royal Olympic Hotel
Join us and your friends, colleagues and exhibiting companies at the Welcome Reception in the Exhibition Area
This event is free of charge for all registered delegates and exhibiting companies.

CONGRESS DINNER
Friday 29 June 2018 at 20:30
Ioannis Rooftop Restaurant, Royal Olympic Hotel.
Cost: €70 per person.
Dress: Informal.

CONGRESS LANGUAGE
The official language of the congress is English. Simultaneous translation will not be provided.

CERTIFICATE OF ATTENDANCE
A certificate of attendance will be available upon completion of the Evaluation Form.

ACREDITATION
The meeting has been accredited by the EACCME with 19 European CMEs (ECMECs).

BADGES
Please wear your badges at all times.

MOBILE TELEPHONES
For the courtesy of the speakers and fellow delegates, please ensure that your telephone is switched off
during lectures.

LIABILITY AND INSURANCE
Neither the Organisers nor the Conference Secretariat will assume any responsibility whatsoever for damage
or injury to persons or property during the Conference.
Participants are recommended to arrange their personal travel and health insurance.

CHANGES
The Organisers reserve the right to adjust or change the programme as necessary.

CURRENCY
Currency is Euro.

MEDICAL AND TECHNICAL EXHIBITION
A trade exhibition of medical and pharmaceutical products will be staged in the Exhibition Areas, Refresh-
ments will be served in the exhibition area.
(Please see exhibition plan on page XXXIV)

ACKNOWLEDGEMENTS
The organisers of the meeting would like to thank the sponsors and exhibitors for their generous support of
the meeting.
GOLDEN SPONSORS
Alfasigma SpA
Medi GmbH & Co. KG
Medtronic

INDUSTRY SPONSORS
Alfasigma SpA
Bayer Hellas & Elpen Hellas
Cana Laboratoires
Leo Pharmaceuticals Hellas
MSD
Nanjing ECO Microwave System
Pierre Fabre
Servier International
SOFMEDICA
Vican
WL Gore

EXHIBITORS
Alfasigma SpA
BARD
Bauerfeind AG
biolitec biomedical technology GmbH
Cana Laboratories
Cardinal Health
Cook Medical
Innothera Laboratories
Kreussler & Co. GmbH
LSO Medical
Medi GmbH & Co. KG
Medtronic
Philips Volcano
Pierre Fabre
Servier International
Sigvaris Management AG
SOFMEDICA
STD Pharmaceutical Products Ltd
VENITI INC.
Vican

SPONSORS: VENOUS WORKSHOP
Angiodynamics
BARD
Biolas
biolitec biomedical technology GmbH
Cana Laboratories
Cook Medical
Elpen SA
GE Healthcare
Medic View
Medtronic
Nanjing ECO Microwave System
Philips Volcano
SOFMEDICA
VENITI INC

SUPPORTERS
GE Healthcare
Medic View

EDUCATIONAL SOCIETIES
Cochrane Vascular
Venous News /Charing Cross Symposium 2019
The scientific programme commences on Thursday 28 June with an abstract session on Venous Thromboembolism and Thrombolysis followed by an abstract session on Reflux and Varicose Vein Recurrence. At lunch-time on the Thursday and Friday there will be “Meet the Expert” Sessions, a chance to meet with the distinguished panellists and discuss hot topics on the management of venous thromboembolism and chronic venous disease. There are four didactic sessions organised jointly with the Balkan Venous Forum and the Hellenic Phlebological Society covering topics such as Updates Based on Results of Recent Studies, Challenging Problems in Chronic Venous Disease, Challenging Problems in Venous Thrombolism and Venous and Lymphatic Diseases Management.

The EVF invited Lecture will be given by Professor Ramesh Tripathi from Australia on Friday 29th June at 12.00 on “επο Θεος γεωμετρεῖ - A quest for God’s geometry in venous valve physiology and surgical repair”.

Thirty abstracts of high scientific quality will be presented. These were selected from over 140 abstracts submitted. In addition to the oral presentations, there are 46 ePoster presentations. The presentations will be available to view on screens situated in Alexandra Room on the ground floor of the venue. Presenters will meet with the chairmen at lunch-time on the Thursday or Friday. A prize will awarded to the top presentation, free registration at the EVF 2019 meeting.

The presentations from the AVF Servier Award Travelling Fellowship winners 2018, the Japanese Society of Phlebology winners 2018 and the ACP Abstract Award 2017 will take place on Friday 29th June.

All presentations must be formatted using PowerPoint. All presenters must bring their PowerPoint presentations on memory stick to the Slide Preview Desk at least 4 hours prior to presentation (or the previous evening for morning presentations).

The official language of the symposium is English. All presentations, questions and discussion will be held in English.

Abstracts of the presentations can be found at the rear of the book.

CME
The conference has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) with 19 European CME credits (ECMEC®s). Each medical specialist should claim only those hours of credit that he/she actually spent in the educational activity.

EVF PRIZE
The EVF prize will be awarded to the best 10 minute communication according to originality and quality. Prizes will be awarded to 1st, 2nd and 3rd place.

The winners of the 1st and 2nd prizes are awarded travelling grants to attend the annual meeting of the American Venous Forum in 2019. The three abstracts of the winners are sent to the American College of Phlebology who will select one and award a grant to present at the ACP meeting in November 2018 and the Japanese Society of Phlebology who will select two and award a grant for presentation at the meeting in 2019.
SCIENTIFIC PROGRAMME
Oral Presentations

THURSDAY, 28 JUNE, 2018

08:30-10:30 ABSTRACT SESSION 1: VENOUS THROMBOEMBOLISM AND THROMBOLYSIS
(10 minute presentation, 10 minute discussion)
Chair: Andrew Nicolaides (Cyprus), Marzia Lugli (Italy)

08:30 1.1 Magnetic resonance multi-sequence thrombus imaging (MSTI) in patients with acute iliofemoral deep vein thrombosis can predict thrombus lysability
Justinas Silickas1, Stephen Alan Black1, Alkystis Phinikaridou2, Adam M. Gwozdz1, Marcelo Andia Kohnenkampf3, Ashish S. Patel1, Bijan Modarai2, Alberto Smith1, Prakash Saha1
1Academic Department of Vascular Surgery, King’s College London and Vascular Surgery Department, Guy’s and St Thomas’ NHS Foundation Trust, London, UK; 2School of Biomedical Engineering and Imaging Sciences, King’s College London, London, UK; 3School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile
Submitted for the EVF Prize

08:50 1.2 Catheter-directed thrombolysis versus angiojet pharmacomechanical thrombectomy for the treatment of iliofemoral deep vein thrombosis
Academic Department of Vascular Surgery, Cardiovascular Division, St. Thomas’ Hospital, King’s College London, UK
Submitted for the EVF Prize

09:10 1.3 Use of micronized purified flavonoid fraction in combination with oral rivaroxaban improves clinical and ultrasound outcomes of proximal deep vein thrombosis
Kirill Lobastov, Ilya Schastlivitsev, Victor Barinov
Department of General Surgery and Radiology, Pirogov Russian National Research Medical University, Moscow, Russian Federation
Submitted for the EVF Prize

09:30 1.4 Comparison of in-patient outcomes and mortality of venous thromboembolism-related hospitalizations between solid and hematological malignancies: a nationwide inpatient sample database analysis
Xavier A. Andrade Gonzalez1, Harry E. Fuentes Bayne1, Ahmed Al-Ogaili1, Andres Mendez Hernandez2, Roberto A. Leon-Ferre3, Alfonso J. Tafur1, Joseph Caprini1
1Department of Medicine. John H. Stroger Jr. Hospital of Cook County, Chicago, IL, USA; 2Division of Medical Oncology, Mayo Clinic, Rochester, MN, USA; 3Vascular Medicine, Northshore University HealthSystem, Evanston, IL, USA; 4Pritzker School of Medicine, NorthShore University HealthSystem, IL, USA

09:50 1.5 Effect of underwater compression on leg venous diameters and calf volume
Christopher Lattimer1, Evi Kalodiki1, Sara Oberto1, Georgio Bergamo1, Alberto Caggiati1, Dimitris Kontothanassis1
1Josef Pflug Vascular Laboratory, Ealing Hospital and Imperial College & West London Vascular and Interventional Centre, UK; 2Department of Vascular Surgery, IRCCS multimeda, Sesto San Giovanni, Milan, Italy; 3Microlab Elettronica, Padua, Italy; 4Department of Anatomy, Sapienza University, Rome, Italy; 5Istituto Flebologico Italiano, Ferrara, Italy and Abanomed, Padua, Italy
10:10 1.6 Long-term follow-up of physical aspects in 53 iliac stents - evaluated by 3D CT - in patients treated with catheter-directed thrombolysis for iliofemoral DVT
Niels Bækgaard1, Pia Fogh1, Charlotte Strandberg1, Peter Myschetzky2, Sanne Jørgensen2, Lotte Klitfødt1, Sven Just1
1Vascular Clinic, Gentofte Hospital and Rigshospitalet, Copenhagen, Denmark; 2Imaging Department, Gentofte and Herlev Hospital, Copenhagen, Denmark

10:30-11:00 Refreshments and visit to Exhibition
Visit Poster Presentations

11:00-12:00 Industry Session 1 (see page XXXII)

12:00-12:20 ABSTRACT SESSION 2: REFLUX AND VARICOSE VEIN RECURRENCE
(10 minute presentation, 10 minute discussion)
Chair: Marianne Vandendriessche (Belgium), Miltos Lazarides (Greece)

12:00 2.1 Characteristics of venous reflux in different body positions: Role of gravity
Roman Tauraginskii1,2, Sergei Simakov3, Denis Borsuk4
1Department of Phlebology, International Institute of Health Care and Additional Research Institute of Clinical Medicine, Irkutsk, Russia; 2The Clinic of Phlebology and Laser Surgery “Vasculab” Ltd., Chelyabinsk, Russia; 3Department of Computer Science and Applied Mathematics, Moscow Institute of Physics and Technology, Moscow, Russia & Sechenov University, Moscow, Russia; 4The Education Department of Surgery of the South Ural Medical University, Chelyabinsk, Russia
Submitted for the EVF Prize

12:20 2.2 Stationary aggregates at the valve sinus: Markers of venous stasis, predictors of venous insufficiency?
Johann Chris Ragg, Krastina Stoyanova
Angioclinic Vein Centers, Berlin, Germany
Submitted for the EVF Prize

12:40 2.3 Recurrences after varicose vein treatment: anatomical presentation, symptomatology and risk factors
Andreas Renders1, Daphne Van Den Bussche2, Marc Vuylsteke2
1University Hospital Leuven, Belgium (KUL) – Sint Andries Hospital Tielt, Belgium; 2Department of Vascular Surgery, Sint Andries Hospital, Tielt, Belgium
Submitted for the EVF Prize

13:00 2.4 CHORUS: Chronic venous and hemorrhoidal diseases evaluation and scientific research results of an international observational survey
Parvez Sheikh1, Evgeny Zagryadsky2, Varut Lothsiriwat3, Abel Jalife Montano4, Pavle Korosok5, Heiko De Schepper6
1Department of Colorectal Surgery, Saifee Hospital, Mumbai, India; 2Medical Center «ON-CLINIC», Moscow, Russia; 3Department of Surgery, Faculty of Medicine Siriraj hospital/ Mahidol University Bangkok Thailand; 4Department of General Surgery, General Hospital of Mexico, Mexico City, Mexico; 5Medicinski Center IATROS, Ljubljana, Slovenia; 6Department of Gastroenterology and Hepatology, Antwerp University Hospital, Edegem, Belgium

13:20-14:20 Lunch and visit to Exhibition
e-POSTER PRESENTATIONS (see page XXVI)
Chair 1: Bo Eklof (Sweden), Pavel Poredos (Slovenia)
Chair 2: Mark Malouf (Australia), Malay Patel (India)
13:20-14:05  Meet the Experts Session
Hot Topics on Current Management of Venous Thromboembolism
Chair: Armando Mansilha (Portugal), Miltiadis Matsagkas (Greece)

13:20-13:35  DOACs experience with routine use and current shortcomings. J. Fareed (USA)


13:50-14:05  Current issues on the management of superficial vein thrombosis. A. Giannoukas (Greece)

14:20-15:20  Industry Session 2 (see page XXXII)

15:20-16:40  ABSTRACT SESSION 3: VARICOSE VEINS
(10 minute presentation, 10 minute discussion)
Chair: Niels Baekgaard (Denmark), Oscar Bottini (Argentina)

15:20 3.1  Compression stockings in the prevention of venous disorders in pregnancy
Dragan Milic¹, Sasa Zivic³, Dragan Bogdanovic¹, Milan Jovanovic⁴
¹Clinic for Cardiovascular and Transplant Surgery, Clinical Centre of Nis, Nis, Serbia & Medical School University of Nis, Nis, Serbia; ²Clinic for Cardiovascular and Transplant Surgery, Clinical Centre of Nis, Nis, Serbia; ³Institute for Public Health, Nis, Serbia; ⁴Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia and Medical School University of Nis, Nis, Serbia

15:40 3.2  Efficacy of micronized purified flavonoid fraction on postoperative symptoms after endovenous thermal ablation. A pilot randomized controlled study
Konstantinos Batzalexis, Christos Karathanos, Konstantinos Spanos, Nikolaos Roussas, Stylianos Koutsias, Miltiadis Matsagkas, Athanasios Giannoukas
Department of Vascular Surgery, University Hospital of Larissa, Faculty of Medicine, School of Health Sciences, University of Thessaly, Larissa, Greece
Submitted for the EVF Prize

16:00 3.3  Management of anterior accessory of the great saphenous vein
Johann Chris Ragg, Krastinya Stoyanova
Angioclinic Vein Centers, Berlin, Germany

16:20 3.4  Surgery versus foam sclerotherapy in patients with isolated anterior accessory saphenous vein varicosities: A randomized clinical study
Stamislava Tzaneva, Sabine Stolkovich, Harald Kittler, Kornelia Böhler
University Clinic of Dermatology, Medical University of Vienna, Austria

16:40-17:00  Refreshments and visit to Exhibition
Visit e-Poster Presentations

17:00-18:20  ABSTRACT SESSION 4: MISCELLANEOUS
(10 minute presentation, 10 minute discussion)
Chair: Eberhard Rabe (Germany), Tomasz Zubilewicz (Poland)

17:00 4.1  Validation of the 3D sym vein symptom assessment tool
Chrysanthe Papageorgopoulou, Stavros Kakkos, Konstantinos Nikolakopoulos, Ioannis Ntouvas, Spyros Papadoula, Ioannis Tsolakis
Vascular Surgery Department, University Hospital of Patras, Patras, Greece
Submitted for the EVF Prize

17:20 4.2  Effect of treadmill exercise on calf haemodynamics
Christopher Lattimer¹, Evi Kalodiki¹, Erica Menegatti¹, Sergio Gianesini¹
¹Josef Pflug Vascular Laboratory, Ealing Hospital and Imperial College & West London Vascular and Interventional Centre, UK; ²Vascular Diseases Center, University of Ferrara, Cona, Ferrara, Italy; ³Vascular Diseases Center, University of Ferrara, Cona, Ferrara, Italy and USUHS University, Bethesda, USA
17:40  4.3  A new risk assessment model better predicts venous thromboembolism risks in Asian surgical patients  
Lim Li Lee, Ngoh Chin Liew, Ping An Teh, Yan Jun Teoh  
Department of Surgery, University Putra Malaysia, Malaysia  
Submitted for the EVF Prize

18:00  4.4  Presentation patterns and prognosis of 109 isolated venous injuries in 99 patients  
Stavros Kakkos¹, Ioannis Tsolakis¹, George Markopoulous¹, Ioannis Maroulis², Efstratios Koletsis³,  
Fotini Fligou⁴, Konstantinos Panagopoulos⁵, Spyros Papadoulas⁵, George Lambropoulos⁵, Ioannis  
Ntouvas⁵, Konstantinos Nikolakopoulos⁵, Chrysanthi Papageorgopoulou⁵, Anastasia Kouri⁴  
¹Department of Vascular Surgery, University of Patras, Patras, Greece; ²Department of Surgery,  
University of Patras, Patras, Greece; ³Department of Cardiothoracic Surgery, University of Patras,  
Patras, Greece; ⁴Department of Anaesthesiology and Intensive Care Medicine, University of  
Patras, Patras, Greece

FRIDAY 29 JUNE 2018

08:30-10:30  ABSTRACT SESSION 5: VENOUS THROMBOEMBOLISM AND POSTTHROMBOTIC SYNDROME  
(10 minute presentation, 10 minute discussion)  
Chair: Dominik Heim (Switzerland), Pier Luigi Antignani (Italy)

08:30  5.1  Time of anticoagulant treatment initiation and severity of postthrombotic syndrome in patients with deep vein thrombosis: Prospective observational study  
Dumitru Casian, Vasile Culiuc, Marcel Sochirca, Evghenii Gutu  
Department of General Surgery, State University of Medicine and Pharmacy “Nicolae Testemitanu”,  
Chisinau, Moldova

08:50  5.2  Determination of a venous thrombus age with a new ultrasound sign  
Nicos Labropoulos, Anirudh Chandrashekar, Singh Gurtej, Nicholas Sikalas, Antonios Gasparis  
Stony Brook Medicine, Stony Brook, NY, USA

09:10  5.3  Increased risk for recurrent thromboembolic events during the first three months in patients with superficial vein thrombosis treated with tinzaparin  
Konstantinos Nikolakopoulos, Stavros Kakkos, Chrysanthi Papageorgopoulou, Ioannis Ntouvas,  
Spyros Papadoulas, Ioannis Tsolakis  
Vascular Surgery Department, University Hospital of Patras, Patras, Greece

09:30  5.4  Just-in-time: Importance of early duplex surveillance following deep venous stenting for the treatment of post-thrombotic syndrome  
Adam Gwozdz, Prakash Saha, Justinas Silickas, Leonardo Jones, Taha Kahn, Lawrence Stephenson,  
Anna L. Pouncey, Oscar Johnston, Ash S. Patel, Soundrie Padayachee, Albert Smith, Stephen A. Black  
Academic Department of Vascular Surgery, School of Cardiovascular Medicine and Science,  
St. Thomas’ Hospital, King’s College London, UK  
Submitted for the EVF Prize

09:50  5.5  Early identification of patients with high risk for iliop-femoral DVT  
Nizar Hariri¹, Brian Kaminski², Michael Mattin², John Fish³, Gregory Kasper³, Fedor Lurie³  
¹Jobst Vascular Institute, Toledo, Ohio, USA; ²ProMedica Health System, Toledo, Ohio, USA; ³Jobst  
Vascular Institute and University of Michigan, Ann Arbor, USA

10:10  5.6  Algorithm for preventing severe forms of venous insufficiency from the perspective of the correction of endothelial dysfunction and genetic status  
Igor Suchkov, Roman E Kalinin, Nina D Mzhavanadze  
Department of Vascular Surgery, Ryazan State Medical University Ryazan Russia
10:30-11:00 Refreshments and visit to Exhibition
Visit e-Poster Presentations

11:00-12:00 Industry Session 3 (see page XXXII)

12:00-12:30 EVF Invited Lecture
Chair: Mark Malouf (Australia), Kyriakos Klenidis (Greece)
"τον ο Θότο γραμματου" - A quest for God's geometry in venous valve physiology and surgical repair
Invited speaker: R. Tripathi (Australia)

12:30-13:30 Didactic Session 1: Updates based on results of recent studies
(12 minute presentation, 8 minute discussion)
Chair: Michel Perrin (France), Christos Lapiat (Greece)

12:30-12:50 Results of the EVRA Study. A. Davies (UK)

12:50-13:10 Current Status of thrombolysis. A. Comerota (USA)

13:10-13:30 Current Status and indications for intermittent pneumatic compression. J. Caprini (USA)

13:30-14:30 Lunch and visit to Exhibition
e-POSTER PRESENTATIONS (see page XXVI)
Chair 1: Bo Eklof (Sweden), Pavel Poredov (Slovenia)
Chair 2: Mark Malouf (Australia), Malay Patel (India)

13:30-14:15 Meet the Experts Session
Hot Topics in Chronic Venous Disease
Chair: Evgeny Shuryakov (Russia), Dragan Milic (Serbia)

13:30-13:45 What you should say to the patients about CVD progression? E. Rabe (Germany)

13:45-14:00 When the saphenous trunks should be spared? N. Labropoulos (USA)

14:00-14:15 Misconceptions of compression in venous disease. J. Caprini (USA)

14:30-15:00 EVF Annual General Meeting (Members Only)

15:00-16:40 Prize winning papers from the American Venous Forum, American College of Phlebology and the Japanese Society of Phlebology
(10 minute presentation, 5 minute discussion)
Chair: Anthony Comerota (USA), Athanasios Giannakos (Greece)

3 Presentations from American Venous Forum (AVF)

15:00 Pr1 Persistently low inferior vena cava retrieval rates in a population-based cohort
A. Mohapatra, N.I. Liang, R. Chaer, F. Tzeng
University of Pittsburgh Medical Centre, Pittsburg, PA, USA

15:15 Pr2 Nuclear magnetic resonance spectroscopic analysis of biofluids from patients with chronic venous disease
Imperial College, London, UK

15:30 Pr3 United States endovenous ablation practice trends: Four year review of medicare provider utilisation and payment
J.M. Crawford, A. Gasparitis, J. Almeida, Steve Elias, Thomas Wakefield, B.K. Lal,
N. Osborne, S. Amery, N. Labropoulos
1StonyBrook Medicine, Stony Brook, New York, USA; 2Miami Vein Centre, University of Miami, Miami, USA; 3Centre for Vein Disease, Englewood, New Jersey, USA; 4Cardiovascular Centre, University of Michigan, Ann Arbor, Michigan, USA; 5University of Maryland Medical System, Baltimore, Maryland, USA
Presentation from American College of Phlebology (ACP)

15:45 Pr4 Nutcracker syndrome can be over-diagnosed by duplex ultrasound – left ovarian vein reflux can be the cause of renal vein narrowing rather than an effect of obstructive flow
The Whiteley Clinic, Guildford, UK

2 Presentations from Japanese Society of Phlebology (JSP)

16:00 Pr5 Diagnostic efficacy of duplex and near-infrared spectroscopy-derived parameters in predicting post-thrombotic syndrome in patients with a first episode of DVT
T. Yamaki, Y. Sasaki, A. Osada, H. Sakurai
Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, Tokyo, Japan

16:15 Pr6 Comparison of efficacy and safety between DOAC and conventional therapy in patients with intermediate-risk pulmonary embolism
A. Tsuji, H. Hayashi, J. Ueda, N. Konagai, R. Asano, S. Fukui, T. Ogo, S. Yasuda
Department of Cardiology, National Cerebral and Cardiovascular Centre, Osaka, Japan

16:30-17:00 Refreshments and visit to Exhibition
Visit to e-Poster Presentations

17:00-19:00 Didactic Session 2: Challenging Problems in Chronic Venous Disease
(12 minute presentation, 8 minute discussion)
Joint Session of the European Venous Forum, Balkan Venous Forum and Hellenic Phlebological Society
Chair: Marc Vuylsteke (Belgium), Mehmet Kurtoglu (Turkey)

17:00-17:20 Quantitative changes in microcirculation across CEAP C0-C6 classes and the effect of VAD on such changes. E. Bouskela (Brazil)

17:20-17:40 Can we prevent progression of skin changes in CVD? N. Labropoulos (USA)

17:40-18:00 Efficacy of venoactive drugs in the management of symptoms and signs of chronic venous disease. S. Kakkos (Greece)

18:00-18:20 Current management of patients with C0s disease. M. Perrin (France)

18:20-18:40 How I select patients for foam sclerotherapy and how I can minimise the associated complications. J.J. Guex (France)

18:40-19:00 Can we reduce the risk of pigmentation after UGFS or thermal ablation? C. Hamel-Desnos (France)

20:30 Congress Dinner

SATURDAY 30 JUNE 2018

08:30-10:30 ABSTRACT SESSION 6: MISCELLANEOUS
(10 minute presentation, 10 minute discussion)
Chair: Marianne De Maeseneer (Netherlands), Ioannis Tsolakis (Greece)

08:30 6.1 Silent pulmonary embolism in patients with symptomatic deep vein thrombosis – an underestimated complication
Georgios Galyfos, Gerasimos Papacharalampous, Anastasios Papapetrou, Georgios Sachsamanis, Christiana Anastasiadou, Ioannis Sachmpazides, Sotirios Giannakakis, Georgios Kastrisios, Chrisostomos Maltezos
Department of Vascular Surgery, ‘KAT’ General Hospital, Athens, Greece
A randomized trial of class 2 and class 3 elastic compression in the prevention of recurrence of venous ulceration
Dragan Milic1, Sasa Zivic1, Dragan Bogdanovic1, Milan Jovanovic4
1Clinic for Cardiovascular and Transplant Surgery, Clinical Centre Nis, Nis, Serbia and Medical School University of Nis, Nis, Serbia; 2Clinic for Cardiovascular and Transplant Surgery, Clinical Centre Nis, Nis, Serbia; 3Institute for Public Health, Nis, Serbia; 4Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia & Medical School University of Nis, Nis, Serbia

Clinical efficacy of a new once-daily 1000 mg oral suspension of micronized purified flavonoid fraction in patients suffering from symptomatic chronic venous disease
Patrick Carpentier1, Debora Karetova2, Lourdes Reina Gutierrez3, Arnaud Maggioli4
1Vascular Center, Grenoble University Hospital, Grenoble, France; 2Karlovo Namesti Hospital, Praha, Czech Republic; 3Department of angiology and Vascular Surgery, Hospital de la Cruz Roja, Madrid, Spain; 4Institut de Recherches Internationales Servier, Suresnes, France

Utility of an algorithm combining VVSYM® and VCSS scores to predict disease severity in C2 patients
Lowell Kabnick1, Thomas Wakefield2, Mikel Sadek1, Jose Almeida1, Glenn Jacobowitz1
1New York University Langone Medical Center, New York, USA; 2University of Michigan, Michigan, USA; 3Miami Vein Center, University of Miami, Florida, USA

TRAP (Three-dimensional Restorative Ambulatory Phlebotherapy): A new conservative treatment for chronic vein insufficiency
Lucia Raco, Claudio Rosco, Sergio Capurro
Saint Francis Medical, London, UK

Mini-invasive foam sclerotherapy assisted ligation vs surgical flush ligation for incompetent sapheno-popliteal junction treatment
Sergio Gianesini1, Erica Menegatti, Maria Grazia Sibilla2, Diana Neuhardt1, Mirko Tessari2, Paolo Zamboni3
1University of Ferrara (Italy); USUHS University (Bethesda, USA); 2University of Ferrara (Italy); 3Comprehensive Interventional Care Center (Phoenix, USA); 4University Ferrara (Italy)

Towards a new classification of the deep vein thrombosis
T. Feodor1, A. Puskas2, S. Baila1, J. Alma Mitea3, O. Vittos3
1Medical Center for Diagnose, Ambulatory Treatment and Medical Prevention, Surgery Clinic "St.Nicolae", Bucharest; 2Angio-Center, Targu Mures, Romania; 3Institute of Cardiovascular Diseases, “C.C. Iliescu”, Bucharest, Romania; 4Scientific consulting, Servier Pharma, Bucharest, Romania; 5Medone Research, Bucharest, Romania

Facts about iliofemoral thrombosis. A. Gasparis (USA)

Expanding the treatment options of superficial vein thrombosis with rivaroxaban. E. Rabe (Germany)

Endophlebectomy of the common femoral vein and endovascular iliac vein recanalization for chronic ilio-femoral venous occlusion. M. Dumantepe (Turkey)
12:20-12:40 Retroperitoneal venous compression syndromes: A new surgical strategy based on qualitative and quantitative duplex ultrasound examination in the presence of CTA and/or MRI imaging
Wilhem Sandmann¹, Thomas Scholbach², Konstantinos Verginis¹, Jaser AlMaqublah¹, Sabrina Jacobi¹, Karin Rademacher-Möllmann¹
¹ Department of Vascular Surgery, EVK Mettmann, Teaching Hospital University Duisburg-Essen, ² University of Leipzig, Leipzig, Germany

12:40-13:00 Complications of endovascular treatment of May-Thurner syndrome.
G. Geroulakos (Greece)

13:00 Closing Remarks
Presentation of EVF 2019

13:15-14:30 Didactic Session 4: Venous and Lymphatic Diseases Management
(10 minute presentation, 5 minute discussion)
Balkan Venous Forum and Hellenic Phlebological Society
Chair: Antonis Papageorgiou (Greece), Elena Goranova (Bulgaria)

13:15-13:30 Surgical treatment of great saphenous thrombosis involving sapheno-femoral junction: a 5-year retrospective study in Albania. S. Xhepa (Albania)

13:30-13:45 Lymphedema stage III: What must/ can we do? T. Planinsek-Rucigaj (Slovenia)

13:45-14:00 Outcomes of the treatment of varicose veins with STEAM. I. Droc (Romania)

14:00-14:15 Pregnancy after thrombolysis for ilio-femoral DVT. Outcome and complications, 20 year experience. G. Szendro (Israel)

14:15-14:30 Challenging issues in patients receiving DOACs when emergency surgery required. E. Arnaoutoglou (Greece)

14:30-15:30 Balkan Venous Forum General Assembly (Alexander Hall)

15:30-19:30 EUROPEAN VENOUS FORUM, BALKAN VENOUS FORUM, HELLENIC PHLEBOLOGICAL SOCIETY
Venous Workshop: Current updates in venous diseases treatment
Convenors: A. Giannoukas (Greece), T. Urbanek (Poland), S. Vasdekis (Greece)
(Pre-registration is required)

15:30-17:15 Part 1
Station 1: Tips and tricks on foam sclerotherapy. J.J. Guex (France)
Station 2: Endovenous procedures with laser. T. Urbanek (Poland)
Station 3: Laser treatment for varicose veins. Ch. Karathanos (Greece)
Station 4: Mechano-chemical tumescentless endovenous treatment. A. Gasparis (USA)
Station 5: Venous stenting 1. G. Geroulakos (Greece)

17:15-17:30 Break
17:30-19:30  
**Part 2**

Station 1: Treatment of varicose veins with RF. A. Lazaris (Greece)
Station 2: Tumescentless endovenous treatment with glue. N. Roussas (Greece)
Station 3: Venous stenting 2. A. Gasparis (USA)
Station 4: IVC filters. D. Tsetis (Greece)
Station 5: Intravascular ultrasound in venous interventions. R. Kretzschmar (Belgium)
Station 6: Treatment of varicose veins with laser. K. Spanos (Greece)

19:30  
End of Meeting - Adjournment
The ePosters are available to view throughout the conference on screens in the Alexander Hall. Judging of the ePosters will take place on each day during the lunchtime period.

THURSDAY 28 JUNE 2018

SESSION 1: VARICOSE VEINS – VENOUS PROCEDURES
Chairmen: Bo Eklof (Sweden), Pavel Poredos (Slovenia)

eP1
Long-term vein diameter reduction by perivenous hyaluronan instead of tumescence for endovenous procedures
Johann Chris Ragg, Krastinya Stoyanova
Angioclinic Vein Centers, Berlin, Germany

eP2
Biomatrix sclerofoam: a first step to viscous microfoams
Johann Chris Ragg, Krastina Stoyanova, Samira El-Chamali, Oana Raluca Despa, Sebastian Kreis, Tobias Kobilke
Angioclinic Vein Centers, Berlin, Germany

eP3
Rationale for micronized purified flavonoid fraction administration during sclerotherapy of reticular veins and telangiectasias: results of the national, multicenter, observational program VEIN act prolonged-C1
Vadim Yu Bogachev, Boris V Boldin, Pavel Yu Turkin
Pirogov Russian National Research Medical University Moscow Russia

eP4
Accessory saphenous vein occlusion after endovenous laser ablation using a radial fiber for great saphenous vein insufficiency
Tsuyoshi Shimizu¹, Ayaka Yokosawa², Rie Horiuchi²
¹Department of Cardiovascular Surgery, Nagano Matsushiro General Hospital, Nagano, Japan;
²Department of Clinical Laboratory and Pathology, Nagano Matsushiro General Hospital, Nagano, Japan

ëP5
Randomized, comparative and prospective study between radiofrequency venous ablation and sclerotherapy with polidocanol foam 3% versus only radiofrequency venous ablation in saphenous veins of 1.5 cm of diameter or more
Iker León, Juan Salvador Blando, Hector Alarcón
Clinica Vascular Querétaro, Mexico

eP6
Tumescence saline flush sclerotherapy - another step in evolution
Marek Šumaj
Faculty Hospital Trenčín, Slovakia and Venasum, Modern Vein Care Centre, Trenčín, Slovakia

eP7
An original experimental model of autologous deep venous neovalve formation
Evgeny Shaydakov
Vascular Surgery Clinic, Saint-Petersburg, Russia

eP8
Surgical treatment of tumor etiology superior vena cava syndrome
Evgeni K. Gavriliov, Gennady G. Khubulava, Viktor Tarasov, Iliya Larin
1st Department of Surgery Improvement of Doctors of the Military Medical Academy, St Petersburg, Russia
eP9  Hyperpigmentation as an aesthetic feature of early postoperative period following mechanochemical obliteration of veins using the flebogif system
Sergey Markin1, Ivan Klimchuk2, Sergey Kalinin3, Nicolai Rogovoi3, Artem Mordvin1
1Surgery Department, Russian Academy of Sciences Hospital, St. Petersburg, Russia
2Surgery Department, City Hospital No. 40, Minsk, Belarus

eP10  The experience of the treatment of endovenous heat-induced thrombosis after endovenous laser ablation by rivaroxaban
Denis Borsuk, Alexey Fokin
The Education Department of Surgery of the South Urals Medical University, Chelyabinsk, Russia

eP11  Full energy efficiency for segmental ablation of big saphenous veins
C. Lebard, F. Zuccarelli
Clinique Internationale du Parc Monceau, Paris, France

eP12  The effect of fiber tip distance from saphenofemoral junction on outcomes after endovenous thermal ablation
Christos Karathanos, Petroula Nana, Konstantinos Spanos, Nikolaos Rousas, Athanasios Giannoukas
Department of Vascular Surgery, University Hospital of Larissa, Faculty of Medicine, School of Health Sciences, University of Thessaly, Larissa, Greece

eP13  Retroperitoneal endoscopic resection of the gonadal veins – A new method of treatment for pelvic congestion syndrome
Alexander Sashin, Sergey Gavrilov
Pirogov Russian National Research Medical University, Moscow, Russia

eP14  Thermal endovenous therapy is as effective as vein surgery in achieving healing of leg ulcers secondary to superficial vein incompetence
Ngoh Chin Liew, Limi Lee, Yan Jun Teoh
Department of Surgery, Faculty of Medicine and Health Sciences, University Putra Malaysia, Serdang, Malaysia

eP15  Early postoperative period complications after mechano-chemical obliteration of veins using the flebogif system
Sergey Markin1, Ivan Klimchuk2, Sergey Kalinin3, Nicolai Rogovoi3, Yana Gitsuk1
1Surgery Department, Russian Academy of Sciences Hospital, St. Petersburg, Russia; 2Surgery Department, City Hospital No. 40, Minsk, Belarus

eP16  Varicose vein surgery, does it matter who does it?
Ricardo Castro-Ferreira1, Alberto Freitas2, José Pinto3, Dalila Rolim4, José Videodo1, Emanuel Silva1, André Marinho1, Rodolfo Abreu1, Andreia Coelho1, Paulo Gonçalves Dias1, Sérgio Moreira Sampaio3, Adelino Leite-Moreira1, Armando Mansilha1, José Fernando Teixeira1
1Vascular Department, São João Hospital, Portugal; 2Faculty of Medicine, University of Porto, Portugal; 3Vascular Department, Padre Américo Hospital, Portugal; 4Vascular Department, Santa Maria Hospital, Portugal; 5Vascular Department, Coimbra Hospital, Portugal; 6Vascular Department, Santa Marta Hospital, Portugal; 7Vascular Department, Gaia Hospital, Portugal

eP17  The burden of depression in patients with chronic venous disease: Results of an epidemiological study from Romania
Daciana Branisteana1, Toni Feodor2, Iuliana Alma Mitea2, Oana Vittos4
1University of Medicine and Pharmacy Gr. T. Popa, Iasi, Romania; 2Medical Center for Diagnose, Ambulatory Treatment and Medical Prevention, Surgery Clinic “Sf.Nicole”, Bucharest, Romania; 3Scientific consulting, Servier Pharma, Bucharest, Romania; 4Scientific consulting, Medone Research, Bucharest, Romania
Clinical anatomy of the key perforating veins of the femoral and popliteal regions
Igor Suchkov1, Roman E. Kalinin1, Ivan Shanaev1, Nina D. Mzhavanadze1
1Ryazan State Medical University, Ryazan, Russia
2Ryazan Regional Clinical Cardiologic Dispensary, Ryazan, Russia

Vein valve defects and insufficiency in children
Johann Chris Ragg, Krastina Stoyanova
Angioclinic Vein Centers, Berlin, Germany

Long term follow-up of over 500 patients from a single centre, post varicose vein intervention; how much are patients still affected?
Lauren Shelmerdine, Ian Brown, Ben Banerjee
Vascular Surgery Department, Sunderland Royal Hospital, Sunderland, Tyne and Wear, UK

Anatomical characteristics of the most important perforating veins of the calf, ankle, and foot
Igor Suchkov1, Roman E. Kalinin1, Ivan Shanaev1, Nina D. Mzhavanadze1
1Ryazan State Medical University, Ryazan, Russia
2Ryazan Regional Clinical Cardiologic Dispensary, Ryazan, Russia

Laser treatment of recurrent gsv varicosity after classic surgery
Imre Bihari
A and B Clinic, Budapest, Hungary

Endoluminal Occlusion Foam Therapy (ENOF) on great saphenous veins: Occlusion, failure, and other outcomes
José Daniel Guerra1,2, Mariana Soto1,3, Ana Cristina Montenegro1,4, Pedro Iván Navarro1, Jorge Hernando Ulloa1,2
1Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá, Colombia; 2Facultad de Medicina Universidad de los Andes, Bogotá, Colombia; 3Facultad de Medicina Universidad del Bosque, Bogotá, Colombia; 4Facultad de Medicina Universidad de Antioquia, Bogotá, Colombia; 5Magister en Epidemiología

FRIDAY 29 JUNE 2018
SESSION 2: CHRONIC VENOUS DISEASE – VENOUS THROMBOEMBOLISM
Chairmen: Mark Malouf (Australia), Malay Patel (India)

The incidence of venous outflow obstruction as a complicating factor of retroperitoneal fibrosis
Taha Khan1, Adam Gwozdź2, James Budge2, Justinas Silickas2, Anna L. Pouncey1, Oscar Johnson1, Archie Fernando1, Tim O’Brien1, Stephen A. Black1,2
1Department of Vascular Surgery, Guy’s and St Thomas’ Hospital NHS Trust, London, UK; 2Academic Department of Vascular Surgery, Cardiovascular Division, St. Thomas’ Hospital, King’s College London, UK; 3Department of Urology, Guy’s and St Thomas Hospital, London, UK

Venous insufficiency treatment and the effect on quality of life
Malin Öster1, Oskar Nelzén2
1Örebro university, Örebro, Sweden; 2Department of Thoracic and Vascular Surgery, Linköping University, Linköping, Sweden

Chronic venous disease and hemorrhoids: Is there any association? Results of the Russian part of international program CHORUS
Alexey Bogomazov1, Evgeny Golovko2, Evgeny Zagryadsky3, Nikita A. Shichkin4
1Medical center “South”, Moscow Russia; 2Clinic «MEDEI MSK 12», Moscow, Russia; 3Medical Center «ON-CLINIC», Moscow, Russia; 4Clinical Hospita l I # 9, Yaroslavl’, Russia
A case-control study assessing the calf muscle function by near-infrared spectroscopy in patients with superficial venous insufficiency and deep venous thrombosis
Spyros Vasdekis, Konstantinos Antonopoulos, Vassilios Zymvragoudakis, Andreas Lazaris
Department of Vascular Surgery, University of Athens Medical School, “Attikon” University Hospital, Athens, Greece

Does superficial vein size correlate to advanced disease? Does size matter?
Vimalin Samuel
Department of Vascular Surgery, Christian Medical College and Hospital, Vellore, Tamil Nadu, India

Area versus diameter CT measurements for May Thurner Syndrome: Have we been measuring it all wrong?
Vassilios Zymvragoudakis, Konstantinos Palialexis, Stavros Spiliopoulos, Constantine Antonopoulos, Christopher Lattimer, George Geroulakos
1Department of Vascular Surgery, Attikon University General Hospital, Athens, Greece; 2Interventional Radiology Unit, Second Department of Radiology, Attikon University General Hospital, Athens, Greece; 3Interventional Radiology Unit, Second Department of Radiology, Attikon University General Hospital, Athens, Greece; 4Department of Cardiothoracic and Vascular Surgery, Evangelismos General Hospital, Athens, Greece; 5Department of Surgery and Cancer, Imperial College, London, United Kingdom; 6Department of Vascular Surgery, Attikon University General Hospital, Athens, Greece and Department of Surgery and Cancer, Imperial College, London, United Kingdom

Venous circulation disorders: Results of a study conducted on a global representative sample of patients from 8 countries
Catherine Regnier, Vishal Sanduja, Sophie Labat, Fabienne Goron, Ghislaine Salmat
1Servier International, Suresnes, France; 2HEC Paris, France; 3Harris Interactive, Healthcare Department, France; 4Harris Interactive, Data processing and statistics Department, Paris, France

Management of premenstrual transient phlebopathy by intermittent cyclic courses of treatment with micronized purified flavonoid fraction
Yuriy T. Tsukanov
Department of Surgery and Urology, Omsk State Medical University, Omsk, Russia

Adherence to nonoperative treatments in outpatients with chronic venous disorders: Results of VEIN act program
Jorge Ulloa Dominguez, Vadim Yu Bogachev, Sorin Baila, Johannes Walter, Andrès Marin, Dale Maharaj, José Manuel Jimenez Arribas
1Vascular Surgery Fundación Vascular de Colombia, Bogota, Colombia; 2Pirogov Russian National Research Medical University, Moscow, Russia; 3Vascular Surgery Department “C.C. Iliescu” Cardiovascular Disease Emergency Institute, Bucharest, Romania; 4Department of Vascular Surgery, Salzburg, Vienna, Austria; 5Hospital Metropolitano de Santiago de, Santiago, Dominican Republic; 6Caribbean Vein and vascular clinic St Clair Medical Hospital Port of Spain Trinidad; 7Division of Vascular Surgery, Hospital San Juan de Dios, Pamplona, Spain

Venous bed transformation after the elimination of pathological reflux in the great saphenous vein on the level of thigh: 3-year results
Elena Burleva, Sergey Turin, Oleg Smirnov, Rinat Fashiev
1Department of general surgery, Ural State Medical University, Ekaterinburg, Russian Federation; 2Department of vascular surgery, City Clinical Hospital №40, Ekaterinburg, Russian Federation; 3Medical center “Olmed”, Ekaterinburg, Russian Federation; 4Department of roentgen diagnostics, City clinical hospital №40, Ekaterinburg, Russian Federation
eP34  
20 years experience with “sourcing-technique” – A simple method to detect reflux routes causing an ulcer by duplex  
Alfred Obermayer, Ferdinand Steinbacher  
1Institute of Functional Phlebologic Surgery, Karl Landsteiner Society, 3390 Melk and St. Josef Hospital, Vienna, Austria; 2Institute of Functional Phlebologic Surgery, Karl Landsteiner Society, 3390 Melk and St. Josef Hospital, St Polten, Austria

eP35  
Peripheral neuropathic pain (PNPP) in venous ulcers (VU)  
Ruben Velletiaz  
Phlebology and Lymphology Service Colon Clinic, Mar del Plata Buenos Aires, Argentina

eP36  
Effects of hesperidine methylchalcone and vitamin C and their combination with ruscus extract and of micronized diosmine on ischemia followed by reperfusion  
Eliete Bouskela, Fatima Zely Garcia de Almeida Cyrino  
Laboratory for Clinical and Experimental Research on Vascular Biology (BioVasc), Biomedical Center, State University of Rio de Janeiro, Rio de Janeiro, Brazil

eP37  
Clinical efficacy of once-daily micronized purified flavonoid fraction 1000 mg tablet in patients with symptomatic chronic venous disease  
Alexander Kirienko, Djordje Radak, Arnaud Maggioli  
1Department of faculty surgery, Russian Scientific Research Medical University, Moscow, Russia; 2Institute for cardiovascular diseases, Clinic for Vascular Surgery, Belgrad, Serbia; 3Institut de Recherches Internationales Servier, Suresnes, France

eP38  
Early and intermediate results of surgical treatment of superficial venous thrombosis: Prospective observational controlled study  
Dumitru Casian, Vasile Culiciu, Florin Bzovii, Evgheni Gutu  
Department of General Surgery, State University of Medicine and Pharmacy “Nicolaie Testemitanu”, Chisinau, Moldova

eP39  
1 h NMR metabolic phenotyping of acute deep vein thrombosis  
Marina Kafeza, Richmond T. Bergner, Joseph Shalhoub, Sarah Onida, Elaine Holmes, Alun H. Davies  
1Academic Section of Vascular Surgery, Imperial College, London, UK; 2Division of Computational and Systems Medicine, Department of Surgery and Cancer Imperial College, London, UK

eP40  
Endovenous treatment of acute iliofemoral vein thrombosis with aspiration thrombectomy catheter – early clinical outcomes  
Efthymiios Beropoulis, Konstantinos Stavroulakis, Angeliki Argyriou, Giovanni Torsello, Theodosios Bisdas  
1Department of Vascular Surgery, St Franziskus Hospital, Münster, Germany; 2Department of Vascular Surgery and Endovascular Surgery, University Clinic of Münster, Munster, Germany

eP41  
Prior history of superficial vein thrombophlebitis as a predictor of recanalization after endovenous laser ablation  
Ovsep Mandzhikian, Irakly Kutidze, Anton Isakov, Ivan Ovchinnikov, Dmitry Morenko, Evgeny Letunovsky, Sergey Barsamyan  
1Vein Centre, Eramishantsev Hospital, Moscow, Russia; 2GarantClinic, Moscow, Russia; 3Centre of Laser Surgery, Moscow, Russia; 4Cardiology Clinic, Oxford University Hospitals NHS Foundation Trust, Oxford, UK

eP42  
Diagnosis and surgical treatment of floating thrombosis in inferior vena cava system in concomitant injury  
G.G Khubulava, A.V Akimov, E.K Gavrilov, Yuri Albornov, E.A Golubov, K.N Nikolaev  
1“Military-Medical Academy” n.a. Kirov of the Russian Federation, St. Petersburg, Russia; 2Main Military Clinical Hospital of the National Guard Troops of the Russian Federation, Moscow, Russia; 3“Military-Medical Academy” n.a. Kirov of the Russian Federation, St. Petersburg, Russia; 4Main Military Clinical Hospital of the National Guard Troops of the Russian Federation, Moscow, Russia
eP43  Initial experience for the use of therapeutic dose tinzaparin for a short period in the management of lower limb superficial thrombophlebitis and literature review
Andrew Khallaf, Ragai Makar, Arun Balakrishnan, Sameh Dimitri
Countess of Chester NHS Foundation Trust, Chester, UK

eP44  Oral rivaroxaban in the treatment of upper extremity deep vein thrombosis
Kirill Lobastov, Ilya Schastlivtsev, Leonid Laberko, Grigory Rodoman
Department of General Surgery and Radiology, Pirogov Russian National Research Medical University, Moscow, Russian Federation

eP45  Assessment of D-dimer level as a potential marker for venous thromboembolism in patients with cardiac implantable electronic devices
Igor Suchkov, Roman E. Kalinin, Nina D. Mzhavanadze, Olga Zhurina, Vladislav Povarov
Ryazan State Medical University, Ryazan, Russia

eP46  Heparin resistance in surgical patients: could individualized prophylaxis through recognition of high and low responders to antithrombotic treatment represent an option to optimal antithrombotic strategy in the future?
Ktenidis Kyriakos, Mixail Gionis
Department of Vascular Surgery, Aristotle University of Thessaloniki, Thessaloiki, Greece
INDUSTRY SUPPORTED SESSIONS

THURSDAY, JUNE 28, 2018

11:00-12:00  INDUSTRY SESSION: SUPPORTED BY A GRANT FROM PIERRE FABRE
CVD: from symptoms to microcirculation
Chair: Andrew Nicolaides (Cyprus)

11:00-11:20  What symptoms mean and how they influence our choice of investigations.
Marianne De Maeseneer (Belgium)

11:20-11:40  Is there a link between symptoms and microcirculation alternations?
Bernardo Barros (Brazil)
CEAP classification and capillaries morphology
Can capillaries and venules impairment explain symptoms in Cos patients?

11:40-12:00  How to choose the right VAD for the right patient, based on updated EVF Guidelines? Stavros Kakkos (Greece)

14:20-15:20  INDUSTRY SESSION: SUPPORTED BY A GRANT FROM ALFASIGMA
CVD: beyond signs and symptoms. Therapeutic advances
Chair: Armando Mansilha (Portugal), Jawed Fareed (USA)

14:20  CVD. A complex disorder. Andrew Nicolaides (Cyprus)

14:40  Underlying factors in CVD evolution. Ferdinando Mannello (Italy)

15:00  Sulodexide for signs, symptoms and beyond. Tomasz Urbanek (Poland)

FRIDAY, JUNE 29, 2018

11:00-12:00  Industry Session: Supported by a grant from Servier
Burden and Suffering in Chronic Venous Disease
Chair: Nicos Labropoulos (USA), Andrew Nicolaides (Cyprus)

11:00  Introduction. Nicos Labropoulos (USA)

11:03  Real world evidence: the seriousness of chronic venous disease. Alun H Davies (UK)

11:18  How does chronic venous disease progress from the first symptoms to the advanced stages? Nicos Labropoulos (USA)

11:33  MPFF for patients suffering from chronic venous disease: new evidence. J-H Ulloa (Colombia)

11:48  Discussion

11:58  Concluding remarks. Andrew Nicolaides (USA)
LIST OF EXHIBITORS AND SPONSORS

GOLDEN SPONSORS
Alfasigma SpA
Medi GmbH & Co. KG
Medtronic

INDUSTRY SPONSORS
Alfasigma SpA
Bayer Hellas & Elpen Hellas
Cana Laboratoires
Leo Pharmaceuticals Hellas
MSD
Nanjing ECO Microwave System
Pierre Fabre
Servier International
SOFMEDICA
Vican
WL Gore

EXHIBITORS
Alfasigma SpA
BARD
Bauerfeind AG
biolitec biomedical technology GmbH
Cana Laboratories
Cardinal Health
Cook Medical
Innothera Laboratories
Kreussler & Co. GmbH
LSO Medical
Medi GmbH & Co. KG
Medtronic
Philips Volcano
Pierre Fabre
Servier International
Sigvaris Management AG
SOFMEDICA
STD Pharmaceutical Products Ltd
VENITI INC.
Vican

SPONSORS: VENOUS WORKSHOP
Angiodynamics
BARD
Biosas
biolitec biomedical technology GmbH
Cana Laboratories
Cook Medical
Elpen SA
GE Healthcare
Medic View
Medtronic
Nanjing ECO Microwave System
Philips Volcano
SOFMEDICA
VENITI INC

SUPPORTERS
GE Healthcare
Medic View

EDUCATIONAL SOCIETIES
Cochrane Vascular
Venous News /Charing Cross Symposium 2019
EXHIBITION PLAN
Olympia Foyer (lower ground floor)
Attica Hall (ground floor)
BOOK OF ABSTRACTS
1.1 MAGNETIC RESONANCE MULTI-SEQUENCE THROMBUS IMAGING (MSTI) IN PATIENTS WITH ACUTE IlioFemoral Deep Vein Thrombosis Can Predict Thrombus Lysability

Justinas Silickas1, Stephen Alan Black1, Alkystis Phinikaridou2, Adam M. Gwozdz1, Marcelo Andia Kohnenkampf3, Ashish S. Patel1, Bijan Modarai1, Albert Smith4, Prakash Saha1

1 Academic Department of Vascular Surgery, King’s College London and Vascular Surgery Department, Guy’s and St Thomas’ NHS Foundation Trust, London, UK
2 School of Biomedical Engineering and Imaging Sciences, King’s College London, London, UK
3 School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile
4 Academic Department of Vascular Surgery, King’s College London, London, UK

AIM Catheter-directed thrombolysis (CDT) can reduce the incidence of post-thrombotic syndrome in certain patients with acute deep venous thrombosis (DVT). Thrombus age, based on history, is however, often unreliable and understanding the structural composition of the thrombus may be a better indicator of successful lysis. Lytic therapy is also associated with a significant increase in the incidence of bleeding complications and a personalised approach for the treatment of patients would be desirable. We have previously shown that non-contrast multi-sequence thrombus imaging (MSTI) by MRI in an experimental model of venous thrombosis, can predict the lysability of thrombus. The aim of this study was to assess whether MSTI can be translated into the clinic and help stratify which patients have thrombi that are most likely to lyse.

MATERIALS AND METHODS Multi-sequence thrombus imaging (MSTI) consisting of T1 mapping, magnetisation transfer and diffusion weighted imaging was carried out on patients with acute iliofemoral DVTs prior to thrombolysis. Patients were imaged using a 32-channel cardiac coil and a 3-Tesla MR scanner. Total scan duration was 35 minutes per patient. Contrast venography was used to assess success of lysis (absence of residual thrombus and no indication for stenting).

RESULTS In 39 patients imaged with MSTI: T1 relaxation times of non-lysed thrombi was higher compared with lysed thrombi (967±20 ms and 790±29 ms, P<0.001); MTR was similar between the groups (39±1 and 41±2, P=0.37) and mean ADC was higher in non-lysed compared to lysed thrombi (1.7±0.1 mm²/s and 1.4±0.1mm²/s, P=0.05). Receiver-operating characteristic (ROC) analysis showed a T1 area under the curve (AUC) of 0.81±0.06 (95%CI 0.69; 0.91), P<0.001; MTR AUC of 0.55±0.08 (95% CI 0.4; 0.7), P=0.5 and ADC AUC of 0.66±0.08 (95% CI 0.5; 0.8), P=0.047. The cut off values that distinguish lysed and non-lysed thrombi most accurately were 783ms for T1, 39% for MTR and 1.3 mm²/s for ADC. Using these cut-off values with all three sequences combined gave a higher sensitivity (89%) and specificity (100%) than any individual sequence alone.

CONCLUSION We have translated a multi-sequence MR thrombus imaging modality, developed in our murine model of DVT, into patients with iliofemoral DVTs and showed that it is possible to identify patients with thrombi that are most susceptible to lysis. Further optimisation of the image analysis methods is still required for ease of use, however, validation of the utility of these sequences in collaboration with other centres would be desirable.

Submitted for the EVF Prize.
CATHETER-DIRECTED THROMBOLYSIS VERSUS ANGIOJET PHARMACOMECHANICAL THROMBECTOMY FOR THE TREATMENT OF Ilio Femoral Deep Vein Thrombosis

Academic Department of Vascular Surgery, Cardiovascular Division, St. Thomas’ Hospital, King’s College London, UK

AIM

Early thrombus removal for the treatment of acute iliofemoral deep vein thrombosis (DVT) can reduce the incidence of post thrombotic syndrome (PTS). Percutaneous catheter-directed thrombolysis is often used, but the efficacy of adjunctive modalities is not yet determined. We aim to compare clinical outcomes of patients treated with catheter-directed lysis alone (CDT) compared to those treated with the addition of pharmacomechanical AngioJet thrombectomy.

MATERIALS AND METHODS

A retrospective review of all patients presenting to a tertiary centre, with symptomatic acute ilio-femoral DVT treated between 2011 and 2017 was carried out. Patient demographics, duration of symptoms, thrombosis risk factors, modality of treatment, duration of lysis and dosage of lytic therapy were collected. Outcome measures included the incidence of post-thrombotic syndrome (Villalta score), lytic success, primary, primary-assisted and secondary patency and the incidence of complications.

RESULTS

A total of 151 cases were identified, consisting of 81 patients treated with CDT versus 70 with adjuvant use of AngioJet thrombectomy. Baseline demographic data and prevalence of risk factors were comparable between groups. Incidence of post thrombotic syndrome, measured by Villalta score at 6 months and 1 year, were equivalent (P=0.28). On analysis of all cases treated with CDT vs. AngioJet, no significant difference in primary, primary-assisted and secondary patency over 2 years was observed. Subgroup analysis revealed that primary-assisted and secondary patency was improved amongst patients initially treated with “powerpulse” AngioJet thrombectomy, or with adjuvant mechanical AngioJet thrombectomy compared to CDT alone (P=0.029). However, following 48 hours of unsuccessful CDT, use of “powerpulse” AngioJet thrombectomy did not confer an advantage (P=0.001). The addition of AngioJet resulted in a reduction in lysis duration 40 hours (95% CI: 34-46) vs. 53 hours (95% CI: 49-58) P=0.0001 and a reduction in lytic dose (49 mg (95% CI: 42-55) vs. 57 mg (95% CI: 52-61) P=0.007) compared to CDT. This reduction was accentuated in cases initially treated with “powerpulse” AngioJet thrombectomy (27 hours [95% CI: 20-34] and 42 mg [95% CI: 34-50]). Incidence of complication were comparable between groups, with a major bleed rate of 0.66% due to an intracranial haemorrhage following CDT. The incidence of haemoglobinuria was increased following AngioJet thrombectomy (18.6% vs. 3.7%), however no statistically significant difference in acute kidney injury was observed (4.3% vs. 1.2%, P=0.244).

CONCLUSION

In this retrospective cohort, early use of adjuvant AngioJet thrombectomy resulted in improvement in primary-assisted and secondary patency, with a reduction in overall dose and duration of lysis. Later use of this device to treat recalcitrant thrombus less responsive to CDT appears ineffective. Further prospective studies and a cost-benefit analysis are warranted.

Submitted for the EVF Prize.
1.3 USING OF MICRONIZED PURIFIED FLAVONOID FRACTION IN COMBINATION WITH ORAL RIVAROXABAN IMPROVES CLINICAL AND ULTRASOUND OUTCOMES OF PROXIMAL DEEP VEIN THROMBOSIS

Kirill Lobastov, Ilya Schastlivtsev, Victor Barinov
Department of General Surgery and Radiology, Pirogov Russian National Research Medical University, Moscow, Russia

AIM To assess the impact of long-term micronized purified flavonoid fraction (MPFF) use in the treatment of proximal deep vein thrombosis (DVT).

MATERIALS AND METHODS This was a pilot randomized open-label study with blinded outcome assessor enrolled patients with their first episodes of popliteal-femoral DVT confirmed by Duplex ultrasound (DUS). All participants were randomized into two groups: 1) control that received a standard treatment with oral rivaroxaban, and 2) experimental that required additional treatment with MPFF 1000 mg/day. Both drugs were used for six months. Patients were followed-up for the whole treatment period with series DUS every two months in order to evaluate the degree of recanalization by popliteal (PV), superficial femoral (SFV), and common femoral (CFV) veins’ compressibility. Thrombi extension was assessed by modified Marder score. At the end of the follow-up period, patients were assessed with Villalta and venous clinical severity scores. Post-thrombotic syndrome (PTS) was diagnosed in those who had ≥5 Villalta score.

RESULTS Sixty patients were randomized to the control and experimental groups (n.=30 in each group). There were 40 men and 20 women with mean age of 56.3±13.4. Clinically unprovoked DVT was recognized in 65% of cases and left side localization in 45%. The median of Marder baseline scores was 15.0±4.8 and 11.1±4.3 in the experimental and control groups, respectively (P=0.002). After six months of treatment, the Marder score decreased to 0.8±1.6 and 2.8±3.5 in the main control groups, respectively (P=0.006). The generalized linear model repeated measures found a greater reduction in the Marder score (P<0.0001) and increased speed of recanalization on SFV (P<0.0001) with a non-significant tendency on the CFV (P=0.130) and PV (P=0.204) in the experimental group compared to the control one. Full recanalization of the PV at six months was observed in 24 patients (80%), who had received MPFF, and only in 17 persons (57%) of the control group (P=0.047). The median of Villalta score in the group treated with MPFF was significantly lower compared to the control one (2.9±2.7 versus 5.8±3.0 [P <0.0001]). The same difference was found for VCSS score (22.3±1.9 versus 4.9±1.9 [P <0.0001]). According to the Villalta score, PTS was recognized in six patients (20%) and 17 patients (57%) in the experimental and control groups, respectively (P=0.004).

CONCLUSION Long-term treatment with MPFF can increase the speed of deep vein recanalization and reduce the incidence of PTS diagnosed at six months in patients with proximal DVT treated with oral rivaroxaban.

Submitted for the EVF Prize.
1.4 COMPARISON OF IN-PATIENT OUTCOMES AND MORTALITY OF VENOUS THROMBOEMBOLISM-RELATED HOSPITALIZATIONS BETWEEN SOLID AND HEMATOLOGICAL MALIGNANCIES: A NATIONWIDE INPATIENT SAMPLE DATABASE ANALYSIS

Xavier A. Andrade Gonzalez1, Harry E. Fuentes Bayne1, Ahmed Al-Ogaili1, Andres Mendez Hernandez1, Roberto A. Leon-Ferre2, Alfonso J. Tafur3, Joseph Caprini4

1 Department of Medicine. John H. Stroger Jr. Hospital of Cook County, Chicago, IL, USA
2 Division of Medical Oncology, Mayo Clinic, Rochester, MN, USA
3 Vascular Medicine, Northshore University HealthSystem, Evanston, IL, USA
4 Pritzker School of Medicine, NorthShore University HealthSystem, IL, USA

AIM Venous thromboembolism (VTE) is a major cause of morbidity and mortality in patients with cancer and lead to an increased number of hospitalizations and healthcare resource expenditure. Cancer-associated thrombosis has been extensively studied in patients with solid malignancies, however it is unknown whether patients with hematological malignancies and thrombosis have comparable rates of hospitalization and inpatient outcomes, to patients with solid malignancies and thrombosis. We aim to compare the annual rates of VTE-related hospitalizations, cost, length-of-stay and in-patient mortality between patients with solid and hematological malignancies.

MATERIALS AND METHODS We identified patients with prevalent solid tumors (ST) (lung, pancreatic, gastric and breast cancer) and hematological malignancies (HM) (lymphoma, myeloproliferative neoplasms and myelodysplastic syndrome) from the Nationwide Inpatient Sample database from 2011-2014 using ICD-9CM coding. Hospitalizations where VTE was among the top-three diagnoses were considered VTE-related. We compared in-hospital outcomes of VTE hospitalizations using Chi-square and Mann-Whitney U test and used linear regression for trend analysis.

RESULTS We identified 4,651,805 admissions with a diagnosis of common ST (59.7%) and HM (40.3%). Patients were predominantly white (74.4%) female (55.8%), with a median age of 69 years (range 18-108). The most common ST types were lung (32%) and breast (15.8%) cancer. Among patients with HM the most prevalent were lymphomas (20.4%) and myeloproliferative neoplasms (12.1%). VTE-related hospitalizations were more common in patients with ST (4.6% vs. 2.9%; P≤0.01) and associated with a higher cost (median US$ 31277 vs. US$ 30926; P=0.039) and increased in-patient mortality (9.1% vs. 4.8%; P<0.01) when compared to patients with HM. The median length of stay was 4 days in both groups. During the study period, the annual rate of VTE-related admissions remained stable for ST (2011: 4.62% vs. 2014: 4.64%; P=0.69) and HM (2011: 2.98% vs. 2014: 2.93%; P=0.04); however the rate of pulmonary embolism (PE) hospitalizations increased for both ST (2011 2.68% vs. 2014: 2.84%; P≤0.01) and HM (2011: 1.29% vs. 2014: 1.40%; P≤0.01). The annual rate of mortality for PE-hospitalizations increased in patients with HM (2011: 8.8% vs. 2014:9.8%; P≤0.01) but not in patients with ST (2011: 12.3% vs. 2014: 12.2%; P=0.32).

CONCLUSION VTE-related hospitalizations were more common in patients with ST and had higher mortality compared to patients with HM. Trends of annual rates of PE-hospitalizations are rising in both groups and associated with higher mortality specifically in patients with HM. Patients with HM hospitalized for PE may benefit from early intervention, intense management and primary prevention when feasible.
1.5 EFFECT OF UNDERWATER COMPRESSION ON LEG VENOUS DIAMETERS AND CALF VOLUME

Christopher Lattimer¹, Evi Kalodiki¹, Sara Oberto², Georgio Bergamo¹, Alberto Caggiati⁴,
Dimitris Kontothanassis⁵

¹ Josef Pflug Vascular Laboratory, Ealing Hospital and Imperial College and West London Vascular and Interventional Centre, UK
² Department of Vascular Surgery, IRCCS multimedica, Sesto San Giovanni, Milan, Italy
³ Microlab Elettronica, Padua, Italy
⁴ Department of Anatomy, Sapienza University, Rome, Italy
⁵ Istituto Flegologico Italiano, Ferrara, Italy and Abanomed, Padua, Italy

AIM A medical compression stocking acts by tangential compression perpendicular to the centre. This causes more pressure over bony prominences and tendons (according to the Laplace law). At high doses of tangential compression there may be discomfort with skin damage. In contrast, hydrostatic compression is painless and provides radial pressure directly, without a tension interface. Anecdotal evidence suggests that hydrostatic pressure may cause the diameter of veins to decrease, but this has not been proven. The aim of this pilot, proof-of-concept study was to measure the effect of underwater pressure on the diameter of leg veins and calf volume changes in a controlled thermal environment.

MATERIALS AND METHODS Twelve legs (C₀=6, C₁=2, C₃=4) from 6 volunteers (3 male) had their deep and superficial veins scanned standing, with ultrasound. Strain gauge plethysmography (SGP) was applied around the widest calf circumference and used to record the% changes in a calf volume slice. This was performed first out of the water and then in water (34 °C) at a depth of 1.1 meters. Prior to the study, all measuring points were marked on the skin to ensure that the same part of each vein was insonated. Care was taken to apply sufficient ultrasound gel over the skin, to prevent any probe pressure from distorting the vein. Probe-skin contact is not necessary in water because it is an excellent transmission medium.

RESULTS The median (inter-quartile range) were: age 56 (49-59) years, weight 90 (74-120) kg, height 177 (163-182) cm and BMI 27.6 (25.9-32.4), respectively. Hydrostatic compression significantly reduced the diameter of the deep and superficial veins in the thigh and knee (Table I). Contrary to expectation, the saphenous vein diameter at the ankle was not reduced by the pressure. The calf volume reduction in water was 5 (3-6)%., P=0.002, with a further reduction after 10 walking steps to 5.2 (3.7-6.7)%., P=0.012.

<table>
<thead>
<tr>
<th>Venous diameter</th>
<th>Median</th>
<th>IQR</th>
<th>Range</th>
<th>P (Wilcoxon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Femoral vein</td>
<td>Land</td>
<td>10.7</td>
<td>10.3-12.1</td>
<td>9.2-20</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>9.8</td>
<td>8.8-11.4</td>
<td>6.9-18</td>
</tr>
<tr>
<td>Popliteal vein</td>
<td>Land</td>
<td>9.9</td>
<td>8.7-11.4</td>
<td>7.6-15.4</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>8.3</td>
<td>7.6-9.6</td>
<td>5.5-10.8</td>
</tr>
<tr>
<td>Saphenous upper</td>
<td>Land</td>
<td>5.6</td>
<td>4.7-6.2</td>
<td>3.6-6.5</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>5</td>
<td>3.9-5.3</td>
<td>3.2-6.9</td>
</tr>
<tr>
<td>Superficial knee</td>
<td>Land</td>
<td>4.9</td>
<td>4.2-6.2</td>
<td>3.9-7.6</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>4.4</td>
<td>3.8-5</td>
<td>2.5-5.4</td>
</tr>
<tr>
<td>Saphenous ankle</td>
<td>Land</td>
<td>3.5</td>
<td>2.8-4.5</td>
<td>2.2-4.9</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>3.5</td>
<td>2.9-4.3</td>
<td>2.4-5.4</td>
</tr>
</tbody>
</table>

CONCLUSION This study has shown that hydrostatic compression significantly reduces deep and superficial venous diameters and calf volume in normal legs. This may be one way how balneotherapy (spa treatment) works in improving limb drainage. Further work is required to determine the effect of hydrostatic compression in patients with chronic venous insufficiency.
1.6 LONG-TERM FOLLOW-UP OF PHYSICAL ASPECTS IN 53 ILIAC STENTS – EVALUATED BY 3-D CT – IN PATIENTS TREATED WITH CATHETER-DIRECTED THROMBOLYSIS FOR IlioFemoral DVT

Niels Bækgaard¹, Pia Fogh¹, Charlotte Strandberg², Peter Myschetzky², Sanne Jørgensen², Lotte Klitføl¹, Sven Just²

¹ Vascular Clinic, Gentofte Hospital and Rigshospitalet, Copenhagen, Denmark
² Imaging Department, Gentofte and Herlev Hospital, Copenhagen, Denmark

AIM To identify physical aspects such as fracture, kinking, stenosis and tapering in iliac stents with minimum 5-years of follow-up in patients treated with catheter-directed thrombolysis (CDT) for iliofemoral DVT. This has never been investigated before in a large scale. The study does not intend to qualify the most optimal stent.

MATERIALS AND METHODS 3-D CT was used for visualization of the iliac vein segment including the stents. Estimation of patency defined as normal flow profile and less than 15% lumen reduction was done by Duplex ultrasound (DUS) and not CT, due to refusal from the Ethic Committee to offer contrast medium in the CT imaging. After median follow-up of 13.2 years (range: 5.2-15.8 years) 45 patients with 53 stents were enrolled with a median age of 35 years (range: 16-59 years), 39 were females and 42 left sided. The stents included 41 Wallstents, 8 Memotherm stents, 3 Smart stents and 1 Symphony stent.

RESULTS 3-D CT showed normal stent configuration in 45 (85%) stents including 37 Wallstents, 6 Memotherm stents, 1 Smart stent and 1 Symphony stent in 38 patients with normal DUS estimated flow pattern except in one case in which two stents occluded 4 years earlier. In the remaining 8 (15%) stents 3-D CT showed: 1 Wallstent with 50% stenosis (DUS confirmed stenosis with occlusion 2 years earlier), 1 fracture with 30% kinking and 50% stenosis in the middle part of 1 Memotherm stent (DUS confirmed stenosis, not fracture), 30% kinking in a 5 mm overlap between 2 Wallstents (DUS not confirming the kinking), 1 Smart stent with 40-50% stenosis (DUS confirmed), 1 Wallstent with 25% stenosis cranially=tapering (DUS confirmed), 1 Memotherm stent with 50% stenosis under a severe calcified right common iliac artery (DUS confirmed), and finally 70% stenosis proximally in a Smart stent (with a normal Memotherm stent below) (DUS confirmed).

CONCLUSION The stents act with high physical stability without any changes after long-term follow-up in a total of 85% inserted iliac stents evaluated by 3-D CT in patients treated with CDT for iliofemoral DVT. The remaining 15% included changes with fracture, kinking, stenosis and tapering. DUS confirmed occlusion of 3 stents and grade of stenosis in all cases but not fracture or kinking.
2.1 CHARACTERISTICS OF VENOUS REFLUX IN DIFFERENT BODY POSITIONS: ROLE OF GRAVITY

Roman Tauraginskii1,2, Sergei Simakov3, Denis Borsuk4
1Department of Phlebology, International Institution of Health Care and Additional Research Institute of Clinical Medicine, Irkutsk, Russia
2The Clinic of Phlebology and Laser Surgery “Vasculab” Ltd., Chelyabinsk, Russia
3Department of Computer Science and Applied Mathematics, Moscow Institute of Physics and Technology, Moscow, Russia and Sechenov University, Moscow, Russia
4The Education Department of Surgery of the South Urals Medical University, Chelyabinsk, Russia

AIM The general paradigm is that vertical body position and gravity are existential conditions for venous reflux in patients with the chronic venous disorders. The aim of our research was to refine the role of gravity in venous reflux and to determine the factors influencing the volume flow and absolute volume of venous reflux.

MATERIALS AND METHODS We consider 61 lower limbs with the primary incompetence of the great saphenous vein (GSV) with reflux duration more than 0.5 s. The following parameters: diameter (D-GSV), cross-sectional area (S) cm², average velocity (TAMEAN) cm/s, reflux time (RT), in seconds, were measured on the Duplex ultrasound with PW Doppler. Reflux volume flow (Q) mL/s and absolute reflux volume (ARV) mL were calculated. The measurements were carried out in three body positions: horizontal, sitting upright with straight legs and vertical. Distal automatic cuff compression (120 mmHg) was used as provocation maneuver. The analysis of the influence of the body mass index (BMI), competent or incompetent terminal valve (Tv SFJ) and diameter GSV standing up, on the ARV were carried out.

RESULTS There was a 100% occurrence of reflux in patients standing and sitting upright, with straight legs, after applied automatic cuff distal compression as an external source of force. The reflux was observed in 56 (91.8%) cases and wasn’t observed in 5 (8.2%) cases with the horizontal position. In the last 5 cases D-GSV were less than 3.4 mm. However, reflux was present in the 7 of 56 cases when D-GSV <3.4 mm (from 2.2 mm to 3.3 mm) in a horizontal position. In this case, the relationship between existing venous reflux and decreasing D-GSV was not observed. The change of body position impacted the basic physical characteristics of reflux. More significant deviations of the parameters were observed in comparison of those horizontal and those sitting upright with straight legs: S by 65% (P=0.0048), TAMEAN by 103.25% (P=0.0212), RT by 50.53% (P=0.0023), Q by 180.14% (P=0.0358) and ARV by 407.84% (P=0.0002). When comparing sitting upright with straight legs and vertical positions, a smaller, statistically significant, increase in the parameters was observed. An analysis of the impacts of BMI, D-GSV and Tv SFJ on ARV showed that each component affects ARV in all body positions.

CONCLUSION The gravity is not an existential condition for venous reflux. It is one possible type of different external forces. The factors influencing the volume flow and absolute reflux volume are BMI, D-GSV and condition of the terminal valve regardless of body position.

Submitted for the EVF Prize.
2.2 STATIONARY AGGREGATES AT THE VALVE SINUS: MARKERS OF VENOUS STASIS, PREDICTORS OF VENOUS INSUFFICIENCY?

Johann Chris Ragg, Krastina Stoyanova
Angioclinic Vein Centers, Berlin, Germany

AIM Using novel high resolution ultrasound systems (HRU), valvular structures and low-flow microaggregates may be depicted today in a more detailed way. We recently reported the existence of particle aggregations within valve sinus which are neither sludge nor thrombus (AVF 2017, Servier travel award, EVF 2017), detected by high resolution ultrasound (>14 MHz). This study is about the analysis of 180 vein valves showing motion-resistant aggregates (MRA).

MATERIALS AND METHODS In 100 consecutive patients (58 f, 32 m; 42-64 years old) presenting with epifascial venous insufficiency, a total of 180 saphenous vein valves with MRA were selected for closer ultrasound analysis (14-16 MHz, peak up to 40 MHz, Vevo MD).

RESULTS Motion-resistant aggregates were associated to low or stagnant flow (<1 cm/s) in 165/180 cases (91.7%). Alteration of sinus hemodynamics (reduction of flushed sinus volume) was present in 102/180 cases (56.7%). Restriction of cusp function due to aggregates while maintaining valve closure was seen in 64 cases (35.6%). Total fixation of cusps but no reflux in 6/180 cases (3.3%). 8/180 cases (4.5%) showed a total fixation of cusps as source of reflux (Figure 1). In segments with significant reflux (>1000 ms, >10 cm/s), regression and loss of valve structures with less or no valvular aggregates was the typical finding.

CONCLUSION Stationary blood cell aggregates at the valve sinus seem to indicate different stages of venous insufficiency: A) alteration of sinus hemodynamics; B) restriction of cusp function; C) fixation of cusps without reflux; D) fixation of cusps with reflux; E) decrease of valve structures and aggregates; F) loss of valve structures. As saphenous insufficiency is supposed to begin in one or two locations, valve analysis allows “to read” the history of individual epifascial disease and locate its origin. The study will be continued, adding histology and cytology.

Submitted for the EVF Prize.
2.3 RECURRENCES AFTER VARICOSE VEIN TREATMENT: ANATOMICAL PRESENTATION, SYMPTOMATOLOGY AND RISK FACTORS

Andreas Renders¹, Daphne Van Den Bussche², Marc Vuylsteke²

¹University Hospital Leuven, Belgium (KUL), Sint Andries Hospital Tielt, Belgium
²Department of Vascular Surgery, Sint Andries Hospital, Tielt, Belgium

AIM In this single center study, we looked for the possible anatomical presentation of varicose vein recurrence after interventional treatment. Also risk factors and symptomatology were assessed.

MATERIALS AND METHODS Between September 2016 and December 2017, in 141 consecutive patients presenting with varicose vein recurrence, 199 legs have been examined using Duplex ultrasound. Inclusion criteria were patients who had undergone an interventional truncal treatment for varicose veins at least one year before examination. Those patients should have signs (C2 or more) and symptoms of varicose veins. With Duplex ultrasound, the anatomical presentation of that recurrence was assessed. Possible presentations were new truncal incompetences or extension of previous documented truncal incompetences, recanalisation of previous ablated veins, neovascularisation, incompetence of perforator veins, pelvic veins, varicose veins without any feeding source. Using a questionnaire, in each patients possible risk factors and symptoms of varicose disease were noted.

RESULTS The average age of the included patients was 53.5 years, female predominance (61%) and the majority of examined legs were left sided (51.8% vs. 48.2%). Average body mass index (BMI) was 26.2 kg/m². Most frequent risk factors were “having a positive family history” (76.8%) and prolonged standing (>4 h/day). Noted symptoms were respectively in decreasing prevalence: tired heavy legs, pain and cramps, restless legs, itching, skin changes. 65.3% (n.=138) of all examined legs had a previous truncal ablation using endovenous thermal ablation (EVTA) while 24.12% (n.=48) underwent high ligation and stripping (HL&S). Other noted treatments were Foam sclerotherapy (n.=9) and others. 75.3% (n.=150) of the examined legs had a previous treatment of an incompetent Great Saphenous Vein (GSV). Neovascularisation at the saphenofemoral and saphenopopliteal junction was the most commonly noted anatomical presentation of recurrence. This was found more frequently after HL&S (40.6%) compared to EVTA (26.5%). Progression of the venous disease (extension of reflux in documented truncal incompetence and/or newly formed truncal insufficiency) was found in 22%. Most prevalent different axis insufficiency was the Anterior Accessory saphenous Vein (AASV) for EVTA (16.3%) and the Small Saphenous Vein (SSV) for the HL&S group (16.6%) after treatment for GSV incompetence. Incompetent perforating veins were found in 30.6% of all patients, with no significant difference between patients treated with HL&S compared to EVTA.

CONCLUSION Neovascularisation seems to be the most common anatomical presentation of varicose vein recurrence, especially in patients treated with HL&S. In patients previously treated with EVTA, newly formed incompetence of the AASV after ablation of the GSV is an important cause of recurrence.

Submitted for the EVF Prize.
2.4 CHORUS: CHRONIC VENOUS AND HEMORRHOIDAL DISEASES EVALUATION AND SCIENTIFIC RESEARCH RESULTS OF AN INTERNATIONAL OBSERVATIONAL SURVEY

Parvez Sheikh1, Evgeny Zagryadsky2, Varut Lohsiriwat3, Abel Jalife Montano4, Pavle Korosok5, Heiko De Schepper6

1 Department of Colorectal Surgery, Saifee Hospital, Mumbai, India
2 Medical Center «ON-CLINIC», Moscow, Russia
3 Department of Surgery, Faculty of Medicine Siriraj hospital/Mahidol University, Bangkok Thailand
4 Department of General Surgery, General Hospital of Mexico, Mexico City, Mexico
5 Medicinski Center IATROS, Ljubljana, Slovenia
6 Department of Gastroenterology and Hepatology, Antwerp University Hospital, Edegem, Belgium

AIM CHORUS was an international, observational, multicenter survey performed in the framework of routine consultations in patients with hemorrhoidal disease (HD), to determine the frequency and nature of complaints and to assess the possible concomitance between hemorrhoids and chronic venous disorders (CVD).

MATERIALS AND METHODS The program was performed in 7 countries (Thailand, India, Russia, Pakistan, Belgium, Slovenia, Mexico) between 2015 and 2016; involved adult outpatients consulting general practitioners or specialists (mainly proctologists) with complaints of hemorrhoids. Patient’s baseline characteristics, history of bowel disorders, diagnosis of concomitant CVD, presence of hemorrhoids by clinical exam and type of prescribed treatment were recorded using a case report form.

RESULTS A total of 9381 subjects were enrolled, of whom 5617 (men 54%; women 46%) had complete data for main variables and were the focus of the results reported here. Mean age was 45±14 years and mean BMI was 26.7±5 kg/m². Pain (67%), bleeding (72%), swelling (55%), itching (44%) and prolapse (36%) were the most frequently encountered complaints. In almost all patients (98.5%) consulting spontaneously for hemorrhoids, this diagnosis was confirmed by the physician (29%, 43%, 23%, 5% in grades I, II, III, IV respectively). 56% of the patients had recurrent HD. Among patients consulting for hemorrhoids, 51% presented with CVD at the same time (19% were C0s, 29% C1, 25% C2, 16% C3 and 10% C4-C6 according to Clinical Etiological Anatomic Pathophysiologic (CEAP) classification). In patients with HD in grades I, II, III, IV the proportion of patients with CVD was 43%, 54%, 55%, 58% of cases respectively, clearly increasing with the severity of HD. In patients with recurrent HD, the proportion of patients with CVD was significantly higher than in those with no recurrent HD (58% versus 43%, respectively), suggesting a link between the recurrence of hemorrhoids and the presence of concomitant venous leg problems. 99.75% of the patients were prescribed at least one treatment. This was a veno-active drug in 94% of the cases (mainly micronized purified flavonoid fraction, 93%), diet with fibers in 71%, topical cream in 70%, pain killers in 26% and surgery in 23% of the patients.

CONCLUSION CHORUS provided an overview of patients’ characteristics and hemorrhoids management in clinical practice from different geographical zones worldwide, while suggesting for the first time a correlation between hemorrhoids and CVD. More than half of the patients with HD presented with CVD. The proportion of patients with CVD increased with the severity and the recurrence of HD, highlighting the importance of investigating the signs of CVD in this patient population during daily practice.
3.1 COMPRESSION STOCKINGS IN THE PREVENTION OF VENOUS DISORDERS IN PREGNANCY

Dragan Milic¹, Sasa Zivic², Dragan Bogdanovic³, Milan Jovanovic⁴

¹ Clinic for Cardiovascular and Transplant Surgery, Clinical Centre of Nis, Nis, Serbia and Medical School University of Nis, Nis, Serbia
² Clinic for Cardiovascular and Transplant Surgery, Clinical Centre of Nis, Nis, Serbia
³ Institute for Public Health, Nis, Serbia
⁴ Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia & Medical School University of Nis, Nis, Serbia

Aim

Pregnant women are 4- to 5-fold more susceptible to venous thromboembolism (VTE) than non-pregnant women. There are two basic mechanisms that lead to VTE and chronic venous disease (CVD) in pregnancy: effect of hormonal mediators on venous distensibility and the compression of the inferior vena cava and iliac veins by the gravid uterus. These two mechanisms lead to increase in venous pressure of the legs. Published data report that 15-25% of pregnant women develop varicose veins during pregnancy. It is also reported that maternal death rate in undeveloped countries may be as high as 2% due to VTE in pregnancy. Most reports indicate that VTE occur more often in the first half of pregnancy. Although compression stockings are recommended by many guidelines, there are limited data concerning its efficacy in the prevention of CVD and VTE during pregnancy.

The aim of this study was to establish the efficacy of compression hosiery (Class 1 and Class 2) in the prevention of chronic venous disease and venous thromboembolism in pregnant women.

Materials and Methods

An open, prospective, randomized, single-center study was performed. One hundred and forty six pregnant women (mean age 25 years) in fetal gestation between 6-10 weeks and no visible or palpable signs of venous disease, no previous history of venous disorders and normal color Duplex scan vein examination were randomized in three groups:

- Group A) 46 pregnant women wearing compression hosiery Class 1;
- Group B) 49 pregnant women wearing compression hosiery Class 2;
- Group C) 51 pregnant women with no compression.

Pregnant women in group A and B were instructed to wear compression stockings during the day. One pair of elastic stockings was changed after four months. The main outcome measures were: incidence of varicose veins and incidence of superficial thrombophlebitis and deep vein thrombosis.

Results

Overall 121 pregnant women completed the trial. Drop-out rate, due to non-compliance, was 11 pregnant women in group A (23.91%) and 15 in group B (30.61%). Only one pregnant women had a superficial thrombophlebitis in group C (1.96%) (P=ns among study groups). Incidence of varicose veins was 14 pregnant women in group C (27.45%), 3 in group B (8.82%) and 5 (14.28%) in group A (P<0.05 for groups A and B compared to group C, and p=ns for groups A and B).

Conclusion

The results obtained in this study suggest that compression hosiery may reduce 2- to 3-fold incidence of varicose veins in pregnant women.
AIM Micronized purified flavonoid fraction (Daflon®) is a venoactive agent with proven positive effects in the treatment of chronic venous disease. The aim of our study was to assess its clinical efficacy in the postoperative symptoms after endovenous thermal ablation associated with phlebectomies.

MATERIALS AND METHODS Forty two patients undergoing endovenous thermal ablation (laser 1470nm or radiofrequency) of the greater saphenous vein associated with phlebectomies were randomized in those (21 patients) receiving Daflon 500mg Bid 7 days before and 30 days after the procedure (Daflon group) and in those (21 patients) who did not receive Daflon (Control group). Clinical classification (CEAP), CEAP clinical score, 10-cm Visual Analog Scale (VAS) for pain, Venous Clinical Severity Score (VCSS) and Chronic Venous Insufficiency Quality-of-Life Questionnaire (CIVIQ) were recorded. Assessment visits were performed 7 days prior to ablation and 7 and 30 days post-ablation. Primary outcome was postoperative pain using the VAS scale and CIVIQ pain score. Secondary outcomes were improvement of CEAP clinical, VCSS and CIVIQ scores.

RESULTS Patients’ demographics, CEAP classification, type of ablation (EVLA or RF), mean linear endovenous energy density, average vein diameter and length of ablated vein were comparable between the two groups. Mean preoperative VAS pain score and CIVIQ pain score were 5.7 and 10.2 in the Daflon and 5.7 and 9.8 in the control group while at 7-day post-operatively there was improvement in both groups (2.7 VAS pain score and 6 CIVIQ pain score in the Daflon vs. 3.5 and 7.4 in the control group, respectively), (P<0.05). At 7-day postoperatively the Daflon group had better outcome compared to the control one in the CIVIQ pain score (from 10.2 to 6 vs. from 9.8 to 7.4) (P<0.05). At 30-day postoperatively all patients showed a significant improvement in all domains compared to postoperative assessment (P<0.05), but there were no differences between the two groups.

CONCLUSION Daflon in patients undergoing endovenous thermal ablation may improve early postoperative pain. Larger studies are needed to confirm these findings.

Submitted for the EVF Prize.
3.3 MANAGEMENT OF ANTERIOR ACCESSORY OF THE GREAT SAPHENOUS VEIN

Johann Chris Ragg, Krastina Stoyanova
Angioclinic Vein Centers, Berlin, Germany

AIM  In today’s endovenous approaches, the GSV is ablated with a “safety distance” to the junction, sparing all other branches and thus leading to a considerable number of recurrences, in particular consecutive AAGSV insufficiencies. In consequence additional treatments are required – potentially more frequent than after surgical crossectomy. Should ablation of non-refluxive AAGSV be routinely included, or are technical modifications required? A prospective randomized trial was performed to clarify the conditions for distinguished AAGSV strategies.

MATERIALS AND METHODS  240 consecutive patients with GSV insufficiency (C2-C6; d=6.5-17.8), reflux origin from the SFJ (destroyed or malfunctioning terminal valve), non-refluxive AAGSV and no other refluxive branch of SFJ were selected for endovenous laser ablation (EVLA, 1470 nm, radial, 50-80 J/cm). Cases were randomized to two groups, A) EVLA starting at femoral vein level (“laser crossectomy”), or B) GSV EVLA starting below epigastric vein (EV) junction. Both procedures were combined with ultrasound-guided coaxial perivenous local anesthesia (CPLA). Ultrasound follow-up was performed after 1 day and after 1, 6, 12 and 24 months.

RESULTS  GSV occlusion was obtained in all cases, but with different morphology: Laser crossectomy (group A) showed no stump (88/120, 73.3%), minor stumps <5 mm (14/120, 11.7%) or moderate stumps (5-17 mm, mean 11.5 mm, 18/120, 15%, at 1 month exam); 118/120 (98.3%) entries of AAGSV were covered. In group B, GSV vein stumps of 8-31 mm length, mean 23 mm, were present in 120/120 cases. AAGSV entry was covered in 13/120 cases (10.8%). Within 2 year follow-up, AAGSV insufficiency was detected in 5/120 cases (4.2%) of group A and 26/120 (21.7%) of group B (P >0.01). Just 1/120 (A) resp. 6/120 (B) cases were clinically relevant.

CONCLUSION  Consideration of AAGSV anatomy is crucial for the right choice of strategy. «Laser crossectomy», even if attacking just the GSV, is more effective in preventing secondary AAGSV reflux than techniques leaving stumps. Further studies will have to detect factors of AAGSV vulnerability, like diameter or previous phlebitis, to consider primary ablation in selected cases.
3.4 SURGERY VERSUS FOAM SCLEROTHERAPY IN PATIENTS WITH ISOLATED ANTERIOR ACCESSORY SAPHENOUS VEIN VARICOsis: A RANDOMIZED CLINICAL STUDY
Stanislava Tzaneva, Sabine Stolkovich, Harald Kittler, Kornelia Böhler
University Clinic of Dermatology, Medical University of Vienna, Austria

AIM Isolated varicosis of the anterior accessory saphenous vein (AASV) resulting from valvular incompetence at the saphenofemoral junction leading to reflux into the AASV but preserving the great saphenous vein (GSV) is not uncommon in daily clinical practice. In the literature evidence concerning patients with this condition is poor. The aim is the comparison of two therapeutic regimes: crossectomy and avulsion of the varicose AASV under local anesthesia versus foam sclerotherapy of the AASV.

MATERIALS AND METHODS In this prospective randomized study 40 consecutive outpatients were randomized either to the surgery group or to the sclerotherapy group. Follow-up was performed 1 and 3 years after intervention. Re-treatment with foam sclerotherapy was permitted at the first follow-up after 1 year. The main outcome measure was duplexsonographic recurrence after 3 years, defined as reverse blood flow of >0.5 s along the AASV in the sclerotherapy group or in new anterior thigh varicosities connected to the previous saphenofemoral junction (NATV) in the surgical group. Secondary outcomes were duplexsonographic recurrence in the AASV or NATV after 1 year, clinical recurrence as well as neovascularisation in the sapheno-femoral junction after 1 and 3 years.

RESULTS 38 patients (5 males and 33 females) completed the study: 20 in the sclerotherapy group and 18 in the surgery group. After 1 year significantly more patients in the sclerotherapy group revealed duplexsonographic recurrence compared to the surgery group (50% vs. 16%) (fisher exact test, P=0.029). However, if only clinical recurrence was considered this difference was less (35% vs. 16%, fisher exact test, P=0.21).

After 3 years duplexsonographic recurrence was revealed in 52% of the patients treated with sclerotherapy versus 22% of the patients treated with surgery, but this difference did not reach statistical significance (fisher exact test, P=0.165). After 3 years clinically relevant recurrences were equally distributed among both groups: 35% in the sclerotherapy versus 22% in the surgery group (fisher exact test, P=0.75).

Neovascularisation at the groin occurred only after surgery: in 26% of the patients after 1 year (fisher exact test, P=0.018) and in 33% after 3 years (fisher exact test, P=0.014).

CONCLUSION Surgery was better than sclerotherapy in elimination of reflux in patients with isolated AASV varicosis after 1 and 3 years, but the difference was only after 1 year statistically significant. If re-treatment with sclerotherapy was performed and/or only clinical recurrence was considered sclerotherapy was comparable to surgery after 3 years.
4.1 VALIDATION OF THE 3D SYM VEIN SYMPTOM ASSESSMENT TOOL

Chrysanthi Papageorgopoulou, Stavros Kakkos, Konstantinos Nikolakopoulos, Ioannis Ntouvas, Spyros Papadoulas, Ioannis Tsolakis
Vascular Surgery Department, University Hospital of Patras, Patras, Greece

AIM There is an unmet need for a disease-specific symptom scoring tool in patients with chronic venous disease (CVD). The SYM VEIN consensus statement has recently proposed a three-dimensional (3D) system that takes into account not only symptom severity, but also individual frequency and daily course (sum of the three attributes, each graded on a 0-3 scale, for a maximum of 9 points).

The aim is to prospectively validate the SYM VEIN consensus 3D scoring tool in patients with CVD undergoing saphenectomy and compare it with established outcome measures.

MATERIALS AND METHODS Patients with CVD undergoing saphenectomy were assessed preoperatively using the revised Venous Clinical Severity Score (r-VCSS), the CIVIQ questionnaire of life (validated Greek version), and the 3D score (for each individual symptom and in the form of a total of each score), preoperatively and at four weeks postoperatively. We assessed the symptoms of pain or aching, heaviness, sensation of edema, burning pain, cramps, restless legs, paresthesia, throbbing pain and pruritus and performed principal component analysis of the 3D scores to identify highly inter-correlating variables and groups of symptoms. Finally, we performed multiple regression to identify independent symptoms as predictors of quality of life.

RESULTS A total of 31 consecutive patients with CVD (20 females, mean age 55 years, CEAP clinical class range 2-6) were included in the present study. 3D scores of the symptoms, r-VCSS and CIVIQ score are shown in the Table. Median r-VCSS was reduced from 6 to 0 (100% decrease, P<0.001), total 3D score was reduced from 29 to 5 (82% decrease, P<0.001), and CIVIQ score was reduced from 24 to 15 (26% decrease, P<0.001). The difference of median percentage changes between VCSS and total 3D score was significant (P=0.006). Principal component analysis identified three groups of symptoms that showed high intragroup correlation. The first one included aching, burning pain, cramps and sensation of edema, the second one restless leg and throbbing pain and the third one paresthesia. Multiple regression identified cramps and heaviness as independent predictors of the CIVIQ quality of life score, P=0.009 and 0.017, respectively.

CONCLUSION This is the first validation of the SYM VEIN consensus 3D scoring tool in patients with CVD. The total 3D score is less prone to change after saphenectomy compared to r-VCSS, possibly a result of better ability to score residual symptoms. Larger studies are required to assess the intercorrelation of venous symptoms and their effect on quality of life (Table I).
Table I. 3D Scores for individual SYMVEIN symptoms and r-VCSS and CIVIQ scores.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Preoperative score [median (IQR)]</th>
<th>Preoperative score [median (IQR)]</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aching/pain</td>
<td>6 (3-7)</td>
<td>0 (0-3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Heaviness</td>
<td>3 (0-3)</td>
<td>0 (0-0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cramps</td>
<td>6 (3-6)</td>
<td>0 (0-3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sensation of edema</td>
<td>6 (2-6)</td>
<td>0 (0-2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Burning pain</td>
<td>4 (3-6)</td>
<td>0 (0-3)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Paresthesia</td>
<td>3 (0-5)</td>
<td>0 (0-0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Restless legs</td>
<td>0 (0-0)</td>
<td>0*</td>
<td>0.32</td>
</tr>
<tr>
<td>Throbbing pain</td>
<td>0 (0-0)</td>
<td>0*</td>
<td>0.08</td>
</tr>
<tr>
<td>Pruritus</td>
<td>3 (3-6)</td>
<td>0 (0-0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>r-VCSS</td>
<td>6 (5-7)</td>
<td>0 (0-1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CIVIQ</td>
<td>24 (19-29)</td>
<td>15 (14-15)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* IQR not estimable.

Submitted for the EVF Prize.
### 4.2 EFFECT OF TREADMILL EXERCISE ON CALF HAEMODYNAMICS

Christopher Lattimer¹, Evi Kalodiki¹, Erica Menegatti², Sergio Gianesini³

¹Josef Pflug Vascular Laboratory, Ealing Hospital and Imperial College and West London Vascular and Interventional Centre, UK
²Vascular Diseases Center, University of Ferrara, Cona, Ferrara, Italy
³Vascular Diseases Center, University of Ferrara, Cona, Ferrara, Italy and USUHS University, Bethesda, USA

**AIM** There are 2 pertinent publications on the effect of exercise on air-plethysmography (APG) parameters. One study on patients (n.=10 legs) with varicose veins measured changes during walking using the residual volume fraction (RVF). Unsurprisingly, there was no difference between tip-toe movements standing versus treadmill walking. Another study examined the effect of exercise in 10 runners. There was a mild increase in the venous filling index (VFI) which was reduced significantly with a knee-length medical compression stocking (MCS). They concluded incorrectly that compression produced a haemodynamic improvement. The effect of exercise on the venous drainage index (VDI) has never been examined.

The aim of this study was to examine the effect of strenuous treadmill walking on the VFI and VDI of APG. These tests measure calf volume changes in mL/s during gravitational manoeuvres: dependent filling and elevation drainage.

**MATERIALS AND METHODS** The legs of 30 conference participants (n.=30 legs; 20 male; 29 right) were tested over 3 days. Median (inter-quartile range) age: 36 (30-51) years; BMI: 23.3 (18.7-32.6). Clinical CEAP was: C₀=20; C₁=4; C₂=2; C₃=4. The VFI and VDI were performed initially after 10 minutes of supervised rest in a reclining chair and then immediately after treadmill exercise. Participants were instructed to walk for 5 minutes with the treadmill at 5 degrees inclination and speed at 6 Km/h. The impulse amplitude was measured before and after exercise using the height of the cardiac pumping beat observed on the APG tracing.

**RESULTS** There was a significant increase in the VFI and the impulse amplitude of the APG tracing following exercise (Table I). No changes were observed in the VDI or the working venous volume (wVV) from leg dependency to elevation.

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>IQR</th>
<th>Range</th>
<th>P (Wilcoxon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre VFI (mL/s)</td>
<td>1.1</td>
<td>0.6-2.5</td>
<td>0.1-4.6</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Post VFI (mL/s)</td>
<td>2.7</td>
<td>1.9-6.3</td>
<td>0.5-28.6</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Pre VDI (mL/s)</td>
<td>17.7</td>
<td>13.5-28.7</td>
<td>3.8-55.2</td>
<td>0.704</td>
</tr>
<tr>
<td>Post VDI (mL/s)</td>
<td>19.0</td>
<td>14.9-28.3</td>
<td>9.7-73.7</td>
<td>0.704</td>
</tr>
<tr>
<td>Pre wVV (mL)</td>
<td>101.3</td>
<td>73-144.9</td>
<td>17.3-207.7</td>
<td>0.057</td>
</tr>
<tr>
<td>Post wVV (mL)</td>
<td>96.8</td>
<td>66.6-123.8</td>
<td>49-157.8</td>
<td>0.057</td>
</tr>
<tr>
<td>Pre amplitude (mL)</td>
<td>1.7</td>
<td>1.3-2.1</td>
<td>0.5-2.7</td>
<td>0.057</td>
</tr>
<tr>
<td>Pre amplitude (mL)</td>
<td>2.6</td>
<td>2.1-3.4</td>
<td>0.7-4.5</td>
<td>&lt;0.0005</td>
</tr>
</tbody>
</table>
CONCLUSION An increase in the VFI after exercise is a normal physiological change and should not be interpreted as harmful reflux. This phenomenon is likely to result from an increase in the arterial inflow into the calf from the exercise. The lack of significant change in the VDI post exercise is expected because it is the rate of calf decompression from a falling column of venous blood. This information may be useful clinically to exclude deep venous obstruction, provided the VDI remains unchanged after exercise. This principle is similar to the arterial ankle-brachial pressure index (ABPI) where lack of decrease indicates a normal arterial supply. The present investigation is the largest series to date demonstrating venous patho-physiology with APG after cardiovascular exercise.
4.3 A NEW RISK ASSESSMENT MODEL BETTER PREDICTS VENOUS THROMBOEMBOLISM RISKS IN ASIAN SURGICAL PATIENTS

Lim Li, Ngoh Chin Liew, Ping An Teh, Yan Jun Teoh
Department of Surgery, University Putra Malaysia, Malaysia

**AIM** Incidence of venous thromboembolism (VTE) in Asia is lower than in Western countries. The lower incidence may be due to ethnicity with genetic differences or secondary to environmental risk factors such as obesity, lifestyle and diet. Caprini risk assessment model (RAM), validated in mostly Caucasian population may not be applicable to Asians. We have developed a simplified VTE RAM with different emphasis and weightage on the known Asian risk factors. The efficacy of this new RAM in predicting VTE risks is compared with Caprini’s RAM.

**MATERIALS AND METHODS** The electronic records of 9513 patients aged 18 years and above admitted to surgical, gynaecological and orthopaedic wards of a district General Hospital between 1 January 2013 and 31 December 2015 were reviewed. Non-Asian patients such as Caucasians, Middle Easterners and Africans were excluded. VTE risk of each of the patient was assessed with both new VTE and Caprini RAM. Medical records were reviewed for VTE risk factors and evidence of symptomatic VTE during hospital admission and within 90 days after discharge. Descriptive analysis of individual risk factors, overall VTE incidence and incidence of VTE in each risk category was performed. Association between each risk factors and incidence of VTE was analysed using Chi-square or Fisher's exact test.

**RESULTS** The overall symptomatic VTE incidence was 0.5%. Incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE) were 0.3% and 0.2% respectively. In each risk levels of Caprini RAM, the incidence were 0% in very low, 0.14% in low, 0.57% in moderate and 2.32% in high categories. Using the new VTE RAM, VTE incidences were 0.08%, 1.17% and 3.79% in low, moderate and high risk categories respectively. The risk factors significantly associated with VTE were obesity, varicose veins, minor surgery, age more than 40, immobility, malignancy, history of DVT/PE and thrombophilia.

**CONCLUSION** The overall VTE incidence among Asian patients was much lower than the incidence reported in a similar retrospective hospital discharge study in Michigan as reported by Bahl et al. Based on our study, Caprini RAM over predicted VTE risk compared to the new VTE RAM in moderate and high risk categories. This preliminary study showed that the new VTE RAM better predicts VTE risk among Asian surgical patients.

Submitted for the EVF Prize.
4.4 PRESENTATION PATTERNS AND PROGNOSIS OF 109 ISOLATED VENOUS INJURIES IN 99 PATIENTS

Stavros Kakkos¹, Ioannis Tsolakis¹, George Markopoulos², Ioannis Maroulis², Efstratios Koletsis¹, Fotini Fligou⁴, Konstantinos Panagopoulos², Spyros Papadoulas¹, George Lambropoulos¹, Ioannis Ntouvas¹, Konstantinos Nikolakopoulos¹, Chrysanthi Papageorgopoulou¹, Anastasia Kouri¹
¹ Department of Vascular Surgery, University of Patras, Patras, Greece
² Department of Surgery, University of Patras, Patras, Greece
³ Department of Cardiothoracic Surgery, University of Patras, Patras, Greece
⁴ Department of Anaesthesiology and Intensive Care Medicine, University of Patras, Patras, Greece

AIM Venous injuries (VIs) are relatively rare albeit known for their potentially high mortality in not treated on an expedited manner. The aim is to study presentation and management patterns, and identify factors associated with prognosis of isolated VIs.

MATERIALS AND METHODS Patients with isolated VIs were identified from a dedicated vascular trauma database. Concomitant arterial and venous injuries were excluded. We recorded patient demographics, mechanism, type and exact location of each VI, coexisting venous and non-venous injuries, and mortality (total and related to the VI). We also investigated the association between patient or injury characteristics and mortality.

RESULTS A total of 99 patients with 109 isolated VI managed between 1990 and 2017 (30 females, median age 65 years) were included; 10 patients had two distinct veins affected. Surgical oncology was the cause in 35 patients, vascular or cardiac surgery in 34 patients, or other open procedures in 10 patients, (classified as internal causes, n.=79), and trauma in eight patients or endovenous procedures mainly related to catheters in 12 patients, which included foreign body retention in six patients (classified as external causes, n.=20). Vessel transection and vein laceration or tear was identified in 15 and 78 patients, respectively. In 91 cases the VI was iatrogenic. Affected veins included the inferior (n.=17) or superior (n.=3) vena cava, the innominate (n.=5) or subclavian (n.=4) vein, the iliac veins (n.=19), the inferior (n.=3) or superior (n.=7) mesenteric vein, the renal vein (n.=10), the portal (n.=8) or splenic (n.=7) vein, various limb veins (n.=8), the internal jugular vein (n.=5) and other named veins (n.=3). Primary repair was performed more frequently (n.=67), followed by ligation (n.=20) or ligation/splenectomy (n.=2). Primary anastomosis or PTFE graft interposition was performed in two cases, respectively. Two patients with inferior vena cava injury after a road traffic accident died on table before a definite management. Total mortality was 18/99 (18%), which was higher in males (23% vs. 6.7% for females, P=0.05), elderly patients, caval VIs (35% vs. 14% for other VIs, P=0.048), and external causes (35% vs. 14% for internal causes, P=0.048). Mortality related to the VI was 10/99 (10%), which was higher in non-iatrogenic trauma (38% vs. 7.7% for iatrogenic trauma, P=0.032), and external causes (33% vs. 3.8% for internal causes, P<0.001).

CONCLUSION VIs of the vena cava or due to external causes – trauma and foreign body retention – are associated with a high mortality rate, which prompts for measures to reduce it. On the other hand, iatrogenic injuries due internal causes – during a surgical procedure – are managed promptly and have a very low mortality related to the VI.
5.1 TIME OF ANTICOAGULANT TREATMENT INITIATION AND SEVERITY OF POSTTHROMBOTIC SYNDROME IN PATIENTS WITH DEEP VEIN THROMBOSIS: PROSPECTIVE OBSERVATIONAL STUDY

Dumitru Casian, Vasile Culiuc, Marcel Sochirca, Evghenii Gutu
Department of General Surgery, State University of Medicine and Pharmacy “Nicolae Testemitanu”, Chisinau, Moldova

AIM Postthrombotic syndrome (PTS) represents the most common sequelae of deep vein thrombosis (DVT) of lower limbs, diagnosed in up to 60% of cases. The occurrence of PTS is considered to be influenced by a number of factors. The purpose of study was to find out how the promptness of initiation of anticoagulation for patients with DVT affects the rate and severity of PTS.

MATERIALS AND METHODS We retrospectively reviewed the prospectively collected data of 102 patients with DVT of lower limbs; male – 60 (58.82%); mean age (±SD) – 55.3±13.7 years. Diagnosis has been confirmed in all cases by Duplex scanning; DVT being assigned to classes II (n.=55; 53.9%), III (n.=36; 35.2%) or IV (n.=11; 10.7%) in accordance with the Lower Extremity Thrombosis (LET) classification. All patients were treated by administration of low molecular weight heparins with subsequent conversion to vitamin K antagonists. Initiation of therapy was done as soon as patients were hospitalized. The time elapsed from the onset of clinical manifestations of thrombosis to the start of treatment ranging from 1 hour to 504 hours. At 5-years (25%-75% IQR=3-8) follow-up evaluation Villalta score was calculated for each affected limb. Subsequently, the promptitude of initiation of anticoagulant treatment was analyzed and compared between patients with and without PTS.

RESULTS There were 53 (51.9%) limbs with no PTS (0-4 points); 16 (15.6%) – with mild PTS (5-9 points); 18 (17.6%) – with moderate PTS (10-14 points) and 15 (14.7%) – with severe PTS (≥15 points). Moderate positive correlation (r=0.53) was identified between the time of initiation of anticoagulant treatment and value of Villalta score. In patients without PTS at follow-up, treatment was initiated faster than in those with moderate PTS: 72 (25%-75% IQR=72-96) hours vs. 96 (25%-75% IQR=72-168) hours from the onset of DVT (P=0.06). In the group with severe PTS there was a significant delay in initiation of treatment – 204 (25%-75% IQR=60-336) hours, (P<0.0001, comparing to non-PTS group). Median time interval till the start of anticoagulation was not significantly different in patients with and without PTS, if index DVT event was classified as LET II class. However, mentioned difference has reached the statistical α level in case of LET III-IV class DVT: 96 (25%-75% IQR=72-204) hours vs. 72 (25%-75% IQR=48-120) hours.

CONCLUSION The delay in initiation of anticoagulant therapy for more than 72 hours after the onset of DVT can increase the rate of severe PTS cases, especially in patients with iliocaval venous thrombosis. Prompt administration of therapeutic anticoagulation should be appraised as a factor that could reduce the frequency and severity of PTS.
5.2 DETERMINATION OF A VENOUS THROMBUS AGE WITH A NEW ULTRASOUND SIGN

Nicos Labropoulos, Anirudh Chandrashekar, Singh Gurtej, Nicholas Sikalas, Antonios Gasparis
Stony Brook Medicine, Stony Brook, NY, USA

AIM To describe a new ultrasonographic diagnostic sign of acute vein thrombosis.

MATERIALS AND METHODS In patients with an acute thrombosis a double line was observed along the thrombus/wall interface. Prospective evaluation of the smooth double-line sign was performed in the current study in patients with acute thrombosis with signs and symptoms of less than 1 week (n.=200), in high risk asymptomatic patients (n.=75), in limbs with recurrent thrombosis (n.=50), and in those with chronic post-thrombotic luminal changes (n.=50). Patients with line placement who developed thrombosis around the line within one week were examined as well (n.=40). The high risk asymptomatic patients (total hip replacement n.=25, total knee replacement n.=25, neurosurgery n.=25) had the ultrasound performed within the first week from surgery. Duplex ultrasound was used with routine multifrequency linear array transducers. In superficial vein thrombosis a 17 MHz linear array transducers were used to study this sign in ideal conditions of imaging. More recently intravascular ultrasound was also used in patients with acute and chronic changes that underwent endovenous treatment.

RESULTS The smooth double line pattern was detected in several locations in 186 patients with acute thrombosis. In another 11 it was found after enhancing the image and in 3 was not identified. There were 63 limbs with acute superficial vein thrombosis with or without line placement and the sign was present in all but one limbs. In the high risk asymptomatic patients, the sign was present in 68 limbs. Seven patients had small nonocclusive thrombi and in those the sign was not clear. In patients with recurrent thrombosis the sign was clear in 38, questionable in 7, and absent in 5. In patients with chronic luminal changes, the echogenic lines were occasionally seen at the wall, but appeared irregular and easily distinguishable from those with the acute thrombosis. The smooth double line pattern was clearly detected in patients with acute thrombosis by intravascular ultrasound that easily separate it from chronic changes.

CONCLUSION A smooth hyperechoic double line at the interface between the thrombus and the wall of the vein by ultrasound scanning is a clear diagnostic sign of a recently formed thrombosis. This finding may assist in determination of the age of a thrombus, and, therefore, distinguish relatively fresh from older thrombi and detect recurrent thrombosis in the vast majority of patients.
5.3 INCREASED RISK FOR RECURRENT THROMBOEMBOLIC EVENTS DURING THE FIRST THREE MONTHS IN PATIENTS WITH SUPERFICIAL VEIN THROMBOSIS TREATED WITH TINZAPARIN

Konstantinos Nikolakopoulos, Stavros Kakkos, Chrysanthis Papageorgopoulou, Ioannis Ntouvas, Spyros Papadoulas, Ioannis Tsolakis
Vascular Surgery Department, University Hospital of Patras, Patras, Greece

AIM There is scarce information in the literature on the incidence and risk factors for recurrent thromboembolic events (RTEs) in patients with superficial vein thrombosis (SVT). The aim is to identify risk factors for short-term RTEs and report on long-term risks for RTEs in patients with SVT treated with tinzaparin.

MATERIALS AND METHODS The composite primary endpoint was a RTE, defined as the occurrence of a clinically evident SVT recurrence, deep-vein thrombosis (DVT) and/or pulmonary embolism (PE). Patients were stratified into group A, where patients received a variable dose of tinzaparin for up to 60 days (n.=98), and a subsequent group B-ext, where patients received a standardized intermediate dose of tinzaparin (75% of the therapeutic, i.e. 131 IU/kg, n.=49) for 90 days.

RESULTS A total of 147 consecutive patients with significant SVT (thrombus length ≥5 cm and at least 3cm away from the saphenofemoral junction), treated with subcutaneously administered tinzaparin. RTEs occurred in 15/147 patients (10.2%), including recurrent SVT (n.=10), DVT (n.=4) and fatal PE (n.=1). RTEs were less frequent in group B-ext (0% versus 15.3% for group A, P=0.004). RTE predictors at 120 days in group A included clinically extensive SVT (i.e., involving both calf and thigh, P=0.037) and the ultrasound finding of superficial axial (great and/or small saphenous) vein thrombosis (P=0.008), but no other factors including tinzaparin dose or duration of treatment, or the presence of a SURPRISE RCT risk factor. Clinically extensive SVT (HR 5.94, P=0.001) and difficulty moving the leg (HR 5.87, P=0.024) were the only independent predictors of RTEs on Cox regression. Predictors or DVT or PE at 120 days in group A included clinically extensive SVT (P=0.004), absence of local pain (P=0.023) and the ultrasound findings.

Figure 1.
of superficial axial vein thrombosis (any, P=0.006 or isolated, P=0.036) and multiple thrombosed superficial venous sites (P<0.001). During the one-year follow up, five additional RTEs occurred, including two cases of DVT (one of them was a calf DVT early after stripping) and three cases of SVT (on the ipsilateral side, n.=1, and the contralateral side, n.=2). RTE rates were still numerically fewer in group B-ext (4.1% versus 18.4% for group A, P=0.017, Figure 1). No patients were lost to follow-up.

**CONCLUSION** An extended three-month regimen of tinzaparin in patients with SVT of the lower limbs is more effective than a shorter course and may be particularly desirable in patients with risk factors for recurrence, including superficial axial vein thrombosis. After an initial period of three months the risk for RTEs subsides, although some residual risk associated with the continuing presence of venous stasis and varicose veins was observed.
5.4 JUST-IN-TIME: IMPORTANCE OF EARLY DUPLEX SURVEILLANCE FOLLOWING DEEP VENOUS STENTING FOR THE TREATMENT OF POST-THROMBOTIC SYNDROME

Adam Gwozdz, Prakash Saha, Justinas Silickas, Leonardo Jones, Taha Kahn, Lawrence Stephenson, Anna L. Pouncey, Oscar Johnston, Ash S. Patel, Soundrie Padayachee, Alberto Smith, Stephen A. Black
Academic Department of Vascular Surgery, School of Cardiovascular Medicine and Science, St Thomas’ Hospital, King’s College London, UK

AIM Endovascular treatment of post-thrombotic syndrome using nitinol venous stents is associated with symptomatic improvement, but ~40% will require re-intervention. Our approach to maintain stent patency has been through close surveillance to intervene before stent occlusion. There is, however, limited data on the efficacy, interval and duration of ultrasound surveillance following deep venous reconstruction. The aim of this study was to examine whether ultrasound surveillance was sensitive for re-intervention, and to investigate whether it was possible to predict which patients had the greatest risk of re-intervention.

MATERIALS AND METHODS Consecutive patients in whom a venous stent was inserted for symptomatic occlusive post-thrombotic disease between 2012 and 2017 were included for analysis. Stent patency was assessed using Duplex ultrasonography 24 hours, 2 weeks, 6 weeks, 3 months, 6 months, 1 year, and yearly post intervention. The maximum in-stent stenosis was calculated, with re-interventions performed when there was a stent diameter reduction of >50%. Patient demographics were collected to determine which factors were associated with re-intervention.

RESULTS Of 194 patients treated in our venous programme during the study period, cumulative patency was 86%. However, 79 (41%) patients required re-intervention to maintain patency, of which 40/79 (51%) occurred within 3wks of their procedure. Stenting across the inguinal ligament was associated with a higher risk of early re-intervention (HR 1.817; P=0.048, 95% CI [1.005, 3.285]). Re-interventions immediately followed ultrasound surveillance in 70/79 (87%) cases, and this was driven by scan results rather than symptom change. From this group, 13/79 (17%) required only a single re-intervention, while 16/79 (20%) required more than 3 re-interventions (range 1-6). At 6 weeks, maximum in-stent stenosis <30% was a strong predictor of being low risk for re-intervention at 6 months (HR 0.038; P=0.003, 95% CI [0.004, 0.322]). Conversely, patients with a maximum in-stent stenosis between 30-50% at 6wks were at high risk of requiring re-intervention at 6mths (HR 29.90; P=0.002, 95% CI [3.519, 253.989]).

CONCLUSION Ultrasound surveillance is an important component of deep venous stenting, and should occur at frequent intervals up to 3 weeks post procedure. Ultrasound surveillance at 6 weeks could be used to differentiate between patients that require further surveillance before 6 months. These may include patients with maximum in-stent stenosis between 30-50% at 6 weeks and patients with stents crossing the inguinal ligament.

Submitted for the EVF Prize.
EARLY IDENTIFICATION OF PATIENTS WITH HIGH RISK FOR ILIO-FEMORAL DVT

Nizar Hariri¹, Brian Kaminski², Michael Mattin², John Fish¹, Gregory Kasper¹, Fedor Lurie³
¹ Jobst Vascular Institute, Toledo, Ohio, USA
² ProMedica Health System, Toledo, Ohio, USA
³ Jobst Vascular Institute and University of Michigan, Ann Arbor, USA

AIM Current guidelines recommend risk stratification of patients with suspected deep vein thrombosis (DVT) using clinical decision rule, such as Well’s score, and D-dimer level. This strategy resulted in early anticoagulation and a delay in imaging tests in high risk patients. At the same time, a specific management of patient with confirmed DVT depends on the anatomical location of the thrombus. Early identification of anatomical location of the thrombus (ileofemoral (IF), femoropopliteal (FP), or calf (C)) can expedite appropriate investigation and treatment of IF DVT, and optimize management strategy for FP and C DVT. The aim of this study was to investigate a possibility to identify the anatomical location of DVT using existing risk stratification instruments.

MATERIALS AND METHODS A matched case-control study used a prospective cohort of patients with clinically suspected DVT admitted to emergency departments of seven hospitals in the Northwest Ohio and Southeast Michigan from 2014 to 2016. Cases were defined as patients with acute DVT confirmed by ultrasound (n.=221). Controls with negative for DVT ultrasound scans were selected by age and gender frequency match in 1:5 ratio (n.=1103). Relationships between the anatomical location of DVT, D-dimer levels, and Well’s score were examined using parametric and non-parametric (for Well’s score) statistics. ROC curves were analyzed to identify the best cut-off values for Well’s score and D-dimer.

RESULTS Among patients with positive DVT ultrasound scan, IF DVT was found in 75, FP in 92, Calf DVT in 54 8 patients. Both D-dimer and Well’s score showed high diagnostic value for identification of IF DVT with areas under ROC curves 0.9 and 0.8 correspondently (P<0.0001). Only D-dimer was sufficiently sensitive to identify FP DVT (ROC area 0.8, P<0.0001), neither D-dimer nor Well’s score had sufficient sensitivity to identify C DVT (ROC areas 0.6, P=0.1) Patients who had D-dimer of 700 ng/mL or more were 22.5 times more likely to have IF DVT(OR= 22.5, 95%CI 11.2 – 45.1), and those who had D-dimer level between 500 and 700 were 9.5 times more likely to have FP DVT (OR=9.5, 95%CI 5.7 – 16.0).

CONCLUSION These findings suggest that the D-dimer level of 700 ng/mL or higher is more likely to be associated with IF DVT. Urgent imaging studies in these patients may result in more timely management decisions.
5.6 ALGORITHM FOR PREVENTING SEVERE FORMS OF VENOUS INSUFFICIENCY FROM THE PERSPECTIVE OF THE CORRECTION OF ENDOTHELIAL DYSFUNCTION AND GENETIC STATUS

Igor Suchkov, Roman E Kalinin, Nina D Mzhavanadze
Department of Vascular Surgery, Ryazan State Medical University, Ryazan, Russia

AIM  The study was aimed at developing an algorithm for the prevention of severe forms of chronic venous insufficiency (CVI) based on endothelial function and genetic status.

MATERIALS AND METHODS  A total of 192 subjects including 40 healthy volunteers and 152 patients with post-thrombotic syndrome (PTS) after a deep vein thrombosis (DVT) of the lower limbs were enrolled. Disease was classified according to Clinical Etiological Anatomic Pathophysiological (CEAP) system. Patients with PTS were divided into 3 groups: group 1 (n.=60) received standard conservative treatment (SCT) including an anticoagulant, anti-inflammatory drugs, and elastic compression, group 2 (n.=60) received Detralex in addition to SCT, group 3 (n.=32) received vitamin B complex on top of SCT. All patients underwent measurements of nitric oxide (NO) metabolites and blood homocysteine level, computer photoplethysmography (PPG) with measurement of endothelial function index (EFI) and Duplex ultrasound of the lower limbs, at baseline, 1, 3, 6, and 12 months. Patients were also tested for mutations in coagulation factor V, fibrinogen, and methionine synthase reductase (MTRR) genes.

RESULTS  EFI at admission in patients with PTS was significantly lower compared to healthy volunteers and increased during treatment in all groups. They also had low levels of NO metabolites. Compared to other groups, the add-on therapy with Detralex (group 2) resulted in a more significant increase in EFI (P=0.039, intragroup comparison), and the greatest increment was observed by months 3 and 6 of continuous treatment (+29.7% and +42.7% respectively). Detralex treatment was associated with an increase in NO metabolites levels by 35.3%, 51.3% and 52.7% at 3, 6 and 12 months, respectively (P=0.019). Factor V Leiden mutation was present in 27 (45%) patients. The most frequent was the mutation in MTTR gene (heterozygous variant: 41.7% of cases, homozygous variant: 35.0% of cases), which can cause hyperhomocysteinemia and significantly impact the development of severe forms of CVI. The MTRR mutation was found to have the greatest effect on the course of PTS. This mutation in both heterozygous and homozygous variants was associated with a high proportion of patients classified C3-C4 (76.2% and 40.0% among homozygotes and heterozygotes, respectively).

CONCLUSION  PTS is associated with a low level of NO metabolites, and a negative or low EFI. Detralex can restore endothelial function and lead to a significant increase in the EFI and NO metabolites level. MTRR gene mutation is a significant risk factor for severe forms of CVI. Computer PPG, measurement of NO metabolites level, and detection of specific genetic mutations in hemostasis system should be performed in predicting and preventing severe forms of CVI after DVT.
6.1 SILENT PULMONARY EMBOLISM IN PATIENTS WITH SYMPTOMATIC DEEP VEIN THROMBOSIS – AN UNDERESTIMATED COMPLICATION

Georgios Galyfos, Gerasimos Papacharalampous, Anastasios Papapetrou, Georgios Sachsamanis, Christiana Anastasiadou, Ioannis Sachmpazides, Sotirios Giannakakis, Georgios Kastrisios, Chrisostomos Maltezos

Department of Vascular Surgery, ‘KAT’ General Hospital, Athens, Greece

AIM Silent or asymptomatic pulmonary embolism (PE) has been identified in almost one third of patients with symptomatic deep vein thrombosis (DVT), although its clinical impact has not been extensively evaluated in literature. Therefore, there are no specific recommendations concerning screening and management of such patients. Aim of this study was to evaluate its true incidence, risk factors and clinical impact.

MATERIALS AND METHODS Patients treated in our institution for symptomatic DVT without any symptoms or signs of PE were prospectively included in this study during a period of three years. DVT was diagnosed using coloured Duplex ultrasonography based on international guidelines. All patients underwent a thorax computed angiography in order to detect cases with silent PE. Basic characteristics of all patients and major outcomes were compared between patients with and without silent PE.

RESULTS Out of 122 patients in total, 32% of patients had silent PE. The most frequent risk factor was long-lasting bed rest/immobility (37%) followed by neoplasia (15%) and no obvious cause (32%). Patients with and without silent PE did not differ as far as location of thrombosis and typical risk factors was concerned. Additionally, death from all causes and days of hospital stay did not differ between the two groups. However, silent PE was an independent risk factor for new symptomatic PE (RR=5.675, CI 95% [1.592 – 20.233], P=0.0074) as well as readmission to hospital (RR=2.736, CI 95% [1.523 – 4.915], P=0.0008) during follow-up.

CONCLUSION Silent PE seems not to be associated with specific causative factors or location of DVT. However, silent PE is associated with late symptomatic PE and hospital readmission. Therefore, standardized screening for early detection and close follow-up may be necessary in such patients.
6.2 A RANDOMIZED TRIAL OF CLASS 2 AND CLASS 3 ELASTIC COMPRESSION IN THE PREVENTION OF RECURRENCE OF VENOUS ULCERATION

Dragan Milic¹, Sasa Zivic², Dragan Bogdanovic³, Milan Jovanovic⁴
¹Clinic for Cardiovascular and Transplant Surgery, Clinical Centre Nis, Nis, Serbia & Medical School University of Nis, Nis, Serbia
²Clinic for Cardiovascular and Transplant Surgery, Clinical Centre Nis, Nis, Serbia
³Institute for Public Health, Nis, Serbia
⁴Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia & Medical School University of Nis, Nis, Serbia

AIM Venous leg ulcers (VLU) are a major health problem because of their high prevalence and associated high cost of care. Despite the widespread use of compression treatment recurrence rates remain high and range according to different studies between 25-70%. Numerous studies have suggested that regular use of compression stockings reduces VLU recurrences. However, there are limited data concerning two important questions: for how long should compression hosiery be worn after ulcer healing and which class of compression hosiery achieves better results in the prevention of VLU recurrences. The aim of this study was to establish the efficacy of two different strengths of compression hosiery (Class 2 and Class 3) in the prevention of VLU recurrences.

MATERIALS AND METHODS An open, prospective, randomized, single-center study, with a 5-year follow-up was performed. Three hundred and eight patients (170 men, 138 women; mean age 59 years) with recently healed venous ulcers and no significant arterial disease, rheumatoid disease, or diabetes mellitus, were randomized into 2 groups: Group A) 158 patients who were wearing a heelless open-toed elastic Class III compression device knitted in tubular form – Tubulcus® (Laboratoires Innothera, Arcueil, France), and Group B) 150 patients who were wearing a Class 2 elastic stocking – (Rudo, Nis, Serbia). Patients were instructed to wear compression stockings during the first two years of the follow-up during day and night and in the third, fourth and fifth year of the follow-up patients were instructed to wear elastic stockings only during the day. One pair of elastic stockings was changed every four months. The main outcome measures were recurrence of leg ulceration and compliance with treatment.

RESULTS Twenty eight patients did not comply with their randomized compression class, 18 (11.39%) in Class 3 and 10 (6.66%) in Class 2 (P<0.05). Overall, 47.72% (147/308) of patients had recurrent leg ulceration by 5 years. Recurrence occurred in 51 (32.27%) of 158 Class 3 elastic compression cases and in 96 (64%) of 150 patients of Class 2 compression cases (P<0.05).

CONCLUSION The results obtained in this study suggest that Class 3 compression stockings provide statistically significant lower recurrence rate compared to Class 2 compression stockings. It may be prudent to advise patients to wear a lower class of compression stockings during the night and to wear elastic stockings of higher compression during the day.
AIM To describe venous Duplex scan baseline data in patients with chronic venous disease (CVD) and investigate the clinical effectiveness of a once daily 1000 mg oral suspension of micronized purified flavonoid fraction (MPFF) in improving CVD-related symptoms and quality of life.

MATERIALS AND METHODS In an international, randomized, double-blind, parallel-group study, symptomatic patients classified Clinical Etiological Anatomic Pathophysiologic (CEAP) C0s to C4s were treated for 8 weeks with either MPFF 1000mg once daily or MPFF 500 mg twice daily. The present post-hoc analysis focuses on patients randomised to the MPFF 1000 mg group, firstly to investigate the treatment effect throughout the treatment period and secondly to assess treatment effectiveness in the subgroup of patients with a venous reflux at venous Duplex scan. Lower limb discomfort, leg pain and leg heaviness were assessed using a 10-cm visual analog scale (VAS), and quality of life (QoL) was measured with CIVIQ-20.

RESULTS In 568 patients treated with MPFF 1000 mg oral suspension, a continuous improvement of lower limb discomfort was observed throughout the treatment period, with the following decreases in mean VAS scores: -1.31 cm from baseline to W2 (P<0.001), -0.91 cm from W2 to W4 (P<0.001), and -1.13 cm from W4 to W8 (P<0.001), which represented a total decrease of -3.27 cm from baseline to W8. Similarly, mean VAS scores decreases between the same time-points were: -1.26 cm (P<0.001), -0.89 cm (P<0.001) and -1.09 cm (P<0.001) for leg pain (total decrease of -3.17 cm) and -1.37 cm (P<0.001), -0.92 cm (P<0.001) and -1.10 cm (P<0.001) for leg heaviness (total decrease of -3.32 cm).

MPFF 1000 mg also continuously improved the QoL during the study: by 8.9 point from baseline to W2 (P<0.001), by 5.42 point from W2 to W4 (P<0.001), and by 4.61 from W4 to W8 (P<0.001) which represented a total improvement of 18.53 over 100 from baseline to W8.

Among patients treated with MPFF 1000 mg oral suspension, 357 patients (62.6%) had a venous reflux. In this population, lower limb discomfort was reduced by -3.24 cm, leg pain by -3.13 cm, leg heaviness by -3.24 cm on VAS scales and QoL (CIVIQ-20) was improved by 18.35 after 8 weeks of treatment.

CONCLUSION MPFF 1000 mg oral suspension treatment was associated with a rapid and continuous improvement in lower limb discomfort, leg pain, leg heaviness and QoL throughout the 8-week treatment duration in patients with CVD, including in those with a venous reflux.
6.4 **UTILITY OF AN ALGORITHM COMBINING VVSYMQ® AND VCSS SCORES TO PREDICT DISEASE SEVERITY IN C2 PATIENTS**

Lowell Kabnick¹, Thomas Wakefield², Mikel Sadek¹, Jose Almeida³, Glenn Jacobiwitz⁰

¹ New York University Langone Medical Center, New York, USA
² University of Michigan, Michigan, USA
³ Miami Vein Center, University of Miami, Florida, USA

**AIM** Validated diagnostic assessment tools such as the Venous Clinical Severity Score (VCSS) and the Clinical Etiologic Anatomic Pathophysiologic (CEAP) help determine how superficial venous disease impacts a patient. No single assessment tool provides accurate scoring for disease severity, and this is most clearly exemplified by the variability seen in C2 patient clinical presentations. This has resulted in inconsistent treatment algorithms, patient care, and payer reimbursement. The purpose of this study was to generate an algorithm that incorporates patient reported scores (VVSymQ®) and physician reported scores (VCSS) in order to improve stratification for disease severity in C2 patients.

**MATERIALS AND METHODS** Consecutive patients with symptomatic varicose veins were included. They were pooled from the VANISH-1 and VANISH-2 cohorts. VCSS and CEAP were calculated for each patient. Patients completed a 7-day electronic daily diary (VVSymQ®) to capture the type and severity of symptoms, including Heaviness, Achiness, Swelling, Throbbing, and Itching (HASTI). The relationship between the VCSS and VVSymQ® scores were evaluated using Pearson’s correlation. Frequency distribution analysis was used to classify patients according to VCSS and VVSymQ®.

**RESULTS** Two-hundred ten patients were identified with C2 disease. Patient demographics were as follows: Female 73%; Age 50 years (mean). Scoring systems revealed VCSS: mean=6.32 (range 3-16); VVSymQ®: mean 8.72 (range 1.29-22.86). A weak correlation was demonstrated between VCSS and VVSymQ® scores (r=0.22 and P=0.05). Figure 1 depicts the frequency distribution analysis: 61.4% of patients had low VVSymQ® and VCSS scores, indicative of mild symptomatology; 31.3% of patients had increased VCSS (range 7-9) and VVSymQ® scores (mean 10.7), indicative of daily symptoms of moderate severity; and an additional 7.3% of patients had VVSymQ® and VCSS scores that were inconsistent for patients with C2 disease.

**CONCLUSION** These data highlight the utility of combining patient reported scores and physician reported scores in order to stratify for disease severity in patients with C2 disease. For patients with combined elevated VCSS (7-9) and VVSymQ® (>9) scores, moderate to severe disease severity is corroborated, and interventional treatment may be indicated. For patients who do not meet the combined criterion of the algorithm, the disease severity is likely mild and conservative therapy such as lifestyle modification and compliance with compression may be the more appropriate treatment. Further prospective evaluation correlated to patient outcomes will help to determine the efficacy of this approach.
**AIM** Chronic vein insufficiency (CVI) affects up to 40% of the general population. It is mainly due to a congenital weakness of the vein wall. The gene is autosomal dominant, sex linked, with incomplete penetrance and variable expression. The progressive dilatation of the veins causes incontinence of the vein valves, venous hypertension and subsequent endothelial chronic inflammation. The disease affects the entire venous system and it is perpetuated by the chronic inflammation of the vein wall. TRAP (Three-dimensional Restorative Ambulatory Phlebotherapy) is a technique devised to treat the entire venous circulation of the lower limbs.

**MATERIALS AND METHODS** The TRAP treatment consisted in the injections into the dilated veins of the lower limbs of any diameter, of a non-obliterating 3% solution of sodium salicylate in a hydroglycerin buffered vehicle solution. All veins visible with both naked eye or by mean of trans-illumination were systematically injected. The treatment was carried out for 6 months, with one injecting session every two weeks. The average volume injected during every injecting session was 48 mL.

A retrospective cohort study has been carried out in 52 patients, 42 female and 11 male. Age range was 32–86. The diameter of the great saphenous vein was measured by ecography at time 0, at the end of the 6 months treatment, 6 months and 1 year post treatment.

**RESULTS** The average diameter of the saphenous vein was 5,58 (±0,88) at time 0; 2,96 (±0,20) at the end of the treatment; 2,95 (±0,2) 6 months post treatment and 2,86 (±0,24) 1 year post treatment. The reduction of the vein diameter was significant by the end of the treatment (P<0,00001) and the result was maintained at 6 months and one year. The appearance of reticular veins as well as symptoms and signs of CVI were progressively reduced until complete disappearance.

**CONCLUSION** The TRAP technique is currently producing promising and consistent results. This study suggests that a more systemic approach is paramount to the anatomical and functional treatment of CVI. The reduction of the veins internal diameter reduces the hydrostatic thrust. The restored continence of the perforating veins system treats the venous hypertension. This, in turn, determines the disappearance of all superficial visible veins. The endothelial chronic inflammation is also resolved with complete resolution of symptoms and signs of CVI. Larger clinical studies are needed to fully evaluate the impact of this conservative technique on the clinical course of CVI.
MINI-INVASIVE FOAM SCLEROTHERAPY ASSISTED LIGATION VERSUS SURGICAL FLUSH LIGATION FOR INCOMPETENT SAPHENO-POPLITEAL JUNCTION TREATMENT

Sergio Gianesini1, Erica Menegatti, Maria Grazia Sibilla2, Diana Neuhardt1, Mirko Tessari2, Paolo Zamboni4
1 University of Ferrara, Italy; USUHS University, Bethesda, USA
2 University of Ferrara, Italy
3 Comprehensive Interventional Care Center, Phoenix, USA
4 University Ferrara, Italy

AIM Management of sapheno-popliteal junction reflux can be cumbersome due to the use of a deep dissection for flush ligation and consequent possible iatrogenic nerve damage. Aim of the present investigation is to compare the performance of a surgical flush sapheno-popliteal junction ligation vs. a mini-invasive foam sclerotherapy assisted ligation.

MATERIALS AND METHODS Eighty-nine patients affected by sapheno-popliteal junction incompetence were enrolled in this retrospective analysis (37 M, 52 F; age: 56±6; C2-3EpAsPr). Forty-eight patients underwent a sapheno-popliteal junction flush ligation (group A). The remaining 41 underwent a ligation of the small saphenous vein (SSV) by means of a mini-invasive incision at the popliteal crease together with an intra-operative foam sclerotherapy of the popliteal stump and a simultaneous twist of the same sclerosed segment performed before the ligation of the stump (group B). The stump twist was aimed to confine the foam in the popliteal stump and to functionally close the drainage of the junctional tributaries. All incompetent SSV tributaries along the leg were flush ligated in both groups. All patients’ skin incisions were sutured by a subcuticular running suture using a 4-0 monofilament absorbable thread. Group A and B were compared for recurrence rate, procedural time, post-operative complications and disease-specific quality of life.

RESULTS Group A and B were homogeneous in hemodynamics and demographic characteristics. At 4.1±3.3 years mean follow up, sapheno-popliteal junction recurrence was detected in 4 patients of group A (4/48; 8.3%) and in 2 cases of group B (3/41; 7.3%) (P:ns). Mean procedural time was 36±11 minutes vs. 21±6 minutes (P<0.05). No significant differences were reported in post-operative complications with the exception of a mild postoperative paresthesia lasting more than 24 hours in 6.3% (3/48) of group A vs. 2.4% (1/41) (P<0.05) of group B. No need for analgesics was reported in both groups. At the one year check-up visit, Aberdeen Varicose Vein Questionnaire significantly improved in both groups from 17.8±4.7 to 4.7±3.1 in group A (P<0.0001) and from 17.7±4.9 to 4.2±2.8 in group B (P<0.0001).

CONCLUSION Foam assisted mini-invasive ligation of the sapheno-popliteal junction represents a time and clinical-effective option, associated with a decrease in postoperative paresthesia risk.
AIM Practice patterns associated with inferior vena cava (IVC) filter placement have seen considerable variation in the last decade as a result of both an increasingly unfavorable legal environment and the changes in coding and reimbursement established by the Centers for Medicare and Medicaid Services in 2012. We sought to use a statewide administrative database to identify trends in IVC filter placements and retrievals in the general population.

MATERIALS AND METHODS We reviewed Florida state inpatient and ambulatory surgery databases from 2004 to 2014. International Classification of Diseases, Ninth Revision diagnosis and procedure codes and Current Procedural Terminology codes were searched for patients undergoing inpatient or outpatient IVC filter placement, and each patient was longitudinally tracked to the time of inpatient or outpatient filter retrieval. The search strategy reflected introduction of new bundled Current Procedural Terminology codes in 2012. Retrievals after >1 year of filter dwell time were excluded. For inpatient filters, associated diagnoses were reviewed to identify indications for placement. Univariate and multivariate logistic regression models were constructed to identify factors associated with improved retrieval rates.

RESULTS There were 131,791 IVC filter placements identified during the 11-year period, with a maximum of 13,722 in 2010 and a 23.7% decline by 2014 (Figure 1). Median age at filter placement was 71 years (interquartile range, 57-81 years). Mean follow-up after filter placement was 17.3 ± 25.5 months. Only 8637 filters (6.6%) were retrieved. The annual retrieval rate ranged from 3.4% in 2004 to 8.5% in 2013; 6.5% of placements and 49.9% of retrievals occurred in the outpatient setting. Median filter dwell time was 96.5 days (interquartile range, 44-178 days). Diagnoses associated with filter placement included venous thromboembolism (75.9%), trauma (35.0%), hemor-

Figure 1. Inferior vena cava (IVC) filter placements and retrievals by year.
rhage (29.9%), malignant disease (29.4%), and stroke (5.1%). Retrieval rates were higher in patients with a trauma diagnosis (9.6% vs. 4.9%; P<0.001) and lower in patients with a malignant disease diagnosis (3.8% vs. 7.7%; P<0.001). The retrieval rate was also lower in Medicare patients (2.5% vs. 13.7%; P<0.001). In a multivariate logistic regression model, Medicare was associated with decreased retrieval rates (odds ratio [OR], 0.33; 95% confidence interval [CI], 0.31-0.35; P<0.001) after adjusting for age and associated diagnoses. A propensity score matched model was created using 86,222 patients (43,111 matched pairs) to better account for these confounding effects. In this model, Medicare persisted as a risk factor for decreased filter retrieval (OR, 0.43; 95% CI, 0.40-0.46; P<0.001). Weaker risk factors were increased age, male sex, white race, and diagnoses of deep venous thrombosis or malignant disease. A trauma diagnosis was protective (OR, 1.45; 95% CI, 1.37-1.53; P<0.001).

**CONCLUSION** IVC filter placements have decreased since 2010. Retrieval rates in the general population are steadily improving but continue to lag behind those described in center-specific literature. Changes in coding and reimbursement practices in 2012 did not significantly alter trends in filter placements or retrievals in Florida state. Retrieval rates are highest in younger trauma patients and lowest in elderly Medicare patients and those with a malignant disease diagnosis.
PR2 NUCLEAR MAGNETIC RESONANCE SPECTROSCOPIC ANALYSIS OF BIOFLUIDS FROM PATIENTS WITH CHRONIC VENOUS DISEASE

Sarah Onida, Richmond T. Bergner, Hannah Less, Joseph Shalhoub, Elaine Holmes, Alun H. Davies

Imperial College London, London, UK

AIM Chronic venous disease (CVD) is a common condition with an important clinical and socioeconomic burden and poorly characterized biology, particularly with respect to disease development and progression. The Clinical, Etiology, Anatomy, and Pathophysiology (CEAP) classification is employed to categorize disease stages according to severity, although the relationship between the different stages is not well defined. The aims of this study were to characterize the metabolic phenotype of CVD and, if a difference is identified, to explore any association with disease severity as classified by the CEAP grading system.

MATERIALS AND METHODS Participants with clinical symptoms of CVD scheduled for intervention and asymptomatic healthy volunteers were prospectively recruited from a single center (October 2014-June 2016). Serum and urine samples were collected and stored at 80 °C according to established standard operating procedures. Nuclear magnetic resonance spectroscopy techniques were employed to analyze the samples.

RESULTS The study recruited 517 individuals with CVD and 105 healthy volunteers. The nuclear magnetic resonance spectral data were preprocessed and multivariate statistical techniques applied to identify statistically significant trends. Metabolite identification was performed using in-house databases and the published literature. A regression analysis was performed for the most significant metabolites across the CEAP spectrum. 1-Methylhistidine, phenylalanine, tyrosine, glycerol, lysine, and succinate were found to be positively correlated with CEAP in serum. A negative correlation was identified between urinary metabolites and increasing CEAP class. Statistically significant trends were identified for formate, creatinine, glycine, citrate, succinate, pyruvate, and a-hydroxyisobutyrate.

CONCLUSION Metabolites identified correlating with CEAP stage belonged to the tricarboxylic acid cycle, hypoxia-inducible factor pathway, and one-carbon metabolism, suggesting increased energy metabolism in higher CEAP classes. This work has important translational potential with respect to diagnostic, prognostic, and therapeutic biomarker applications in CVD.
PR3 UNITED STATES ENDOVENOUS ABLATION PRACTICE TRENDS: 4-YEAR REVIEW OF MEDICARE PROVIDER UTILIZATION AND PAYMENT DATABASE

Joel M. Crawford1, Antonios Gasparis1, Jose Almeida2, Steve Elias3, Thomas Wakefield4, BK Lal5, Nicholas Osborne4, Sahar Amery1, Nicos Labropoulos1

1 Stony Brook Medicine, Stony Brook, New York, USA
2 Miami Vein Center, University of Miami, Miami, USA
3 Center for Vein Disease, Englewood, New Jersey, USA
4 Cardiovascular Centre, University of Michigan, Ann Arbor, Michigan, USA
5 University of Maryland Medical System, Baltimore, Maryland, USA

AIM The exponential growth of endovenous ablation in the United States during the last few years has raised concerns of overuse from vascular societies and payers. The reasons for such growth are unclear (i.e., increased awareness, less invasive procedure, or inappropriate overuse). In addition, physicians performing these procedures outside of their scope of practice raise concerns regarding adequacy of training. The Medicare Provider Utilization and Payment Database can be used to evaluate practice trends in Medicare beneficiaries.

MATERIALS AND METHODS The Medicare Provider Utilization and Payment Database was queried for endothermal ablation Current Procedural Terminology codes 36475, 36476, 36478, and 36479 from 2012 through 2015. These results were imported into a relational database program. Queries were designed to ascertain the practice trends of all providers, inclusive of all specialties, and the data were exported to a spreadsheet program for analysis. Analysis for ablations per patient was calculated by assessing the number of beneficiaries that underwent at least one ablation by a provider in relation to the total number of ablations performed by that provider.

RESULTS Most saphenous vein ablations were done by vascular surgery (29%), cardiology (21%), and general surgery (14%) practitioners. The remaining one-third was performed by 41 other provider specialties. Regional variation was significant, with 47% of ablations being performed in the south (Florida, 10.4%; Texas, 9%). The southern region also had the highest growth with >127,000 cases added in 2015 (150% growth). Ablations per patient averaged 1.8 in the aggregate data set. Independent annual assessment of ablations per patient remained relatively constant: 2012, mean 1.8; 2013, mean 1.8; 2014, mean 1.8; and 2015, mean 1.9. Vascular surgery, cardiology, and general surgery specialties trended closer to the average, whereas the less represented specialties trended above the average. When the threshold was set to two ablations/patient for the year 2015, there were 295 providers above the threshold representing 20% of providers. Growth was noted during the 4 years with an increase in providers of 354 (16%), ablations of 37,682 (28%), and patients of 17,002 (23%). The provider and procedural growth rates during the time period of the database were 10% and 26%, respectively, for vascular surgery, 35% and 51% for cardiology, and 9% and 0.4% for general surgery.

CONCLUSION Endovenous ablation is performed by a wide variety of subspecialists with different levels of formal training for the management of chronic venous disease. There was an annual increase in the number of providers and ablations performed during this 4-year period of evaluation. Most ablations (64%) were performed by formally trained vascular surgeons, cardiologists, and general surgeons. The number of ablations per patient was higher than average in specialties without any vascular training. This data analysis can help establish better guidelines and governance for the use of endovenous ablation. As our health care system shifts from a fee-for-service to a value-based system and taxpayer-funded resources in Medicare patients become less available, it is important that practice trends be scrutinized using data-driven initiatives.
PR4 NUTCRACKER SYNDROME CAN BE OVER-DIAGNOSED BY DUPLEX ULTRASOUND – LEFT OVARIAN VEIN REFLUX CAN BE THE CAUSE OF RENAL VEIN NARROWING RATHER THAN AN EFFECT OF OBSTRUCTIVE FLOW


The Whiteley Clinic, Guildford, UK

AIM In June 2016 we introduced trans-abdominal Duplex ultrasound (TADUS) alongside our existing routine trans-vaginal Duplex ultrasound (TVDUS) performed for pelvic venous reflux. We performed these scans for diagnosis at initial presentation and repeated this at 6-8 weeks following Pelvic Vein Embolization (PVE). Our aim was to: 1) Identify the proximal extent of Left Ovarian Vein (LOV) reflux; 2) Evaluate the left renal vein (LRV) and identify or exclude Nutcracker phenomenon as a cause of LOV reflux; 3) Compare any change in appearance or caliber of the LRV following PVE.

MATERIALS AND METHODS 24 female patients (age 26-68, mean 44) underwent PVE between September 2016 and April 2017. TADUS was performed with patients erect and 30 degrees recumbent to examine the LRV. Diameters of the hilar and mesoaortic LRV and ratios were recorded at diagnosis and after PVE. A hilar to mesoaortic diameter ratio of greater than 5 raised suspicion of Nutcracker Phenomenon. Group 1, 11 patients. All exhibited proximal and distal LOV reflux prior to PVE. 2 presented with debilitating pelvic congestion syndrome (PCS) but no leg varicose veins (VV), 7 with leg VV and moderate pelvic symptoms, 2 with leg VV with pelvic communication but no pelvic symptoms. Group 2, 10 patients. 8 with no LOV reflux, 2 exhibiting reflux only in the distal segment of the LOV. All presented with leg VV communicating with the pelvis. Only 2 patients exhibited pelvic symptoms. 3 patients excluded. 1 with May Thurner. 1 with aberrant anatomy. 1 failed embolization of the LOV due to tortuosity.

RESULTS Group 1: 11 patients with LOV reflux had pre PVE hilar to mesoaortic diameter ratios with a mean of 5.0 and post PVE diameter ratios with a mean 2.0 (P=0.001). Group 2: 10 patients, 8 without LOV reflux and 2 with LOV reflux distally had pre PVE ratios with a mean of 2.1 and post PVE with a mean ratio of 2.0 (P=0.799) 5 patients in Group 1 had hilar to mesoaortic diameter ratios >5 prior to PVE with suspicion of Nutcracker (Table I). These 5 included both patients with PCS who experienced complete symptomatic resolution post PVE. Post PVE all patients in Group 1 had diameter ratios <5 with no evidence of Nutcracker phenomenon.

CONCLUSION Nutcracker phenomenon has previously been suggested as a cause of LOV reflux, secondary to obstructive flow and increased venous pressure due to compression of the left renal vein between the Aorta and superior mesenteric artery. However, in this study, LOV reflux appeared to cause a siphon effect, with LRV drainage preferentially following the LOV reflux path. This results in physiological narrowing of the mesoaortic LRV. This effect is relieved following successful embolization of the LOV.
Table I. No patients in Group 2 had pre or post PVE hilar to mesoaortic ratios in the Nutcracker range.

<table>
<thead>
<tr>
<th>Group 1 pre PVE hilar to mesoaortic diameter ratio</th>
<th>Group 1 post PVE hilar to mesoaortic diameter ratio</th>
<th>Group 2 pre PVE hilar to mesoaortic diameter ratio</th>
<th>Group 2 post PVE hilar to mesoaortic diameter ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6</td>
<td>3.5</td>
<td>1.6</td>
<td>1.0</td>
</tr>
<tr>
<td>6.7</td>
<td>0.5</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>4.4</td>
<td>1.7</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>4.2</td>
<td>2.3</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>3.5</td>
<td>2.4</td>
<td>3.0</td>
<td>2.7</td>
</tr>
<tr>
<td>2.5</td>
<td>1.0</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>8.5</td>
<td>1.7</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>2.3</td>
<td>2.1</td>
<td>2.6</td>
<td>0.8</td>
</tr>
<tr>
<td>6.2</td>
<td>2.9</td>
<td>3.3</td>
<td>3.7</td>
</tr>
<tr>
<td>3.0</td>
<td>1.8</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>7.0</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 1 average pre PVE ratio</th>
<th>Group 1 average post PVE ratio</th>
<th>Group 2 average pre PVE ratio</th>
<th>Group 2 average post PVE ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>2.0</td>
<td>2.1</td>
<td>2.0</td>
</tr>
</tbody>
</table>

REFERENCES


**PR5** DIAGNOSTIC EFFICACY OF DUPLEX- AND NEAR-INFRARED SPECTROSCOPY-DERIVED PARAMETERS IN PREDICTING POST-THROMBOTIC SYNDROME IN PATIENTS WITH A FIRST EPISODE OF DVT

Yamaki T, Sasaki Y, Osada A, Sakurai H

*Department of Plastic and Reconstructive Surgery, Tokyo Women’s Medical University, Tokyo, Japan*

**AIM** Early detection of deep vein thrombosis (DVT) is important for decreasing the risk of post-thrombotic syndrome (PTS). However, it is difficult to reliably predict which patients are likely to develop PTS in acute phase of DVT. Therefore, we investigate the indicative parameters reflecting the progression of PTS using Duplex ultrasound scanning (DUS) and near-infrared spectroscopy (NIRS) in patients with a first episode of DVT.

**MATERIALS AND METHODS**

**Study 1:** one-hundred and twenty-one patients were enrolled. Venous abnormalities, including obstruction and reflux, were evaluated at 6 months using DUS. The main Duplex-derived parameters assessed were diameter (cm), reflux times (s), peak reflux velocity (cm/s), mean reflux velocity (cm/s) and total reflux volume (mL).

**Study 2:** one-hundred and twenty-nine patients were enrolled. NIRS was used to measure changes in the levels of oxygenated hemoglobin (O$_2$Hb) and deoxygenated hemoglobin (HHb) in calf muscle at 6 months after DVT. On standing, increases in O$_2$Hb and HHb were calculated ($\Delta$O$_2$Hb$_{st}$ and $\Delta$HHb$_{st}$). The times taken for the O$_2$Hb and HHb concentrations to become maximal ($T_{O2Hbst}$ and $T_{HHbst}$) were also measured. During 10 tiptoe movements, continuous decrease in O$_2$Hb was observed ($\Delta$O$_2$Hb$_{ex}$). On the other hand, 10 tiptoe movements produced venous expulsion ($\Delta$HbE$_{ex}$) and a subsequent retention ($\Delta$HHbR$_{ex}$). The oxygenation index (HbD; HbD = O$_2$Hb - HHb) was also calculated at the end of standing and at the end of 10 tiptoe movements ($\Delta$HbD$_{st}$ and $\Delta$HbD$_{ex}$). PTS was considered to be present if the Villalta score was >5.

**RESULTS**

**Study 1:** of the 121 patients evaluated, 25 (21%) developed PTS. At 6 months, venous occlusion combined with reflux (OR 4.4, 95% CI 2.9-20.7), peak reflux velocity >29.7 cm/s (OR 13.7, 95% CI 4.1-45.7) and mean reflux velocity >8.6 cm/s (OR 4.4, 95% CI 1.5-12.9) in the popliteal vein detected by Duplex scanning were strong predictors of PTS.

**Study 2:** thirteen patients were excluded from the study. Thus, 116 patients were finally included. Of these, 19 (16%) developed PTS. Among NIRS-derived parameters, $\Delta$O$_2$Hb$_{st}$ had the highest under area curve (0.88, 95% confidence interval (CI) 0.80-0.93, P<0.0001) with the best cut-off value ($\Delta$O$_2$Hb$_{st} \leq 48$). Multivariate logistic regression analysis finally revealed venous occlusion combined with reflux (OR 4.38 CI 0.52-20.86, P=0.039) and NIRS-derived $\Delta$O$_2$Hb$_{st} \leq 48$ s (OR 5.31 CI 0.36-302.44, P < 0.001) as independently associated with progression of PTS.

**CONCLUSION** Venous occlusion and reflux, peak reflux velocity >29.7 cm/s and mean reflux velocity >8.6 cm/s on DUS, and NIRS-derived $\Delta$O$_2$Hb$_{st} \leq 48$s at 6 months are promising time-course predictors of PTS progression.
AIM  DOAC have several advantages over warfarin, including rapid onset of action, lower risk of intracranial hemorrhage. However, the effective and safe protocol of PTE therapy with DOAC has not been established.

MATERIALS AND METHODS  We prepared the DOAC protocol for intermediate-risk PTE patients who were treated with DOAC in the intensive period, two hours after unfractionated heparin bolus. We compared the efficacy and safety (bleeding) between the DOAC protocol and conventional therapy with warfarin. The efficacy was evaluated by the changes in right ventricle / left ventricle (RV/LV) ratio on computed tomography and BNP between admission and discharge. Between December 2012 and December 2016, 31 were enrolled in this study. 11 patients had the DOAC protocol and 20 had conventional therapy. There were no significant differences between the two groups in BNP and RV/LV ratio at baseline.

RESULTS  In the patients who received the DOAC protocol, RV/LV ratio (from 1.38±0.41 to 0.84±0.16, P<0.01) and BNP (from 250±203 to 33±33 pg/dL, P<0.05) was significantly decreased. In patients who received conventional therapy, RV/LV ratio (1.32±0.28 to 0.95±0.19, P<0.01) and BNP (157±157 to 50±85 pg/dL, P<0.01) was significantly decreased. No one had bleeding at the DOAC protocol. Two patients had bleeding at conventional therapy. There are no significant differences in the efficacy and safety between two groups.

CONCLUSION  These findings indicate that efficacy and safety were comparable between DOAC and conventional therapy for patients with intermediate-risk PTE patients.
eP1  LONG-TERM VEIN DIAMETER REDUCTION BY PERIVENOUS HYALURONAN INSTEAD OF TUMESCENCE FOR ENDOVENOUS PROCEDURES

Johann Chris Ragg, Krastinya Stoyanova
Angioclinic Vein Centers, Berlin, Germany

AIM  Thermal closure methods are currently replacing surgery in the treatment of saphenous vein insufficiency. However, standard saline-based tumescent anesthesia is not suitable for optimal results, as the target vein is just compressed for a few hours. After basic experience with hyaluronan gels (2013, 2015) we now evaluated a new NASHA hyaluronan of lower viscosity for easier injection to provide initial and long-term vein lumen reductions.

MATERIALS AND METHODS  40 patients (24 f, 16 m, 46-73 years) with insufficiency of the GSV, diameter 7.2-21.6 mm, distance to skin >10 mm, receiving endovenous laser treatment (1470 nm) or catheter microfoam (Biomatrix sclerofoam, Aethoxysklerol 2%) were randomized for two modalities of lumen reduction: Group A received a novel prototype monophasic hyaluronan gel of low viscosity (n.=10; \( \eta = 10^3-10^4 \) mPa s, coaxial injection) while another group (B) received standard tumescent fluid (n.=10). Some patients (n.=20) received both hyaluronan and tumescence in adjacent GSV segments. Clinical and sonographic follow-up was performed after 2 and 8 weeks.

RESULTS  Hyaluronan placement was technically successful (>50% lumen reduction) in all cases (40/40), using 1-3 mL/cm, mean 2.2 mL/cm. Initial diameter reduction obtained by hyaluronan was 52-75%, mean: 63.3% (Figure 1). Clinical follow-up showed a complete absence of symptomatic inflammatory reactions and no discolorations in hyaluronan-treated segments (n.=30) during 8 weeks, while segments with tumescent anesthesia had symptomatic inflammations in 16/30 segments (76.7%, prescription of oral analgetics), some requiring mini-thrombaspirations (9/30, 30.0%). Visible hematoma were present in 1/30 (3.3%) in hyaluronan-covered segments versus 21/30 (73.3%) after tumescence. Particular benefit was noted for veins >10 mm at the distal thigh and knee region. No adverse events of hyaluronan were observed.

Figure 1.

CONCLUSION  Initial and long-term vein lumen reduction during endovenous methods, sufficient for asymptomatic postprocedural periods, can be obtained by use of cross-linked hyaluronan of low viscosity instead of saline.
AIM  Common sclerofoams (Cabrera type, including VariThena/BTG) are inferior to thermo-occlusion regarding primary and long-term results. A novel viscous microfoam using a biomatric based on denatured autologous blood proteins now was evaluated in various targets.

MATERIALS AND METHODS  In a prospective study, 85 patients (56 f, 29 m, 31-78 J.) were selected in bail-out situations to receive biomatrix sclerofoam (BSF) instead of standards. Targets (n.=230) were: 1. GSV including SFJ, 6-14 mm Ø, mean: 8.7 mm, n.=65; 2. SSV including SPJ, 6-11 mm Ø, mean: 7.2, n.=20; 3. Perforators, 4-11 mm Ø, mean: 6.9 mm, n.=43), 4. tributaries, 5-13 mm Ø, n.=64; 5. Recurrent varicosities 5-15 mm Ø, n.=38. The foam, prepared from 40% Aethoxysklerol 2%, 20% biomatrix and 40% gas, was deployed via catheter (PhleboCath, 2.0-2.3 mm Ø, or Microcath 1.6 mm Ø). Follow-up including ultrasound was performed after 2 weeks, 2 months and one year.

RESULTS  Primary total occlusion of all segments intended to treat was obtained in 213/220 cases (96.9%). 7 targets (3.2%) required a second foam application (GSV: n.=1, tributaries: n.=2, perforators n.=2, recurrences n.=2). There were no complications, in particular no DVT. After one year, partial reperfusion was observed: SFJ 3/65 cases (4.3%), GSV: 4/65 (6.2%), SSV: 1/20 (5.0%), tributaries: 6/64 (9.4%), perforantors: 4/43 (9.3%), in recurrent varicosities: 4/38 (10.5%).

CONCLUSION  The novel foam is safe and effective for all major leg vein targets to occlude. Direct comparison to standards will follow.
aim
The aim of the current survey was to examine the rationale for prescribing Micronized Purified Flavonoid Fraction (MPFF) to improve venous symptoms resolution in patients classified Clinical Etiological Anatomic Pathophysiologic (CEAP) class C1 with dilated intradermal veins scheduled for sclerotherapy.

materials and methods
In a national, multicenter, observational program, physicians from across the Russian Federation recruited CEAP C1s patients scheduled for phlebosclerosing treatment. The decision to prescribe adjuvant MPFF (1000 mg/day for 6 weeks beginning 2 weeks before sclerotherapy) was made according to usual practice. Disease severity and treatment outcomes were assessed at baseline and 4 weeks post-sclerotherapy using a visual analog scale (VAS) as well as quality-of-life (CIVIQ-14) and patient satisfaction (Darvall) questionnaires.

results
A total of 70 physicians recruited 1150 patients: 1071 (93%) women and 79 (7%) men. Mean age was 40.7±10.7 years (range 18-74) and mean (±SD) body mass index was 23.6±3.3 kg/m². Reticular veins were observed in 42.1% of patients and 57.9% had telangiectasias. MPPF was prescribed to 905 patients (79%). Sclerotherapy was associated with statistically significant decreases in mean VAS scores for all venous complaints including leg heaviness, pain, sensation of swelling, night cramps and itching. For each of these symptoms, patients treated with MPFF showed a more pronounced improvement than those undergoing sclerotherapy alone: for pain, mean VAS value decreased from 1.90±2.30 to 0.30±0.62 in patients who received MPFF and from 1.72±1.93 to 0.52±0.99 in patients treated with sclerotherapy alone. Similarly, leg heaviness decreased from 2.80±2.43 to 0.47±1.07 in patients who received MPFF and from 2.38±2.23 to 0.76±0.85 in patients treated with sclerotherapy alone. Patient quality-of-life indicators improved with resolution of symptoms, particularly pain, and for each indicator the observed improvement was greater with MPFF. The outcomes of treatment exceeded patient expectations. Furthermore, the proportion of patients who experienced sclerotherapy-induced hyperpigmentation was significantly lower in patients treated with the adjunction of MPFF compared with those treated with sclerotherapy alone (33.9% of the patients vs. 41.2%, respectively, P=0.034). No adverse events related to MPFF were observed.

conclusion
Resolution of venous symptoms post-sclerotherapy was greater in patients treated with MPFF compared with those undergoing sclerotherapy alone. MPFF was also associated with a reduced incidence of sclerotherapy-induced hyperpigmentation and improved quality-of-life indicators, particularly pain. The results support the rationale for the use of MPFF in patients undergoing sclerotherapy.
AIM Accessory saphenous vein (ASV) insufficiency is one of the most common causes of late varicose vein recurrence after endovenous laser ablation (EVLA) for great saphenous vein (GSV) insufficiency. Therefore, the increased ASV occlusion rate can be associated with better long-term results. Because the radial fiber emits the energy radially at the fiber tip, it can be positioned closer to the saphenofemoral junction (SFJ). In this study, we investigated the occlusion rate of the ASV after EVLA using a radial fiber.

MATERIALS AND METHODS 127 limbs in 114 patients undergoing EVLA of the GSV with a radial fiber (1470 nm diode laser) were evaluated. Concomitant direct ablation of the ASV was excluded from the study. The fiber tip was positioned at not less than 5 mm from the SFJ regardless of the superficial epigastric vein (SEV). Laser power was set between 8 and 11W according to the GSV diameter. Higher laser energy density was applied to the proximal GSV including the ASV orifice. The SFJ tributaries were precisely examined within 5 cm from the SFJ using duplex ultrasound scanning preoperatively, 1 and 3 months after EVLA.

RESULTS The anterior (106 limbs, 83%) and/or posterior (34 limbs, 27%) ASV were identified in 123 limbs (97%) before EVLA. The distance from the SFJ to the anterior ASV, the posterior ASV and the SEV orifice were 10.8±8.5 mm, 16.8±12.1 mm and 7.6±3.6 mm respectively. The distance from the SFJ to the fiber tip was 8.4±2.1 mm at the time of EVLA. Endovenous heat-induced thrombosis (EHIT) class 2 (Kabnick classification) was developed in 9 limbs (7%) one day after EVLA but resolved mostly in one week with rivaroxaban. No major adverse events were observed. The ASV occlusion rate was 72% at one month after EVLA but reduced to 53% at 3 months because of ASV recanalization. The SEV occlusion rate was 37% and 18% and the GSV occlusion rate was 100% and 100% at 1 and 3 months respectively. The preoperative distance from the SFJ to the ASV orifice (13±9 mm versus 7±4 mm, P<0.001) were longer, laser energy density (88±20 J/cm versus 80±12 J/cm, P=0.023) was greater, and the SEV occlusion rate (30% versus 6%, P=0.002) was higher in the occluded ASV group (n.=57) than in the patent ASV group (n.=51) at 3 months.

CONCLUSION These data suggest that ASV occlusion can be achieved safely during EVLA of the GSV using a radial fiber positioned closer to the SFJ. However, some anatomical and technical factors may be associated with successful ASV occlusion.
AIM Randomized, comparative and prospective study between radiofrequency venous ablation and sclerotherapy with polidocanol foam 3% versus only radiofrequency venous ablation in saphenous veins of 1.5 cm of diameter or more.

Radiofrequency ablation of saphenous veins has been used for decades with excellent results in saphenous closure for reflux but has some cases of recanalization in saphenous veins of diameters of 1 cm or more in 10-15% of cases after one year follow-up, so we used foam sclerotherapy to optimize venous ablation and decrease recurrence of recanalization.

MATERIALS AND METHODS For one year we followed 50 patient’s legs with venous ablation of saphenous vein with radiofrequency and 50 patient’s legs with venous ablation and sclerotherapy with 3% polidocanol foam in veins larger than 1.5 cm until 2.5 cm of diameter and we compared the number of saphenous veins that recanalized with both techniques for one year follow-up with Doppler duplex ultrasound.

RESULTS We operated in 100 legs that had saphenous vein reflux and measured 1.5 cm of diameter or more the largest vein measured 2.5 cm larger diameter veins were operated by open surgery (stripping). 50 saphenous veins were ablationated with radiofrequency (VNUS CLOSURE FAST) 4 activations on the catheter and removed 3.5 cm each time, and the other 50 legs we used the same technique and after the ablation we injected 5 mL of 3% polidocanol foam with Tessari technique into the saphenous vein.

After 12 months of follow-up of the 50 first legs, 36 (72%) saphenous veins ablationated continued closed, 7 (14%) partially closed and 7 (14%) totally recanalized therefore some of them didn’t continued with reflux.

The other 50 legs follow-up treated with saphenous vein ablation and with 3% polidocanol, 47 (94%) continued totally closed and 3 (6%) were partially recanalized (P<0.05).

CONCLUSION The use of radiofrequency ablation for saphenous veins diameter larger than 1.5 cm until 2.5 cm it’s possible with good results of venous closure with the combination of ablation and foam sclerotherapy with 5 mL of 3% polidocanol than without it obtaining excellent results (P <0.05) in one year follow-up with Doppler duplex ultrasound, you can still use endovenous ablation techniques in patients with really large saphenous veins obtaining same results as not so large veins, obtaining the benefit of minimally invasive operations for chronic venous disease.
AIM Sclerotherapy is well established and widespread treatment method of superficial venous insufficiency. Despite very good effectivity there are several adverse events such as hyperpigmentation, induration connected with longer recovery. Treatment varicose veins by using saline flush sclerotherapy with tumescence compared to common sclerotherapy.

MATERIALS AND METHODS 28 patients were randomized into two arms for ultrasound-guided and LEDX navigated foam sclerotherapy of tributary varicosities, according CEAP classification from C2-C4. We used 0.5%, 1% and 2% of polidocanol. First arm 14 patients: sclerotherapy with tumescence and with saline flush before sclerotherapy. Second arm 14 patients: sclerotherapy without tumescent and saline flush. Patients were followed up in 1 and 6 months. There were applied compression stockings in both arms for 7 days at least. Technical success measured by ultrasound, postprocedure quality of life (EQ-5D), manifestations of hyperpigmentation were observed.

RESULTS We observed the technical success after 6 months 13 (92.8%) vs. 10 (71.4%) patients. Quality of life (EQ-5D) median 6 vs. 8. Manifestation of pigmentation 1 case of mild (7.1%) vs. 4 cases (28%) – 3 cases (21.4%) of moderate and 1 case (7.1%) of mild pigmentation.

CONCLUSION Using tumescence sclerotherapy with saline flush seems to be the technique with better quality of life, earlier recovery, with higher technical success and less manifestation of hyperpigmentation.
AIM  Symptomatic postthrombotic disease (PTD) affects at least 30-50% of patients with deep vein thrombosis. Postinflammatory vein wall remodeling and destruction of the venous valves is considered to be the main morphological substrate for PTD. Despite conflicting evidence from the SOX trial, compression therapy remains the mainstay of treatment for postthrombotic syndrome. However, compression therapy does not eliminate chronic structural postthrombotic changes, implies lifelong treatment, ineffective in many cases, and low overall patient compliance remains a serious challenge. Percutaneous balloon angioplasty and stenting of iliofemoral venous segment have recently improved the outcomes for patients with severe PTS related to venous outflow obstruction. Minimally invasive surgery on superficial venous system may also be effective in selected patients. Despite this, PTS remains resistant to current therapy in many cases. Pooled data analysis of surgical correction of the deep axial reflux by transposition and autotransplantation of a valve-containing venous segment demonstrates good 5-year results in half of patients. However, there is currently low correlation between hemodynamic effect and clinical success of deep vein surgery in published literature.

The main goal of this study is to develop a novel surgical technique on venous neovalve formation to correct deep axial reflux and improve venous outflow in postthrombotic disease.

MATERIALS AND METHODS  We performed the first series of in vitro experiments using methods of mathematical modeling. Five macroscopically intact (n.=5) common femoral veins were taken on autopsies from individuals without history of venous thrombosis. Five (n.=5) common femoral veins were taken on autopsies from individuals with PTD. Neovalve was created in vitro.

RESULTS  An original model of autologous venous neovalve was developed. During mathematical modeling appropriate dimensions of the neovalve were determined to resemble morphology of a native valve. An optimal vein wall thickness for neoleaflets was determined to enable appropriate elasticity and coaptation. The surgical technique involves complete transection of the common femoral vein, eversion of the proximal end of the vessel with simultaneous endophlebectomy of both fibrotic septae and thickened excessive neointima, and creation of neoleaflets from the inverted vein wall by interrupted sutures. The hydraulic probe demonstrated good competency of the neovalve at 1.5 atm in vitro. The absence of outflow obstruction was predicted as less than 20% stenosis during the maximal valve leaflets separation. The necessity of extravasal correction with a frame spiral was also evaluated.

CONCLUSION  A novel experimental model of autologous deep venous neovalve was created and evaluated in vivo. «In vivo» experiments to evaluate hemodynamic effect, thrombosis risk, and long-term hemodynamic effect.
**AIM** Superior vena cava syndrome is a devastating complication of obstructive lesions compromising the superior vena cava and its branches. Most cases today are caused by malignant tumors. The most frequent are lung carcinoma.

**MATERIALS AND METHODS** Between 1995 and 2014, 65 patients with superior vena cava syndrome underwent surgical treatment for thoracic tumors. In all cases, the vena was restricted by a neoplastic sleeve. A vertical sternotomy was performed in mostly cases. Another patients received an associated right anterolateral thoracotomy to obtain good surgical exposure for tumor resection and grafting.

**RESULTS** A 12-18 mm diameter polytetrafluoroethylene graft was inserted in all cases. The tumor resection was radical in 39 (60%) cases and palliative in 26 (40%). All patients had immediate relief of obstruction after by-pass. Five patients alive without disease at now. Median morbidity 21 months. All prostheses were passable imposed under control ultrasound, CT studies performed in all patients after 6,12 months. Cases of pulmonary embolism was not.

**CONCLUSION** Resection and prosthetic superior vena cava with malignancies of the chest cavity accompanied by long-term survival of patients with preserved patency imposed prostheses and the absence of PE.
eP9  HYPERPIGMENTATION AS AN AESTHETIC FEATURE OF EARLY POSTOPERATIVE PERIOD FOLLOWING MECHANOCHEMICAL OBLITERATION OF VEINS USING THE FLEBOGRIF SYSTEM

Sergey Markin, Ivan Klimchuk, Sergey Kalinin, Nicolai Rogovoi, Artem Mordovin

1 Surgery Department, Russian Academy of Sciences Hospital, St. Petersburg, Russia
2 Surgery Department, City Hospital No. 40, Minsk, Belarus

AIM  Active introduction of mechano-chemical obliteration into clinical practice determined the appearance of new features during the postoperative period, which are different from endovascular methods of the "gold standard". Among these manifestations, a special place is taken by the pigmentation in the projection of the obliterated vein as a response on endothelium to the combined effect of the cutting edges of the Flebogif catheter and the form-form of 3% ethoxysclerol. The aim of the study was to clarify the incidence of hyperpigmentation and the dynamics of the process during the postoperative period.

MATERIALS AND METHODS  The research was carried out in Minsk City Hospital No. 40 and Russian Academy of Sciences Hospital, St. Petersburg and covered the period from November 2016 to January 2018. Mechano-chemical obliteration was performed on 164 patients: 69% women and 31% men. Obliteration of GSV was performed in 79% of the cases, SSV – in 21% of the cases. 3% ethoxysclerol (1 cm³ for 4-5 cm) was used to perform mechano-chemical obliteration. The positioning of the end of the catheter was 1-2 cm from the ostial valve. In the postoperative period, patients were recommended to wear Class 2 compression stockings for 30 days and adhere to high physical activity. Routine appointment of anticoagulants was not carried out. Clinical examination was carried out 1-2 days, 1 week and 1 month after the operation. Patients with detected pigmentation were examined after 3 and 6 months. The presence of pigmentation was measured by visual inspection, no special methods were used.

RESULTS  During the follow-up visits, 29 patients, which made 17.6% of the patients, showed signs of pigmentation after 7 days following the operation. At the same time, 20 patients (69%) showed pigmentation with phlebitis clinic of varying severity level. Further observation showed pigmentation resolution in 11 patients after 3 month following the operation. Examination of the remaining 9 patients 6 months after the operation did not reveal any significant traces of the pigment. Specific measures to correct pigmentation were not performed, topical therapy was not prescribed.

CONCLUSION  Thus, pathogenetic aspects of mechano-chemical obliteration determine the appearance in the early postoperative period of hyperpigmentation with a frequency exceeding similar parameters for endovenous laser and radiofrequency obliteration. These manifestations are transient and most are often accompanied by a reactive phlebitis, which are resolved within a period of up to 3 months in most cases. These manifestations are resolved independently and do not require additional medicamentous, non-medicamentous therapy. In order to improve compliance, it is expedient to preoperatively inform patients about such temporary manifestations.
 AIM At the present time endovenous methods of treatment of varicose veins have become more and more popular. However, after their using it had been appeared a new complication such as endovenous heat-induced thrombosis (EHIT). First of all the EHIT was described by Lawell S. Kabnick in 2005. Also Kabnick used classification of EHIT which consists of 4 classes. Nowadays, the majority of doctors use the parenteral treatment of EHIT by low-molecular weight heparin. However, after appearance of new oral anticoagulants such as rivaroxaban the treatment of EHIT by them become substantiated. But in modern scientific articles this direction hasn't been investigated enough. The aim of our work was to investigate the efficacy of rivaroxaban for the treatment of EHIT after endovenous laser ablations (EVLA).

MATERIALS AND METHODS Prospective noncomparative study includes 1326 patients who had 1514 EVLA over the period from December 2015 to September 2017. In 1091 (72.1%) cases the great saphenous vein (GSV) was ablated. The anterior accessory vein (AASV) was treated in 124 (8.2%) cases and small saphenous vein (SSV) was treated in 299 (19.7%) cases. We used 1470 nm laser, radial fibers and automatic pull-back device. The diameter of the veins close to sapheno-femoral junction was from 5 mm to 38 mm (mean 14±4.3 mm). We used the power of 5-10W. The LEED was from 50 J/cm to 90 J/cm. The EHIT were found out in 21 (1.4%) cases. 19 (1.7%) patients had EHIT of GSV and in 2 (1.6%) cases there was EHIT of AASV. We didn’t observed any EHIT after treatment of SSV. All the patients with EHIT were prescribed rivaroxaban.

RESULTS According to Kabnick classification it was the 1st class EHIT in 9 (0.6%) cases, the 2nd class in 10 (0.7%) cases and there were only 2 (0.1%) cases of 3rd class EHIT. All the patients with the 1st class were prescribed rivaroxaban 20 mg once a day and we used 15 mg twice a day for the patients of the 2nd and the 3rd classes of EHIT. We had to stop of using rivaroxaban for 1 (4.8%) patient because of dyspepsia. In this case we began to use enoxaparin in therapeutic dosage once a day. It was a complete regress of EHIT over the period of 6-25 days in all cases. In 1 (4.8%) case there was nose bleeding without major complications. This patient went on using rivaroxaban. There were no cases of pulmonary embolism.

CONCLUSION Rivaroxaban is an effective medicine for EHIT treatment. The other investigations are needed to point its efficacy and safety.
eP11 FULL ENERGY EFFICIENCY FOR SEGMENTAL ABLATION OF BIG SAPHENOUS VEINS
C. Lebard, F. Zuccarelli
Clinique internationale du Parc Monceau, Paris, France

AIM Radiofrequency (RF) ablation of big great saphenous vein (GSV) needs imperatively high energy deliverance to get high rate occlusion. However, during this performance, it must be ensured and scientifically proven that this level of energy is supportable and not invasive for surrounding tissues. The new software of RF medical VEINCLEAR V1000 generator temperature controlled segmental ablation (RFTSA) calculates accurately energy delivered on each classic cycle of 20 seconds during the procedure. It has also the ability to deliver energy, all at once, during a chosen time till 80 seconds. It has been proved that for big diameters, better efficiency needs a higher level of energy and greater fluence. To appreciate the level of energy necessary to achieve a perfect vein ablation in big great saphenous veins with a diameter of the sapheno-femoral junction between 10 and 15 mm, to define an accurate efficacy fluence, and to assess quality of thermoregulation according to local anatomic conditions: venous aneurisms and tumescence variations.

MATERIALS AND METHODS Since November 2016 to January 2018, 18 limbs with significant GSV reflux were treated for ablation by the RF catheter and V1000 generator VEINCLEAR. The catheter includes a classic 7 cm heating element and a thermocouple regulating temperature at 120°. The new software of RF medical VEINCLEAR V1000 generator calculates accurately energy delivered on each classic cycle of 20 seconds during the procedure. It has also the ability to deliver energy, all at once, during a chosen time till 80 seconds. Operator calculates this heating time depending on the diameter level. All limbs treated were C2 or C3 CEAP clinical class. Energy has been delivered along the GSV as classical RFTSA protocol: At least 3 cycles on the proximal junction and more than one cycle on the lowest saphenous segments. Sometimes one additional cycle has been added on abnormal very large segments. Diameter of SFJ treated was between 11 mm and 15 mm with an average of 12 mm. The average vein length treated was 33 cm.

RESULTS 100% immediate vein obliteration was observed without side effects. Mean total energy delivered on sapheno-femoral junction was 1210 joules /7 cm. Mean LEED was 173 J/cm much higher than the previous protocol indicated. Larger tumescence (600 mL) helped to protect safely surrounding tissues. So, 3 or 4 RF cycles are safe and efficient for ablation of diameters more than 10 mm. Ablation parameters were recorded on USB key. Then, analysis of the graphs of energy, temperature and impedance can be discussed.

CONCLUSION Big GSV are safely occluded by radiofrequency with time of heating between 60 to 80 seconds on the SF-junction and need large tumescence.
AIM To assess the clinical impact of the distance between the site of the initiation of thermal ablation and the saphenous femoral junction (SFJ).

MATERIALS AND METHODS Retrospective analysis of prospectively collected data from consecutive patients who underwent either radiofrequency (RFA) or laser ablation (EVLA) of the greater saphenous vein (GSV). In all patients the fiber tip was positioned precisely distally to the orifice of the superficial epigastric vein. The patients were categorized in two groups according to the distance of the site of the ablation initiation from the SFJ: ≤14.9 mm (group I) and ≥15 mm (group II). Follow-up including clinical examination and duplex scan were performed at 1, 12 and 24 months. Primary outcome was anatomic success defined as absence of reflux or recanalization of GSV. Secondary outcome included thrombosis related complications.

RESULTS A total of 107 ablations were performed (group I=64, group II=43) over a 26-month period. The majority of the patients (84%) were classified as C2 or C3 clinical stage according to Clinical Etiology Anatomy Pathophysiology (CEAP) classification. Seventy-three patients underwent EVLA with a 1470 nm diode laser and 34 patients RFA. Patients’ demographics, CEAP classification, type of ablation (EVLA or RF), mean linear endovenous energy density, average vein diameter and length of ablated vein were similar between the two groups. GSV occlusion rate at 24 months was 90% in group I and 95% in group II (P>0.5). The overall thrombotic complication rate was 5.6%, with comparable rates between the two groups (6.2% vs. 4.6%, P>0.5). Endothermal heat-induced thrombosis was observed in 2 patients in group I and in 1 patient in group II (3.1% vs. 2.3%, P>0.5). One patient in group II developed deep vein thrombosis and 2 patients in group I superficial vein thrombosis. No factors were identified to impact on outcome.

CONCLUSION The distance between the SFJ and the site of the ablation initiation did not have any impact in the outcome as long as the fiber tip is positioned just distal to the orifice of the superficial epigastric vein.
eP13 RETROPERITONEAL ENDOSCOPIC RESECTION OF THE GONADAL VEINS – A NEW METHOD OF TREATMENT FOR PELVIC CONGESTION SYNDROME

Alexander Sazhin, Sergey Gavrilov
Pirogov Russian National Research Medical University, Moscow, Russia

AIM Surgery on gonadal veins (GV) are an effective method of treatment of for pelvic congestion syndrome (PCS). Endovascular embolization is not always feasible due to the anatomical characteristics of the structure of the gonadal veins or undesirable in patients with GV diameter more than 10 mm. Transperitoneal endoscopic method of resection of guards involves the use of pneumoperitoneum, which many authors consider as a risk factor for development of thrombosis in vena cava inferior system. In addition, the tool contact with the abdominal organs, the need of mobilization of the colon for exposure of the gonadal vein at a sufficient for have led to the search for new, safe and highly effective minimally invasive methods of treatment of PCS.

The aim is to evaluate the possibility of retroperitoneal endoscopic resection of the gonadal veins (RER) of the gonadal veins in the treatment PCS.

MATERIALS AND METHODS RER gonadal veins is performed on 6 patients with PCS. Symptoms of the disease served as CPP, discomfort in hypogastrium, dyspareunia. The diagnosis was verified by ultrasonic angioscanning and computed tomography of the pelvic veins. Patients revealed extension of the left guards to 8-11 mm, veins parametrial to 9-12 mm with reflux of blood through these vessels. Surgery was performed in laterobasal the patient on the right side in terms of endotracheal anesthesia. Retrocarboxyperitoneum up to 12 mmHg. punctured with the help of Veress's needle. Through a 2 cm incision was mounted 10 mm port in the access point between the XII\textsuperscript{th} rib and iliac bone, with the help of laparoscope 30° formed retroperitoneal visualize the left gonadal vein. Below XII\textsuperscript{th} ribs, a 5 mm port was installed. Mobilized GV by at least 10 cm and resected it.

RESULTS The duration of the operation ranged from 35 to 40 min. Pain syndrome in the installation of the port did not exceed 2 points (average of 1.5±0.5 points) 1 day after surgery. Postoperative hospital stay was 1.25±0.4. Complications in the immediate postoperative period. CPP decreased from 7.6±1.3 to 0.8±0.35 points. The advantages of this operative technique is the absence of pneumoperitoneum and operating contact with abdominal organs, there is no need to mobilize the blind or the descending part of the colon to perform adequate resection of the guards.

CONCLUSION RER gonadal veins is an effective and safe method for the treatment of patients with PCS.
Thermal Endovenous Therapy is as Effective as Vein Surgery in Achieving Healing of Leg Ulcers Secondary to Superficial Vein Incompetence

Ngoh Chin Liew, Limi Lee, Yan Jun Teoh
Department of Surgery, Faculty of Medicine and Health Sciences, University Putra Malaysia, Serdang, Malaysia

**AIM**  As endovenous therapy progresses, conventional vein surgery has become less relevant in treating varicose veins especially in developed countries. The role of thermal endovenous therapy in healing of venous ulcers is still unclear. There is a paucity of data on venous ulcer healing after thermal endovenous therapy in Cochrane systemic review. The aim of this study was to assess the efficacy of thermal endovenous therapy as compared to surgery in the healing venous leg ulcers secondary to superficial vein incompetence.

**MATERIALS AND METHODS**  Consecutive patients treated with endovenous laser therapy (EVLT), radiofrequency ablation (RFA) or surgery because of a healed or active ulcer between 2010-2017 were identified from a venous registry. Of 133 patients, 20 cases had incomplete record, were lost to follow-up or uncontactable, leaving 113 patients with 124 ulcers for assessment. Ninety eight (79%) ulcers out of the 124 were intervened because of primary superficial venous incompetence. The remainder 26 (21%) were managed with compression due to post thrombotic syndrome, deep vein incompetence and Iliac vein obstruction.

**RESULTS**  Ninety-eight patients underwent superficial vein ablation. Mean age of patients was 56 years old. The proportions of patients that underwent EVLT, RFA and Surgery were 30 (30.6%), 34 (34.7%), 34 (34.7%), with ulcer healing achieved in 27 (90%), 31 (91%) and 34 (100%). Ulcers recurrence at some point in the follow-up was 3 (10%), 2 (5.9%), 2 (5.9%) in the EVLT, RFA and Surgery group. Of the ulcers treated with compression alone, 18 (69%) healed, 5 (19%) improved and 3 (12%) remain unchanged or deteriorated. Interestingly in the intervention group, there was preponderance of ulcers on the right leg as compared to those treated with compression alone.

**CONCLUSION**  Venous leg ulcers secondary to superficial vein incompetence are effectively treated with thermal endovenous therapy in achieving complete healing as compared to vein surgery.
eP15 EARLY POSTOPERATIVE PERIOD COMPLICATIONS AFTER MECHANO-CHEMICAL OBLITERATION OF VEINS USING THE FLEBOGRIF SYSTEM

Sergey Markin¹, Ivan Klimchuk², Sergey Kalinin², Nicolai Rogovoi², Yana Gitsuk¹
¹Surgery Department, Russian Academy of Sciences Hospital, St. Petersburg, Russia
²Surgery Department, City Hospital No. 40, Minsk, Belarus

AIM  The introduction of modern methods of treating varicose veins requires a clear account and analysis of specific complications. Nowadays routine practice of mechano-chemical obliteration using the Phlebogriffe system is being actively introduced, though data concerning postoperative period complications is sketchy and fragmentary. The aim of the study was to clarify the nature and frequency of early postoperative period complications after mechano-chemical obliteration of veins using the Flebogrif system.

MATERIALS AND METHODS  The research was carried out in Minsk City Hospital No. 40 and Russian Academy of Sciences Hospital, St. Petersburg and covered the period from November 2016 to January 2018. Mechano-chemical obliteration was performed on 164 patients: 69% women and 31% men. Obliteration of GSV was performed in 79% of the cases, SSV – in 21% of the cases. 3% ethoxysclerol (1 cm³ for 4-5 cm) was used to perform mechano-chemical obliteration. The positioning of the end of the catheter was 1-2 cm from the ostial valve. In the postoperative period, patients were recommended to wear Class 2 compression stockings for 30 days and adhere to high physical activity. Clinical and ultrasound examination of patients was performed 1-2 days following the operation, as well as 1 week and 1.3 and 6 months after the operation.

RESULTS  Dynamic observation of the patients showed no serious adverse events. No episodes of thrombosis of a deep venous system were registered. There were no sensory abnormalities. However, a certain number of patients (0.6%) had an acute pain syndrome some days following the vein obliteration, which required the usage of non-narcotic analgesics. The pain syndrome was completely resolved by the 7th day. Clinically significant manifestations of thrombophlebitis were detected in 28 patients (17.1%) and manifested a different grade of hyperemia and infiltration in the projection of the obliterated vein. This signs were completely resolved in one month by wearing only compression stockings, anticoagulant therapy was not used. Residual infiltration persisted in 16 patients (9.8%) by the end of 1st month. Hyperpigmentation of various manifestations in the projection of the obliterated vein was formed at the end of first week of dynamic observation in 29 patients (17.6%). It was resolved without any trace in 6 months for all the patients.

CONCLUSION  The research showed that mechano-chemical obliteration using the Phlebogritte system caused a number of features in early postoperative period: high frequency of thrombophlebitis, transient hyperpigmentation, infiltration, which distinguishes it from operations of the "gold standard". Informing patients about such results improves the compliance of the therapy.
**AIM** Varicose vein (VV) surgery is the most common vascular procedure in Europe. It is a technique frequently performed by surgeons without vascular specialization. We aim to describe the frequencies and compare the results of VV surgery in Portugal, performed by vascular or general surgeons.

**MATERIALS AND METHODS** Every patient submitted to VV surgery between 2004 and 2014, whose information was contained within the National Administrative Database of Healthcare was included in the study. National Administrative Database of Healthcare is of mandatory registry for hospital refunding. In a random sample of 275 patients (145 from 6 departments of vascular surgery and 130 of 7 departments of general surgery) a phone enquiry was performed to assess 11 parameters before and after the surgery.

**RESULTS** Close to 124,000 patients were identified, 48% were operated by general surgery, 39% by vascular surgeons and in 13% it was not possible to identify the specialty. Nineteen deaths were registered (no differences between groups). In the general surgery group, 15% of patients were hospitalized for 3 or more nights compared to 3% in the vascular group (P<0.001). The evaluation of the 275 phone enquires revealed that patients operated by vascular surgeons have less residual varices (P<0.001), are more satisfied with the surgical scars (P<0.001), are less time absent from work (27 vs. 41 days, P<0.001) and return faster to routine exercise (41 vs. 60 days, P<0.001). In the vascular group, 90% of the patients would again be operated in the future vs. 79% in the general group (P<0.001). The ratio of short vs. long stripping of the great saphenous vein was 57/43 in the vascular group and 15/85 in the general group (P<0.001). Short stripping was associated with less post-operative pain (P<0.001) and a faster return to routine exercise (41 vs. 54 days, P=0.019). A significant and similar improvement in the quality of live assessed by the CIVIQ-14 score was observed in both groups after surgery. The majority (97%) of the inquired patients had a venous ultrasonography performed prior to surgery, but only a subset of patients of the vascular group (15%) had their VV marked with an ultrasound executed in the moment of the surgery. When that occurred, less residual varices (P<0.001) and higher general satisfaction with the surgery were reported (P=0.031).

**CONCLUSION** In the past 10 years, the majority of VV surgery in Portugal has been performed by general surgeons. This study highlights important advantages when it is performed by vascular surgeons. Should this be enough to promote a praxis change?
eP17 THE BURDEN OF DEPRESSION IN PATIENTS WITH CHRONIC VENOUS DISEASE: RESULTS OF AN EPIDEMIOLOGICAL STUDY FROM ROMANIA

Daciana Branisteana1, Toni Feodor2, Iuliana Alma Mitea3, Oana Vittos4

1 University of Medicine and Pharmacy Gr. T. Popa, Iasi, Romania
2 Medical Center for Diagnose, Ambulatory Treatment and Medical Prevention, Surgery Clinic "Sf. Nicolae", Bucharest, Romania
3 Scientific consulting, Servier Pharma, Bucharest, Romania
4 Scientific consulting, Medone Research, Bucharest, Romania

AIM Chronic Venous Disease (CVD) is a debilitating condition with a high prevalence and can substantially affect patients' quality of life (QoL). The impact of newly diagnosed CVD on QoL was not evaluated by other studies in Romania. The aim is to evaluate the burden and impact of depression symptoms by assessing the QoL for adult patients newly diagnosed with CVD addressing to the GP’s office in Romania.

MATERIALS AND METHODS The epidemiological study was conducted in Romania between June-August 2016 and included adult population addressing GPs. The study included only patients which were either newly diagnosed with CVD or previously diagnosed with CVD, without having CVD treatment within the past 6 months prior inclusion. The study collected demographic and clinical data, risk factors, symptomatology, as well as data regarding CVD pharmacological management practice. All patients were invited to complete a questionnaire relating to quality of life (QoL).

RESULTS The study included 110 GPs that recruited 1893 patients (79.1% females), most of them belonging to the age group (51-70 years). The CEAP classification placed most of the patients within C3 class (31.9%), followed by C2 class (28.0%), C1 class (21%) and C4a (8.9%). The reported intensity of the reported CVD symptoms was for most of the patients “low” or “moderate”. In a similar manner, the QoL was affected for most of the patients in “a little” or “moderate” degree, being noticed a significant negative impact on physical, psychological, and social functioning components of QoL, which was correlated with CEAP class (P<0.001).

The QoL were analysed and a significant number of patients reported answers were suggestive of depression; no patient had previously been diagnosed or was on treatment. Among CEAP C3 class patients 37.13% reported as feeling “nervous or tense”, 49.93% reported as being “tired” and 17.8% as being a “burden for others”, 30.37% felt “embarrassed”, 25.79% felt “annoyed” and for 34.53% movement was affected. For CEAP C2 class 28.31% reported as feeling “nervous or tense”, 47.16% reported as being “tired” and 13.31% as being a “burden for others”, 26.98% felt “embarrassed”, 23.77% felt “annoyed” and for 11.88% movement was affected. Data regarding correlation of CEAP class, CVD symptoms and impact on QoL identified a significant correlation between all analyzed components (P<0.001).

CONCLUSION Depression symptoms were present in a significant number of CVD patients, where it was commonly undiagnosed and untreated. Additional research and an integrated approach to patients diagnosed with CVD is therefore needed, so that the long-term impact of CVD on depression and other quality of life is measured and specific therapeutic interventions are performed in due time.
AIM  Perforating veins (PV) at the medial surface of the thigh are given great importance due to their connection to the great saphenous vein (GSV) and frequent involvement in venous disorders. Less is known about the anatomy and function of the PVs in the popliteal region. The aim is to clarify the clinical anatomy of the PV of the thigh and popliteal region.

MATERIALS AND METHODS  Venous anatomy was assessed in 70 amputated lower extremities by anatomical dissection and in 2800 patients by ultrasonography (US).

RESULTS  Typical localization of PV was: upper third of the thigh where PV emptied into the femoral vein (FV) at the lower edge of the femoral triangle and drained a particular subcutaneous area in 93% of cases; middle third of the thigh where PV emptied into the FV at the level of the adductor canal, and connected GSV and FV in 82.8% of cases; lower third of the thigh where PV emptied into the popliteal vein below the adductor canal and connected GSV and popliteal vein in 82.8% of cases. All PV passed along the medial intermuscular septum and were accompanied by an arterial branch from the femoral artery. The angle of confluence of the perforating and deep veins was approximately 45°, the length of the subfascial part of PV – 5 cm to 7cm. Such features explain lower rates of PV involvement in varicose disease (PV in the lower third of the thigh – 3.5% of cases, middle third of the thigh – 0.5% of cases). However, such anatomy creates a higher risk of introducing a Babcock’s probe into the deep veins in antegrade direction during phlebectomy (0.5% of cases).

PV in the popliteal region may be referred to as “atypical” due to their rare presence (0.4% of cases at US, no cases at anatomical dissection) and absence of the saphenopopliteal junction at the level of popliteal fossa. PV in this area were not supported by the intermuscular septa. PV emptied into popliteal vein at the lateral surface of the calf in 0.34% cases, while the small saphenous vein emptied into the GSV in the upper 3rd of the calf or continued into the Giacomini vein. PVs were accompanied by an artery in all cases.

CONCLUSION  In most cases PVs constitute neurovascular bundles (one perforating vein accompanied by an artery and a nerve).

PV are primarily located along the intermuscular septa, which do not allow them to squeeze, especially under physical stress. Presence of a concomitant artery suggests an additional mechanism of venous outflow via the perforating bundles – an arteriovenous pump.
eP19 VEIN VALVE DEFECTS AND INSUFFICIENCY IN CHILDREN
Johann Chris Ragg, Krastina Stoyanova
Angioclinic Vein Centers, Berlin, Germany

**AIM** Venous insufficiency of the lower extremities is regarded to be a genetically determined, acquired disease. Children have rarely been examined. The incidence of congenital valve defects is commonly estimated below 1%.

**MATERIALS AND METHODS** In an ongoing study, the legs of 65 young relatives of angioclinic vein patients, aged 6-18 (26 m, 39 f) were examined with high frequency ultrasound (Siemens X 700, 12-16 MHz; Vevo MD, 16-32 MHz). Investigation time was limited to 15 minutes.

**RESULTS** In 29/65 children (44.6%), a total of 51 venous pathologies was found: valvular defects of the GSV: 20/65 (32.3%), valvular lesion of SSV: 2/65 (3%), side branch insufficiency GSV: 16/65 (24.6%), perforator insufficiency: 13/65 (20%). The number of findings increased with age, but pathology was already present in 42.8% (3/7, unilateral) in the subgroup of 6-9 y/o (Figure 1). Visual changes of associated superficial veins (diameter increase, more intense colour) were found in 38/65 cases with pathology (58.5%).

Figure 1.

**CONCLUSION** The incidence of detected valve lesions in children was above all expectations, even if taking a bias by case selection into account. Supposed that the acquisition of valvular insufficiency by hypertensive wall stress/dilatation or stasis/inflammation takes decades, the shown pathologies should be best explained by congenital valve defects. New strategies for systematic detection, coaching and adequate therapy have now to be developed.
**AIM**  Varicose veins are estimated to be present in a third of the population, 3-6% of whom will go on to develop venous ulceration as a result. Treatment has changed dramatically over last few years, with interventional treatments being recommended by NICE, as first line. Interventional treatment of varicose veins has been shown to extend the ulcer free time of patients and prevent recurrence.

Many studies have compared the newer interventional treatments to the traditional surgical approach, however there are a lack of detailed studies investigating patient satisfaction and perceived results. As a centre performing a high volume of varicose veins procedures, there was an opportunity for long term follow-up of many patients, focusing on patient satisfaction and any ongoing symptoms and signs, a few years post intervention.

**MATERIALS AND METHODS**  1076 patients were contacted for a telephone interview, conducted by a Vascular Specialist nurse, three to five years post procedure (endovenous laser therapy, foam sclerotherapy or both). 14 questions were asked, relating to their experience and symptoms the preceding two weeks. 508 questionnaires were completed (return of 47.2%). Mean age=61(range 29-96) with a female:male ratio of 349:159.

**RESULTS**  65% (333/508) of patients were symptom free from their treated leg, however only half of symptomatic patients required analgesia (71/141). Only 24 (5%) patients felt their varicose veins still impacted on leisure activities and 22 (4%) on work or daily activities. In spite of these low numbers 30% of patients (142/508) felt concerned by the appearance of their veins and this continued to influence the choice of clothing for over a quarter of patients (128/508). Notably, 19 patients (4%) still have eczema or a rash and 4 patients have ulcers. Just over a fifth of patients (110/508=22%) have considered seeing their GP due to their veins. Overall, 96% felt they received good or excellent treatment from our centre.

**CONCLUSION**  Varicose vein treatment has a massive impact on patients, both physically and psychologically. Our results show only a small number of patients are negatively impacted physically in the long term, following their varicose vein intervention, which is a positive result. We weren’t however expecting such a huge number to be affected psychologically, this far down the line. Currently we don’t routinely follow-up patients but these figures would suggest a need for it, perhaps later in the postoperative course than is traditional for other surgeries. Further investigation is needed surrounding this. Additionally, with 23 patients still affected by skin changes, it begs the question, should we be intervening earlier? A topic for further study.
eP21 ANATOMICAL CHARACTERISTICS OF THE MOST IMPORTANT PERFORATING VEINS OF THE CALF, ANKLE, AND FOOT

Igor Suchkov¹, Roman E. Kalinin¹, Ivan Shanaev², Nina D. Mzhavanadze¹
¹ Ryazan State Medical University, Ryazan, Russia
² Ryazan Regional Clinical Cardiologic Dispensary, Ryazan, Russia

AIM Precise knowledge of venous anatomy is essential for phlebologists. The aim is to clarify the clinical anatomy of the perforating veins (PV) of the calf, ankles, and foot.

MATERIALS AND METHODS Anatomy was assessed in 70 amputated lower extremities by anatomical dissection and in 2800 patients by ultrasonography.

RESULTS There were 4 to 6 PV at the medial surface of the foot. They were located along the medial intermuscular septum and were directly connected with the medial marginal vein and vv. plantaris medialis (VPL). 2 to 3 PV were found at the lateral surface of the foot. They directly connected the tributary of the lateral marginal vein (which together with the main trunk of the lateral marginal vein formed small saphenous vein) and vv. plantaris lateralis (VPL). Topographically PV passed behind the lateral muscle group of the foot along the lateral intermuscular septum. Moreover, both PV had tributaries, which drained the subcutaneous tissues of the lateral and medial surfaces of the foot.

Anatomically, the region of the medial malleolus corresponds to the calcaneal canal. Vv. tibialis posterior (VTP) were formed by the confluence of VPL and VPM at the bottom of the canal; slightly below this level a relatively large PV emptied into VPL, draining the subcutaneous adipose tissue of the heel region. 2 to 3 PV up to 0.5 mm in diameter emptied into VTP in the upper part of the canal.

Presence of the muscle-venous pump in the lower leg complicates the structure of the perforating veins, which include direct, indirect, and mixed PV. Among all of the PV the most clinical important ones are localized on the medial surface of the calf and empty into VTP. The most constant were PV located at a distance of 7-10 cm, 11-16 cm above the lower edge of the medial ankle. According to the results of anatomical dissection all of them were the main vessels draining subcutaneous adipose tissue of the medial ankle region. Topographical features of the PV relative to muscles, deep leaf of the fascia, and sural veins characterize their localization as an area with increased hemodynamic load, but, in fact, with a poorly established muscular fascia. Each PV of the calf (direct and indirect) and the foot was accompanied by an arterial twig, and it was often possible to identify a twig from a nearby nerve. Interestingly, there were 2 perforating veins in the subfascial area, located on sides of the artery.

CONCLUSION PV constitute the neurovascular bundles. PV are primarily located along the intermuscular septa.
AIM
It is well known that following classic surgery of varicose veins there are many recurrent cases, which according to Perrin at al. is about 20% after 5 years. Now we are dealing with recurrent varicosities where classic crossectomy and stripping had been performed earlier.

MATERIALS AND METHODS
In the last 10 years a total of 1483 laser surgical interventions were performed by us. In 127 limbs (9.2%) recurrent varicosity was operated on with laser surgery. Now we are dealing with the following forms of recurrences: 1) long saphenous stump and dilated SFJ tributary when the accessory anterior or rarely posterior becomes varicose; 2) neovascularisation was seen mainly in those cases where a perfect crossectomy had been done before; 3) patent ligature of the SFJ which caused a slightly dilated GSV and tributaries along the leg, with no or minimal complaints; 4) recurrency from pudendal perforator vein in women who had delivered children; 5) dilated and tortuous Dodd perforator vein.

MATERIALS AND METHODS
In every case laser surgery was performed in combination with other methods, such as foam sclerotherapy and phlebectomy. Laser (KLS Martin 1550 nm, linear, one or two ring fibre) was used for the occlusion of the SFJ and/or saphenous stems and/or perforator veins. A lower amount of energy was given to the saphenous stem and a higher one to the SFJ. To the subjunctional 3 cm long segment 268 J/cm (SD±38.6) was delivered. To the stem 3 cm from the SFJ and distally 84 J/cm (SD ±15.3) was given. Treatment of the SFJ was begun 0.5 cm below the femoral vein. To prevent heat leakage into the femoral vein, compression of the femoral opening of the saphenous vein with cold (4 °C) tumescent anaesthetic solution was given. Delivered energy for perforator veins was between the junctional and stem energy level (187 J/cm±29.7). In SFJ neovascularisation and pudendal perforator insufficiency cases, foam sclerotherapy was used to close the source of recurrency. Other insufficient perforator veins (Dodd, Cockett, anterior, etc.) were occluded with laser using bare fibre.

RESULTS
58% of operated cases (861) were followed for longer than one year, mean 3.5 years. After surgery every laser-treated segment was closed. In recurrent cases 11.9% re-recurred and in selected non-recurrent cases it was 6.0%.

CONCLUSION
In the treatment of recurrent varicosities, laser proved to be effective. A combination of laser, foam and phlebectomy seems to be useful. Re-recurrence in these cases was about twice as high as in selected ones.
Endoluminal Occlusion Foam Therapy (ENOF) on Great Saphenous Veins: Occlusion, Failure, and Other Outcomes

José Daniel Guerra¹², Mariana Soto¹³, Ana Cristina Montenegro¹⁴, Pedro Iván Navarro⁵, Jorge Hernando Ulloa¹²
¹Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá, Colombia; ²Facultad de Medicina Universidad de los Andes. Bogotá, Colombia; ³Facultad de Medicina Universidad del Bosque, Bogotá, Colombia; ⁴Facultad de Medicina Universidad de Antioquia, Bogotá, Colombia; ⁵Magister en Epidemiología

**AIM** Estimate primary, late primary and secondary occlusion rates as well as failure after ENOF treatment of the great saphenous vein.

**MATERIALS AND METHODS** A sample of 291 extremities with great saphenous vein insufficiency treated with ENOF between January 2013 and August 2015 at Hospital Universitario Fundación Santa Fe de Bogotá was analyzed retrospectively. 1% Lapidium Chlorhydrate foam prepared using Tessari Technique with a mixture of CO₂-O₂ was administered. Follow-up controls were ordered on day three and months one, three, and six. During controls, venous ultrasound was performed evaluating anatomic occlusion. On non-occluded veins, sclerotherapy was re-administered.

**RESULTS** Primary occlusion was achieved on 70 extremities (82.3%), late primary on 9 (10.6%), secondary on two (2.35%), and failure on four extremities (4.71%). Total occlusion percentages at months one, three and six were 96%, 97%, and 95% respectively. A statistically significant association (P=0.003) was found between the CEAP clinical classification and occlusion type. A total of 56 events occurred: 43 (14.7% of the extremities) events of superficial thrombosis, 5 (1.7% of total extremities) post-sclerotherapy ulcers, 4 (1.38%) events of pain, and isolated events of dyschromia, hematoma, edema, and matting (0.34% each).

**CONCLUSION** A high percentage of extremities with saphenous vein insufficiency treated with ENOF achieved anatomic closure in a safe way. Prospective studies that consider the association between clinical CEAP classification and occlusion type are desirable for further research.
AIM    Iliocaval compression in retroperitoneal fibrosis (RPF) can result in lower limb swelling, discomfort, venous claudication, varicose veins, skin changes or tissue loss. If there are significant symptoms then intervention is often indicated. This retrospective study reports a tertiary centre’s experience of managing patients with iliocaval disease in RPF.

MATERIALS AND METHODS    A retrospective analysis of all patients presenting to a tertiary unit with a diagnosis of RPF was performed from computerised records. The study period extended from January 2013 to January 2018. Data was analysed for demographics, interventions, stent patency and procedural complications.

RESULTS    A total of 213 patients with RPF were identified of which 18/213 (8.4%) had iliocaval (IVC) occlusion as a consequence. The median age of patients with IVC involvement was 60 years (range 47-83 years) of which 11/18 (61%) were male and these patients presented with significant disabling lower limb swelling with one patient presenting acutely with DVT. Of the 18 patients 7 (39%) have subsequently undergone intervention to reconstruct the IVC. RPF was caused by Ig4 nephropathy in 6 (33%) and was idiopathic in the remainder. In all patients no reconstruction was attempted until the RPF was considered quiescent and all patients underwent the procedure under steroid cover in addition to standard anticoagulation strategies. The majority of patients underwent reconstruction using double barrel technique with Veniti Vici™ stents (5/6) and Sinus XL™ was used if the stent extended into the supra-hepatic portion of the IVC in (2/6). The occlusion was successfully crossed in 6/7 (86%). Primary, Primary–assisted and Secondary patency are 67%, 100% and 100% respectively at 12 months with a median follow-up of 15 months (2 months to 27 months). Significant symptomatic improvement was noted in all patients who underwent treatment with resolution of swelling in all and additional complete resolution of back pain in 2/7. Back pain had previously been considered to be a consequence of the RPF process causing nerve involvement and this is a new finding.

CONCLUSION    IVC involvement is a rare but significant complication of RPF. IVC reconstruction is technically feasible and can lead to significant symptomatic improvement with acceptable patency in these patients.
eP25 VENOUS INSUFFICIENCY TREATMENT AND THE EFFECT ON QUALITY OF LIFE
Malin Öster¹, Oskar Nelzén²
¹ Örebro university, Örebro, Sweden
² Department of Thoracic and Vascular Surgery, Linköping University, Linköping, Sweden

AIM

Venous insufficiency is a widespread problem, which can affect patients both physically and psychically. Many patients seek public healthcare wanting treatment. In many counties only patients with skin changes are eligible for treatment. The aim of this study is to examine health-related quality-of-life in patients with superficial venous insufficiency pre- and postoperative at Linköping University Hospital.

MATERIALS AND METHODS

Hundred patients with duplex verified great saphenous vein insufficiency were randomized to either high ligation and stripping (n.=49) or radiofrequency ablation (n.=51). They were examined pre- and postoperatively regarding perceived health-related quality-of-life using Aberdeen Varicose Vein Questionnaire (AVVQ) and Euro-QoL 5 domain Descriptive system (EQ-5D), they were clinically graded according to C in Clinical Etiologic Anatomic Pathophysiologic (CEAP) classification.

RESULTS

Patients significantly improved health-related quality of life according to both questionnaires after treatment. EQ-VAS mean score improved from 67 vs. 83 (24%) (P<0.0001), EQ-index mean score improved by 10% one month post-surgery (P<0.0001) and continued to improve by one year compared to after one month (P<0.0001). Pain and discomfort were reported by 90% of the patients preoperatively, which decreased to 32% one year post surgery. AVVQ mean score decreased after treatment 24 vs. 11 (54%) (P<0.001). None of the interventions gave significantly better results than the other in any of the questionnaires. When comparing patients with mild clinical disease (C in CEAP 2-3) vs. patients with C4-6 the C2-3 patients reported lower preoperative scores 58.6 vs. 75 (P<0.0002) using EQ-VAS, 1 month after treatment EQ-VAS did not show any significant difference 82.3 vs. 83.1 (NS). When using AVVQ no significant difference between C2-3 vs. C4-6 was seen pre- or postoperatively but the patients in C2-3 group showed greater symptom reduction (preop. C2-3: 23; C4-6: 24 (NS)) v.s. (postop. C2-3: 8; C4-6: 14 (P=0.03)).

CONCLUSION

Venous insufficiency is a disease that despite mild clinical signs can have a large impact on patients’ health-related quality of life. Invasive treatment was an effective tool for symptomatic improvement in this study population, regardless of clinical burden. According to these findings patients’ self-reported quality of life is an important part of the clinical assessment for these patients and those with mild clinical disease can experience symptoms as severe as patients with skin changes. Improved methods could provide the ability to identify the patients who benefit most from the treatment.
eP26 CHRONIC VENOUS DISEASE AND HEMORRHOIDS: IS THERE ANY ASSOCIATION? RESULTS OF THE RUSSIAN PART OF INTERNATIONAL PROGRAM CHORUS

Alexey Bogomazov1, Evgeny Golovko2, Evgeny Zagryadsky1, Nikita A. Shichkin4

1 Medical center "South", Moscow Russia
2 Clinic «MEDSI MSK 12», Moscow, Russia
3 Medical Center «ON-CLINIC», Moscow, Russia
4 Clinical Hospital #9, Yaroslavl', Russia

AIM To assess the possible concomitance between hemorrhoidal disease (HD) and chronic venous disease (CVD) of the lower limbs.

MATERIALS AND METHODS From October 2015 to March 2016, a multicentre observational study was conducted as a part of the CHORUS (Chronic venous and Hemorrhoidal diseases evaluation and Scientific research) international research program. The study was carried out in 9 centers in different regions of the Russian Federation with the participation of 80 coloproctologists. The presence of concomitant CVD was registered in the case report form on the basis of complaints and clinical examination of patients according to the (Clinical Etiological Anatomic Pathophysiology) CEAP classification.

RESULTS The study included 2668 patients, 1230 males (46.1%) and 1438 females (53.9%), with a mean age of 44 years (range 18-92 years) and a mean BMI of 26.0±4.6 kg/m². CVD of lower extremities was diagnosed in 59.7% of the patients. Among patients with HD grades I, II, III and IV, the proportion of patients with CVD was 45.2%, 62.0%, 66.9% and 76.8%, respectively. When considering patients with venous leg problems, more than half (53.8%) had recurrent HD versus only 35.9% among those without any venous leg problems (P<0.0001). Furthermore, patients with severe venous leg problems (C5-C6 CEAP classes) were more prone to have previously consulted for hemorrhoids.

CONCLUSION In this study, the proportion of patients with CVD clearly increased with the severity of HD, indicating a possible relationship between HD and CVD. In addition, results suggest a potential link between the recurrence of hemorrhoids and the emergence of venous leg problems. The possible relationship between the two pathologies should be taken into account in the examination of patients and for the development of therapeutic guidelines. Further studies should be encouraged to investigate the complex relationship between HD and CVD.
A CASE-CONTROL STUDY ASSESSING THE CALF MUSCLE FUNCTION BY NEAR-INFRARED SPECTROSCOPY IN PATIENTS WITH SUPERFICIAL VENOUS INSUFFICIENCY AND DEEP VENOUS THROMBOSIS

Spyros Vasdekis, Konstantinos Antonopoulos, Vassilios Zymvragoudakis, Andreas Lazaris
Department of Vascular Surgery, University of Athens Medical School, “Attikon” University Hospital, Athens, Greece

AIM  Near-infrared spectroscopy (NIRS) is a form of non-invasive technique that applies near-infrared radiation to tissues to measure differential absorption. By monitoring changes in absorption, NIRS has been proposed as a novel tool that allows for real-time assessment of the adequacy of tissue perfusion and determine the degree of tissue oxygenation. We investigated its role in detecting calf muscle pump dysfunction in patients with superficial venous insufficiency (SVI) and deep venous thrombosis (DVT) and among controls.

MATERIALS AND METHODS  We staged all patients according to the CEAP classification system for chronic venous disorders (clinical class, etiology, anatomy, and pathophysiology). The control group consisted of healthy volunteers with no history of venous thrombosis and no evidence of clinical venous disease (GROUP variable). We thereafter recorded corresponding values of calf regional oxygen saturation (crSaO$_2$,%) after each stage of a 10-stage evaluation of ambulatory venous function (TIME variable). Differences among groups and phases were evaluated using analysis of variance (ANOVA). We tested the best predictive capability for SVI and DVT by estimating the area under the curve (AUC) after receiver operating characteristic curve (ROC) analysis.

RESULTS  Our cohort comprised of 30 patients with SVI, 31 patients with DVT, and 34 controls. Repeated-measures ANOVA showed a statistically significant effect of TIME (P<0.001), indicating significant differences among the different phases of ambulatory venous function when each group of patients was studied alone. Additionally, we found a significant TIME x GROUP interaction (P<0.001), indicating significant differences in crSaO$_2$ among the three groups. We also recorded a statistically significant AUC for SVI (P=0.003) and DVT (P<0.01).

CONCLUSION  Use of NIRS to detect alterations in calf muscle pump oxygenation during exercise and among SVI patients, DVT patients, and controls seems to be a non-invasive and reliable tool. Larger studies are needed to detect potential differences among different CEAP stages.
In the venous practice, it is not uncommon to see patients with advanced venous disease with truncal competence or incompetence with small size great saphenous vein (GSV). This situation provides a tricky conundrum of whether the superficial vein incompetence be treated or not. The aim of this study was to look at GSV size in patients with advanced stage of venous disease and to establish a correlation between vein size, superficial reflux and deep vein reflux (DVR).

The primary objective was to study if there was a correlation between GSV size, reflux, deep venous pathology and advanced venous disease. The secondary objectives were to assess if vein size correspond to incompetence and if deep venous reflux contributes to superficial vein size.

This was a prospective study done in a single-centre from April 2016 to March 2017. Patients who presented with severe venous insufficiency (CEAP C5 and 6) were included. Exclusion criteria included non-detailed Doppler examination and previous surgery for varicose veins.

The Duplex findings were documented and complemented with ascending venogram to assess the deep veins. Analysis was done to assess truncal incompetence, deep venous reflux, superficial vein size and deep veins pathology with venogram.

A total of 79 limbs from 65 patients were enrolled into the study. The mean sapheno-femoral junction (SFJ) and GSV size was 8.3 and 6.5 mm respectively. There was no statistical difference in the SFJ and GSV size among patients with incompetence when compared to patients with competent junctions. The presence of DVR did not make a statistical difference to the SFJ nor the GSV size. 93% of patients (14/15) with no incompetence and advanced disease showed positive findings on ascending venogram.

Patients with advanced disease can have small superficial veins. Junction and vein size may not correspond to advanced stage of disease. The incidence of iliac vein pathology as indicated by an abnormal venogram is high in patients with advanced disease. In patients with competent SFJ and advanced CVI, the deep vein may be the cause. If the clinical stage of venous disease does not correspond to duplex findings, it may be prudent to look at the deep veins closely. Other methods to quantify reflux, the use of plethysmography and IVUS is ideal.
eP29 AREA VERSUS DIAMETER CT MEASUREMENTS FOR MAY-THURNER SYNDROME: HAVE WE BEEN MEASURING IT ALL WRONG?

Vassilios Zymvragoudakis¹, Konstantinos Palialexis², Stavros Spiliopoulos³, Constantine Antonopoulos⁴, Christopher Lattimer⁵, George Geroulakos⁶

¹ Department of Vascular Surgery, Attikon University General Hospital, Athens, Greece
² Interventional Radiology Unit, Second Department of Radiology, Attikon University General Hospital, Athens, Greece
³ Interventional Radiology Unit, Second Department of Radiology, Attikon University General Hospital, Athens, Greece
⁴ Department of Cardiothoracic and Vascular Surgery, Evangelismos General Hospital, Athens, Greece
⁵ Department of Surgery and Cancer, Imperial College, London, UK
⁶ Department of Vascular Surgery, Attikon University General Hospital, Athens, Greece and Department of Surgery and Cancer, Imperial College, London, UK

AIM In the majority of publications investigating May-Thurner syndrome as a risk factor for deep vein thrombosis or its clinical significance in chronic venous disease, measurements have been performed in axial computed tomography (CT) images. However, area measurement obtained by intravascular ultrasound (IVUS) is considered in current practice the gold standard for assessing these lesions. The aim is to investigate potential differences between assessment of stenosis in May-Thurner syndrome by measurements of diameter versus area measurements in CT imaging.

MATERIALS AND METHODS This was a retrospective study that included the first 50 consecutive outpatients with evidence of May-Thurner syndrome in pre-scheduled abdominal contrast-enhanced CTs, performed for reasons unrelated to venous disease. Patients with history of deep venous thrombosis were excluded. Three measurement techniques were employed: 1) diameter measurement in axial CT images; 2) diameter measurement in multiplanar reconstructions (MPR) orthogonal to the line of blood flow; 3) manual measurement of the cross-sectional area in reconstructions orthogonal to the line of blood flow. The percentage of compression of the common iliac vein was measured by comparing it with the diameter/cross sectional area measured above the ipsilateral confluence of the external and internal iliac vein. Differences among the three methods of assessment were assessed by analysis of variance (ANOVA).

RESULTS ANOVA showed statistically significant differences among the three methods of assessment (F=121.7, P<0.001). More specifically, mean degree of stenosis assessed by axial imag-
ing (54.8±12.9%) was significantly higher compared to mean degree of stenosis assessed by area (20.2±14.2%; P<0.001. Similarly, mean degree of stenosis assessed by MPR (51.5±9.1%) was also higher than mean degree of stenosis assessed by area (P<0.001). No statistically significant difference was found between mean degree of stenosis assessed by axial imaging and MPR (P=0.54).

**CONCLUSION** Diameter measurements in CT scans for assessment of May-Thurner syndrome tend to overestimate stenoses when compared to area measurements. Area measurements may provide a more accurate method of assessing these lesions and should be validated against other methods, such as IVUS.
eP30 VENOUS CIRCULATION DISORDERS: RESULTS OF A STUDY CONDUCTED ON A GLOBAL REPRESENTATIVE SAMPLE OF PATIENTS FROM 8 COUNTRIES

Catherine Regnier1, Vishal Sanduja2, Sophie Labat3, Fabienne Goron3, Ghislaine Salmat4
1 Servier International, Suresnes, France
2 HEC Paris, France
3 Harris Interactive, Healthcare Department, France
4 Harris Interactive, Data processing and statistics Department, Paris, France

AIM This study was conducted to develop a deeper understanding of Chronic Venous Disorders and Hemorrhoid Disease in terms of prevalence and description of patient profiles, by surveying a representative sample of patients on their specific symptoms.

MATERIALS AND METHODS The study was conducted by Harris Interactive SAS with participants recruited by Harris Poll Online Panel through registration Website. Data were collected from national representative samples using the quota method in terms of gender, age and regions in Brazil, Czech Republic, France, Hungary, Italy, Romania, Russia and Spain. General eligibility criteria were: a) age greater than or equal to 18 years; b) ability to read and speak local language; c) resident of the country. In addition, participants were further subgrouped if they: d) suffer or have suffered from varicose veins and/or heavy-tired-swollen legs problems and/or hemorrhoids in the last 12 months; e) suffered from these pathologies at least twice a year; f) reported specific pre-defined symptoms. Data on demographics, lifestyle and history of pregnancy were also recorded for general population as well as the subgroups.

RESULTS The general population (GP) consisted of 16015 solicited and respondents, of whom 3530 (22%) suffered from heavy-tired-swollen legs problems and/or varicose veins (heavy legs subgroup, HL) and 1725 (11%) from hemorrhoids (HD-Hemorrhoids disease subgroup). In total, 4438 (28%, of which males-38% and females-62%) suffered at least from one of the two disorders and out of them 817 (5%) suffered from both. The proportion of women in these subgroups was higher as compared to that in GP (HL: 66%; HD: 56% vs. GP: 52%). In comparison with GP, HL or HD subgroups had a higher average age (HL: 46.9; HD: 46.4, vs. GP: 44.9 years.) and a higher number of overweight with BMI ≥25 kg/m2 (HL: 58%; HD: 55% vs. GP: 52%). Higher proportion of respondents in HL had a daily activity which involves “frequently, almost constantly or constantly standing” than in other groups (HL: 47% compared to HD: 43% and GP: 43%). Women with a history of pregnancy were more represented (HL: 75%, HD: 81% vs. GP: 68%). Average number of co-morbidities including among others, allergy, depression and hypertension was higher in both subgroups than in GP (GP: 1.32; HL: 2.86 and HD: 3.13).

CONCLUSION In this large scale survey of a sample which is representative at a global level, 28% of the respondents reported suffering or having suffered from varicose veins and/or heavy-tired-swollen legs and/or hemorrhoids in the last 12 months. The research also provided deeper insights into the lifestyle, socio-demographics, symptoms, history of pregnancy for such patients.
AIM  
To assess the reduction of symptoms and signs of premenstrual transient phlebopathy of the lower limbs, including the premenstrual transient reflux in the great saphenous vein (GSV), using treatment with micronized purified flavonoid fraction (MPFF).

MATERIALS AND METHODS  
This observational prospective study enrolled women class C0s or C1s using the Clinical Etiological Anatomic Pathophysiologic (CEAP) classification, with leg pain before menstruation at usual daily loading and absent at the beginning of the cycle, and a stable menstrual cycle. Parameters measured were: leg pain and leg heaviness using a 10 cm Visual Analog pain (VAS), leg circumference, GSV reflux and diameter at 1 cm from the saphenofemoral junction by duplex ultrasonography using a day orthostatic load test. Patients received MPFF as intermittent 15-day courses with a single 1000 mg daily dose, starting 15 days before menstruation. Pre-treatment data were collected during the menstrual and secretory phases. To evaluate MPFF effectiveness, results during the secretory phases before and after 3 months of treatment were compared.

RESULTS  
28 women (mean age±SD: 29.3±7.8 years) with leg pain before menstruation (mean VAS: 5.2, 95% CI, 4.7-5.7) were included. In the secretory phase, compared to the menstrual phase: i) mean leg circumference increased in the supramalleolar region by 6.8 mm (95% CI, 6.31-7.32) and in the muscular part of the calf by 9.7 mm (95% CI, 9.20-10.2); ii) evening GSV diameter increased significantly (P<0.0001) from 5.1 mm (95% CI, 4.82-5.39) to 6.0 mm (95% CI, 5.74-6.33); iii) GSV reflux was absent in all women in the menstrual phase. In the secretory phase, 16 women (57.1%) had a morning GSV reflux and 25 (89.3%) had an evening GSV reflux. When comparing results in secretory phases before and after MPFF treatment: i) leg circumference decreased by 3.2 mm (95%CI, 2.9-3.5) in the supramalleolar region and by 2.6 mm (95% CI, 2.2-3.0) in the muscular part of the calf (both P<0.0001); ii) evening GSV diameter decreased to 5.3 mm (95% CI, 4.98-5.52) (P<0.0001); iii) morning GSV reflux was absent after MPFF treatment and only 6 women (21.4%) had evening GSV reflux. The number of women with leg heaviness decreased from 28 (100%) to 4 (14.3%), and the intensity of leg heaviness (VAS) was also reduced from 5.2 (95% CI, 4.7-5.7) to 0.3 (95% CI, 0.0-0.6) (P<0.0001), after MPFF treatment.

CONCLUSION  
In women with premenstrual transient phlebopathy, intermittent 15-day courses of MPFF treatment, starting 15 days before menstruation, are associated with a reduction in leg circumference and in the intensity of leg heaviness, a decrease in GSV diameter and a reduction of the premenstrual transient GSV reflux.
eP32 ADHERENCE TO NONOPERATIVE TREATMENTS IN OUTPATIENTS WITH CHRONIC VENOUS DISORDERS: RESULTS OF VEIN ACT PROGRAM

Jorge Ulloa Dominguez, Vadim Yu Bogachev, Sorin Baila, Johannes Walter, Andrès Marin, Dale Maharaj, José Manuel Jimenez Arribas

1 Vascular Surgery Fundación Vascular de Colombia, Bogota, Colombia
2 Pirogov Russian National Research Medical University, Moscow, Russia
3 Vascular surgery department “C.C. Iliescu” Cardiovascular Disease Emergency Institute, Bucharest, Romania
4 Department of Vascular Surgery, Salzburg, Vienna, Austria
5 Hospital Metropolitano de Santiago Santiago, Santiago Dominican Republic
6 Caribbean Vein and vascular clinic St Clair Medical Hospital Port of Spain Trinidad
7 Division of Vascular Surgery, Hospital San Juan de Dios, Pamplona, Spain

AIM
The Vein Act Program (VAP) was an international, observational, prospective, multi-center survey endorsed by the European Venous Forum and designed to assess patients’ adherence to nonoperative treatments and their effects on chronic venous disorders (CVD) symptoms.

MATERIALS AND METHODS
The program, performed in 7 regions (Russia, Spain, Romania, Colombia, Austria, West Indies, and Central America) between 2013 and 2017, involved adult outpatients with pain in the lower limbs who consulted general practitioners or specialists (mainly vascular surgeons) for any clinical presentation related to CVD. The patients underwent a clinical examination of the lower limbs to identify the CVD signs using the Clinical Etiological Anatomic Pathophysiological (CEAP) classification. A case report form was completed listing the patient’s clinical presentation, symptoms, and the intensity of symptoms using a 10-cm visual analog scale (VAS) and adherence to prescribed medication. After this first visit (V0), patients were asked to return for a follow-up visit (V1).

RESULTS
A total of 7987 subjects were enrolled, of whom 7397 had complete data at baseline for main variables and at least one data reported at follow-up visit V1: they were the focus of the results reported here. The mean time between visits V0 and V1 was 80 days. Nonoperative treatments were prescribed to 78% of the patients, whereas 22% were prescribed both operative and nonoperative treatments. The nonoperative treatments consisted of venoactive drugs (VADs) (99%), lifestyle advice (94%), compression therapy (68%) and/or pain killers (10%). The main VAD prescribed was Micronised Purified Flavonoid Fraction (MPFF) (76%).

The prescription duration of VADs was at least 8 weeks in most of the patients (66%). Of the patients prescribed VADs, 65% were adherent to the prescribed duration of treatment and the majority of them (87%) took the prescribed dosage. Similarly, 66% of the patients were adherent to the prescribed duration of MPFF, a majority of them using the prescribed dosage (88%). Adherence to treatment was particularly high (76%) in patients prescribed MPFF for 2 to 8 weeks. The main reason cited for non-adherence to VADs and MPFF was forgetfulness.

Compression therapy was prescribed mainly at mild to moderate strength (80% of the patients prescribed compression) and for at least 8 weeks (71%). Only 29% of patients wore their compression therapy as prescribed, the remainder reported that they wore it most of the days (28%), intermittently (23%) or not at all (10%). The main reasons for non-adherence to compression therapy were related to: discomfort, difficulty in wearing and sweating.

CONCLUSION
In outpatients with CVD from different therapeutic zones worldwide, VAP demonstrated a high adherence to venoactive drugs, mainly MPFF (66%). Adherence to compression therapy was much lower, with only 29% of patients wearing it as prescribed.
eP33 VENOUS BED TRANSFORMATION AFTER THE ELIMINATION OF PATHOLOGICAL REFLUX IN THE GREAT SAPHENOUS VEIN ON THE LEVEL OF THIGH: 3-YEAR RESULTS

Elena Burleva1, Sergey Turin2, Oleg Smirnov3, Rinat Fashiev4
1 Department of general surgery, Ural State Medical University, Ekaterinburg, Russia
2 Department of vascular surgery, City Clinical Hospital №40, Ekaterinburg, Russia
3 Medical center "Olmed", Ekaterinburg, Russia
4 Department of roentgen diagnostics, City clinical hospital №40, Ekaterinburg, Russia

AIM of the study is clinical and ultrasound assessment of patients with varicose veins disease after the elimination of pathological reflux in GSV on the level of thigh during 3 years of postoperative supervision.

MATERIALS AND METHODS 185 patients (185 cases) with GSV system varicose vein disease classes 2 and 3 (CEAP): 73 (39,4%) men, 112 (60,5%) women. All the patients passed through clinical examination with complaint estimation according to VCSS scale and duplex sonography. For sonography there were considered the length of pathological reflux, GSV diameter on the level of sapheno-femoral junction, trunk diameter in the middle third of lower leg and quantity and diameter of perforating veins. Patients were divided in 3 groups. 1st group (n.=63) – short stripping of GSV trunk + treatment of perforators (66,7%). 2nd group (n.=61) – endovenous laser ablation (EVLA) of GSV trunk + EVLA of perforators (73,7%). 3rd group (n.=61) – radio frequency obliteration of GSV trunk + EVLA of perforators (70,4%). In post-operative period similar groups of patients were chosen to appreciate VCSS scale data and duplex sonography parameters within 3 years on an annual basis. Statistical analysis – Microsoft Excel for Windows XP, MedCalc® (version 11.4.2.0., Mariakerke, Belgium).

RESULTS Pathological reflux in GSV trunk on the lower leg: 1st group after 1 year – 33,3%, after 2 years – 36,3%, after 3 years – 39,1%; 2nd group, same periods – 15%; 14,2%; 25%; 3rd group – 11%; 18,1%; 23,8%. In the 1st group after 1 year the appearance of vertical refluxes in GSV tributaries of the thigh was registered in 22% of cases, the presence of new horizontal refluxes in perforating veins – in 44,1% of cases. In groups 2 and 3 in the absence of new vertical refluxes on the thigh there was registered the appearance of incompetent perforating veins after 1 year – 11-15%, after 3 years – 40% of cases. A half of incompetent perforating veins in these groups were connected directly to the GSV trunk of the lower leg. GSV trunk diameter on the lower leg was significantly growing each year in all groups. 1st group – from 3.2±1.4 mm to 4.0±0.6 mm (P=0.02); 2nd group – from 2.9±1.24 mm to 4.1±0.5 mm (P=0.01), 3rd group – from 2.7±0.8 mm to 4.2±0.4 mm (P=0.03). The average diameter of perforating veins was increasing in the similar supervision period.

CONCLUSION Received data show the progress of varicose vein disease in a part of operated patients, and it demands dynamic supervision and systematic pharmacotherapy.
AIM There is a general agreement among phlebologists worldwide: ultimately the cause of a venous ulcer is the high pressure in a superficial vein straining the microcirculation of the skin. By Duplex you may investigate a lot of parameters such as the exact position of the vein, its diameter, thrombosis or not, direction and velocity of flow etc. except the measurement of the pressure… but you are able to detect the source of the local venous hypertension. “Sourcing-technique” is our standard investigation and basis of hemodynamical ulcer treatment since 1997, long-term results were published 2006 in JVS. Motivated by Prof. Hugo Partsch we specifically published this method in JVS 2012. We are still pleased with the positive international reactions by colleagues.

MATERIALS AND METHODS In addition to usual routine duplex examination we use the “Sourcing-technique” to detect superficial reflux routes responsible for/connected with an ulcer using the following provocation maneuver: soft manual compression of the ulcerated area evacuates capillaries and veins below and around the ulcer by elevating the venous blood column. Immediately after release the blood column swings back (reflux) and leads to a pressure peak in this area. This swinging blood column is easily to follow by probe to its proximal origin. The examination is performed from distal to proximal in standing or sitting position. We differentiate between two types of reflux: Axial reflux in a classic pattern exists when GSV reflux or insufficient medial calf perforators lead to a medial ankle region ulcer, or SSV to the lateral ankle. Crossover patterns are those with “extraterritorial” ulcer locations.

RESULTS It is surprising that lateral located ulcers are powered cross over in 46% by GSV, medial ulcer in 11% by SSV. 20% of ulcer patients show no visible varicose veins. In a retrospective series of 512 retractable ulcers amazingly 91% achieved healing following Ultrasound Guided Foam Sclerotherapy (UGFS) of “Sourcing-positive” reflux routes and compression.

CONCLUSION “Sourcing-technique” is helpful in identifying responsible terminal reflux routes of venous ulcers to perform precise UGFS or other techniques of selective interruption. Especially in case of PTS and mixed ulcers this technique is very useful. Anyway, this technique is contrary to recent guidelines. Some successfully treated ulcers with surprising, unsuspected sources will be presented.
AIM  PNpP is chronic pain. It has multiple etiology and there is firm evidence of its association with VU. Physiopathology: microangiopathy and rheological alterations produces peripheral nerve ischemia similar to diabetic neuropathy. Epidemiology: PNpP is a frequent cause of disability in adults in the USA: more than 20 million of people. Primary: develop a diagnosis protocol of PNpP in VU; determine its prevalence. Secondary: determine the utility.

PAIN SCALES  General: Visual Analogue Scale (VAS). Specific: neuropathic pain DN4 questionnaire.

QUALITY OF LIFE SCORE  Euro Qol 5 Dimensions 5 Levels (EQ 5D 5L). Brief Pain Inventory 7 dimensions.


Average age.
G1: 70.6 versus G2: 58.6 years SS.
The age of the patients was lower in the G2.

DN4 mean score:
G1: 2 versus G2: 6.8 SS.
Precision of the items: tingling and burning pain are the most reliable symptoms.

EQ 5D 5L.
G2: highest percentage of affirmative answers, worse HRQOL.
G1: Level 2 32% versus G2: Level 3 37%.

BIP HRQOL.
G2: increased pain interference in all domains except personal relationships.
Greatest interference: activity, ability to walk and work.

**CONCLUSION**
We developed a diagnostic protocol of PNpP in VU.
The utility of VAS, DN4, EQ 5D 5L and BPI was demonstrated.
High prevalence of severe pain.
High prevalence of PNpP Mixed pain.
Alteration severe of HRQoL.
EQ 5D 5L: higher percentages of affirmative answer and levels of severity.
BIP: greatest interference: activity, ability to walk and work.
The effects of PNpP on HRQoL is not properly diagnosed, this does not allow to achieve a holistic practice.
Neuropathic pain related to venous ulcers is frequent and requires evaluation and appropriate treatment by an interdisciplinary group of professionals.
It is not enough for health professionals to consider only nociceptive pain in VU treatment.
However, there are no firm recommendations regarding the diagnosis and treatment of mixed PNpP pain and nociceptive pain in UV.
EFFECTS OF HESPERIDINE METHYLCHALCONE AND VITAMIN C AND THEIR COMBINATION WITH RUSCUS EXTRACT AND OF MICRONIZED DIOSMINE ON ISCHEMIA FOLLOWED BY REPERFUSION

Eliete Bouskela, Fatima Zely Garcia de Almeida Cyrino.
Laboratory for Clinical and Experimental Research on Vascular Biology (BioVasc), Biomedical Center, State University of Rio de Janeiro, Rio de Janeiro, Brazil

AIM
In the present study, we have investigated the effects of drugs commonly used to treat chronic venous diseases, namely hesperidine methylchalcone (HMC), vitamin C and their combination with Ruscus extract, micronized diosmine and their respective vehicles on macromolecular permeability increase and leukocyte-endothelium interaction induced by 30 minutes (min) ischemia followed by reperfusion.

MATERIALS AND METHODS
Investigated drugs were given by oral route (twice a day, at 8:00 AM and 5:00 PM, every day during two weeks) in 3 different doses to 171 male hamsters (Mesocricetus auratus). When Ruscus, HMC and VitC were given in combination it was according to the proportions found in Cyclo 3 Fort® (Ruscus extract 150 mg, HMC 150 mg of sterolic heterosides and ascorbic acid 100 mg). Anesthesia was induced by i.p. injection of ketamine/xylocaine and maintained with α-chloralose iv. Local ischemia of the cheek pouch was obtained by a cuff, made of thin latex tubing, mounted around the neck of the everted pouch where it leaves the mouth of the hamster. For macromolecular permeability measurements, 30 min after completion of the preparative procedure, FITC-dextran (MW 150,000 Dalton), was given iv, in a dose of 25 mg/100 g body weight. For leukocyte-endothelium interaction, prior to ischemia and 30 min after the onset of reperfusion, leukocytes were stained with an i.v. infusion of rhodamine G (5 mg/100 g/5 min). Fluorescent leukocytes adhering to the endothelium and rolling closer to the venular wall were quantified in UV-light microscope in an area of 2 by 2 mm.

RESULTS
1) Macromolecular permeability increase: vitC, HMC, the mixture (vitC + HMC + Ruscus extract) and micronized diosmine decreased it proportionally to the oral dose given to the animals, compared to their respective placebos; 2) number of adhering leukocytes: vitC significantly decreased it, proportionally to the oral dose given to the animals; at the lowest dose, HMC did not have any significant effect compared to its placebo but at all other doses tested, it showed a significant decrease; at all doses tested, the mixture of vitC + HMC + Ruscus extract significantly decreased it and in several instances it was significantly more active than micronized diosmine; micronized diosmine significantly decreased it in all doses tested but the effect was not proportional to the oral dose given to the animals; 3) number of rolling leukocytes: at the lowest and intermediary doses, vitC did not have any significant effect compared to its placebo but at the highest dose, it elicited a decrease; at the lowest dose, HMC did not have any significant effect compared to its placebo but at all other doses tested, it showed a significant decrease, in several instances more pronounced than micronized diosmine; at the lowest and intermediary doses, the mixture of vitC + HMC + Ruscus extract did not have any significant effect compared to its placebo, but at the highest dose, it decreased it and was significantly more active than micronized diosmine; micronized diosmine decreased it in all doses tested but the effect was not proportional to the oral dose given to the animals.
CONCLUSION  CVD patients have ischemia in the lower limbs due to venous stasis and it has been shown that active extracellular superoxide dismutase (EC-SOD) significantly reduced the postischemic permeability increase when present during the ischemic period. Our results strongly suggest that the combination of *Ruscus* extract, HMC and vitC has antioxidant properties.
AIM To investigate the clinical efficacy of micronized purified flavonoid fraction (MPFF) 1000 mg: given as a single 1000 mg tablet once daily in patients suffering from chronic venous disease (CVD).

MATERIALS AND METHODS In an international, randomized, double-blind, parallel-group study, patients classified C0s to C4 according to Clinical Etiological Anatomic Pathophysiologic (CEAP) classification and with leg pain graded as superior to 4 cm on a 10 cm visual analog scale (VAS), were treated for 8 weeks with either MPFF 1000 mg once daily or MPFF 500 mg twice daily. The present post-hoc analysis focuses on the effect of treatment over time in patients randomised to the MPFF 1000 mg group. Leg pain was assessed at each follow-up visit by VAS. VAS scores over time were compared between in each visit using paired Student t tests.

RESULTS 87 patients over 174 were randomised to the MPFF 1000 mg group. Mean age (± SD) was 49.1±12.2 years, most of the patients were female (81.6%), the main CEAP classes of the most affected leg were C1 (20.7%), C2 (39.1%), C3 (33.33%) and the mean duration of CVD was 14.6±10.9 years. 27.6% of the patients had been previously treated for CVD. MPFF 1000 mg tablet once daily was associated with a significant and continuous reduction in leg pain throughout the treatment period: -1.54 cm (±1.45) from baseline to week 2 (P<0.01), -1.11 cm (±1.06) from week 2 to week 4 (P<0.01), - 1.57 cm (±1.05) from week 4 to week 8 (P<0.01).

CONCLUSION The new MPFF 1000 mg dose regimen in tablet once daily was associated with a rapid and continuous reduction in leg pain throughout the 8-week treatment period.
AIM  Superficial venous thrombosis (SVT) frequently complicates the natural course of the varicose veins (VV). Optimal treatment remains controversial, the conservative management being recommended by the majority of guidelines. Although anticoagulation is effective for treatment of thrombosis it cannot resolve the problem of VV, thus patients can eventually require subsequent surgical intervention. The aim of study is the comparison of results of surgery in patients with VV complicated by SVT and VV without SVT.

MATERIALS AND METHODS  Patients operated for VV between 2008-2014 were prospectively included. Both lower limbs were examined preoperatively by duplex ultrasound. Cases with ipsi- or contralateral deep vein thrombosis (DVT) were excluded. SVT was classified according to Verrel-Steckmeier. Crossectomy, stripping and thromb/phlebectomy were performed under spinal or general anesthesia. The length of hospital stay, requirements in analgesia and rate of complications were registered. Patients were scheduled for 3-year follow-up for assessment of VV recurrence and patient satisfaction.

RESULTS  During 7 years 1115 patients (1380 limbs) were included. Surgery was performed on 1191 limbs with VV and 189 limbs with VV+SVT. Mean duration of SVT was 8.3±5.1 days. There were 69 (39.2%) cases of isolated thrombosis of varicose tributaries, 69 (39.2%) cases with SVT type I; 29 (16.4%) cases with type II and 9 (5.1%) cases with type III. Perioperative administration of low molecular weight heparins was used at 157 (83.1%) patients with VV+SVT: prophylactic doses in 110 (70.1%), intermediate in 41 (26.1%) and curative in 6 (3.8%). Median duration of anticoagulation was 4 days (IQR 2.0-5.0). Postoperative incidence of DVT was: 1 (0.5%) case in VV+SVT group and 5 (0.4%) cases in VV group (P>0.05). Surgery for VV+SVT was associated with prolonged hospital stay – 5.0 (IQR 4.0-6.0) vs. 4.0 (IQR 3.0-6.0) days (P<0.001); prolonged analgesics use – 4.0 (IQR 3.0-6.0) vs. 4.0 (IQR 2.0-5.0) days (P<0.001) and increased rate of local postoperative complications (hematoma, wound infection, lymphorrhoea, marginal skin necrosis) – 23 (12.1%) vs. 56 (4.7%) cases (P<0.001). Only 297 (21.5%) cases attended 3-years follow-up. There were not differences in rate of VV recurrence and level of patient satisfaction between VV+SVT and VV groups: 13/47 (27.6%) vs. 78/250 (31.2%) and 9.0 (IQR 7.5-10) vs. 8.5 (IQR 7.0-10) points VAS, respectively (P>0.05).

CONCLUSION  With routine use of bilateral lower limbs venous ultrasound and perioperative anticoagulation surgical treatment of VV+SVT is not associated with increased risk of venous thromboembolism and provides intermediate results comparable with elective surgery for VV. The increased rate of local postoperative complications after surgical treatment of SVT should be considered and discussed with patient.
Deep vein thrombosis biomarker research is an area of particular interest, given the increasing incidence of venous thromboembolism. The aim of the study was to evaluate whether a serum metabolic signature could be identified in patients presenting with acute deep vein thrombosis, using 1H nuclear magnetic resonance (NMR) spectroscopy.

Comprehensive untargeted metabolic profiling of serum of patients with acute DVT compared to serum of healthy volunteers was undertaken using 1H-NMR spectroscopy. Multivariate analysis such as principal component analysis (PCA) and Orthogonal Partial Least Squares Discriminant Analysis (OPLS-DA) was performed to demonstrate if there is a differential metabolic profile when comparing serum of DVT patients and controls, followed by univariate analysis to identify possible compounds responsible for any difference between the groups.

In total 102 patients were recruited in to the study including 42 patients with acute DVT (age range 24-88, mean age 55) and 62 healthy volunteers (age range 23-91, mean age 52). Within the DVT group, 74% of the DVTs were proximal and 26% distal. All DVT were confirmed on Duplex and D-dimer test. Multivariate analysis of the blood samples showed a significant separation between the DVT patients and the healthy volunteers based on their metabolic profile (OPLS-DA model R(2)=0.7 and Q(2)= 0.3). Our results suggests the existence of a differential phenotype of acute DVT and the involvement of specific compounds and pathways in DVT process.

This study demonstrates that there are clearly identifiable metabolites responsible for the difference in the metabolic signature of the specified groups that have the potential to be developed as DVT diagnostic biomarkers.
eP40 ENDOVENOUS TREATMENT OF ACUTE ILIOFEMORAL VEIN THROMBOSIS WITH ASPIRATION THROMBECTOMY CATHETER – EARLY CLINICAL OUTCOMES

Efthymios Beropoulis¹, Konstantinos Stavroulakis², Angeliki Argyriou¹, Giovanni Torsello¹, Theodosios Bisdas¹
¹ Department of Vascular Surgery, St Franziskus Hospital, Münster, Germany
² Department of Vascular Surgery and Endovascular Surgery, University Clinic of Münster, Münster, Germany

AIM  The acute deep vein thrombosis (DVT) remains a major clinical problem in the daily practice, which affects a great number of in- and out-hospital patients. The consequences vary from reduced quality of life to pulmonary embolism (PE) at the acute phase up to development of postthrombotic syndrome (PTS). Except of few indications, the vast majority of these patients are treated conservatively. Aim of our study was to evaluate the safety and efficacy of aspiration thrombectomy catheter for the treatment of acute lower limb DVT.

MATERIALS AND METHODS  Prospectively collected data of patients treated with an aspiration thrombectomy catheter (Indigo, Penumbra) for acute DVT from December 2015 to January 2018 were analyzed. In all cases, the CAT8 XTorq thrombectomy catheter was used. Adjunctive procedures and/or catheter-directed thrombolysis was left at the decision of the treating physician. Primary treatment success was defined as antegrade flow and maximal luminal stenosis of 30% assessed on the final procedural venography and evidence of a spontaneous Doppler signal in the treated vein segment.

RESULTS  Twenty patients (female 13, mean age 57 years old) with acute iliofemoral DVT were analyzed. The median time of symptoms onset and treatment was 2 days (range, 0-3). The mean lesion length amounted 190 mm. Preoperative catheter-directed thrombolysis was applied at one case and postoperative at 6. Intraoperatively, lytic agent was used in eight cases. A cava filter was used in 5 cases for the prevention of PE. In all but one patient, venous-specific stents were deployed as adjunctive procedures. The mean length of stay amounted 5 days. There was no clinical record of postprocedural PE, whereas a clinical improvement was documented at all cases. Primary treatment success and freedom from any major or minor adverse events at 30 days amounted 100%. During the follow-up period, an asymptomatic stent-occlusion was observed.

CONCLUSION  The endovenous aspiration thrombectomy for acute iliofemoral DVT showed very promising results regarding successful clot removal for the treatment of acute DVT.
AIM Thermal ablation techniques are the standard treatment for patients with varicose veins. Despite the high effectiveness of endovenous laser ablation (EVLA), recanalization of the saphenous veins is reported in up to 10% cases in mid-term follow-up. It is currently not known whether recanalization rate correlates with prior history of superficial vein thrombophlebitis (SVT).

AIM To determine the possible relationship between recanalization of saphenous veins and prior history of SVT in patients treated with EVLA.

MATERIALS AND METHODS Single-centre cohort retrospective study was conducted. We reviewed 104 cases of EVLA of the great (GSV) or small saphenous vein (SSV) performed over a two-year period, including only the patients who completed at least 3-month venous duplex ultrasound (DUS) follow-up. Eight of them suffered SVT on index leg in the past, more than 6 months before intervention. Mean age of the patients 53±14.2 years, 72 females and 32 males, 97 procedures on GSV and 7 on SSV. Mean vein diameter was 9.6±3.6 mm with mean length 37±16 sm. ELVA was performed with a 1470-nm diode laser and radial (biolitec AG) fibres by four experienced operators using a standard technique. Mean linear endovenous energy density of 84±13 j/cm in continuous mode, mean power of 5,9±0,8 watts and continuous automatic pullback with 0.7 mm/s speed were used in ablation. Chi-square test was used to determine the relationship between vein recanalization and prior history of SVT.

RESULTS The technical success rate was 100%. Mean follow-up period was 5.1±4,3 months. Obliteration or ablation was registered in 98 (94,2%) of patients at follow-up. Only 6 (5.8%) patients had recanalization and 5 (83%) of those 6 had prior history of SVT. Chi-square test showed significant relationship between prior history of SVT and recanalization rate (X2 (2, n.=104)=6.63, P<0.01). Two of the patients with recanalization were symptomatic and underwent redo procedures (1 EVLA and 1 sclerotherapy).

CONCLUSION Although EVLA is a very safe and effective method for the treatment of varicose veins, special groups of patients may have higher recanalization rates. Prior history of SVT appeared to be a significant predictor of recanalization in our cohort. Further well-designed studies are needed to confirm this relationship and to facilitate the decision-making when treating patients with prior history of SVT.
**AIM** Pulmonary thoromboembolism (PTE) is one of the most frequent causes of death at patients with concomitant injury. PTE source at most patients with concomitant injury is floating thrombosis of deep veins of lower limbs. The aim is to study the results of the use of surgical methods for preventing PTE at victims with concomitant injury.

**MATERIALS AND METHODS** In the Hospital of National Guard during the period from 2000 to 2016 the treatment was given to 417 patients with concomitant injury. Floating thrombosis in inferior vena cava system requiring the use of surgical methods of PTE prevention (implantation of removable kava-filter; thrombectomy of floating thrombus with SFV or CIV plication) have been identified at 67 (16.1%) patients. In 56.7% of patient phlebothrombosis was localized in femoropopliteal segment, in ilio-femoral segment at 40.2%, iiliokaval segment at 3%. In 75% of the cases, the top of trombus was localized in SFV and the CFC. 26.7% in iliofemoral segment, 3.3% in iliokaval segment. 25.3% of patients the floating was less than 4 cm, 59.7% from 4 to 8 cm, 14.9% was more than 8 cm.

For the diagnosis of thrombosis in the veins of the lower limbs we used ultrasound angioscanning. A study was conducted on the 2nd-3rd day, then once a week during the entire period of patients hospital stay. In cases of iliofemoral thrombosis for the assessment of embolopasnosty of proximal border of thrombus we performed CT angiography of VCI and iliac veins. PTE we performed of angio-CT of chest.

**RESULTS** At 51 (76.1%) patients in serious condition were implanted with removable kava-filter «Korona», Russia and «Opt Easy», «Cordis», USA. For 16 (23.9%) patients in stable condition open thrombectomy SFV or CIV with plikasion was performed; During the postoperative period 6 (11%) patients suffered from thromboembolism in kava-filter in one case inferior vena cava syndrome has developed. For 13 (25.5%) patients in different period of time kava-filter was removed prevention of thombosis and PE was achieved out using: heparins, early activation of the patient, elastic bandaging for limbs, electrical myostimulation.

**CONCLUSION** In severe concomitant injury deep vein thrombosis occurs in 51% of cases, floating phlebothrombosis identified in 31.4%.

The use of kava-filter in floating phlebothrombosis length 4 cm or more at victims with concomitant injury who are in serious condition is the best way to prevent surgical PE. At victims are in a stable condition, open thrombecomy with plication SFV or CIV according to our studies may be recommended as a method for surgical PTE prevention.
**AIM** Although superficial venous thrombosis (SVT) is more common than deep venous thrombosis (DVT), it drew less attention as it is considered a benign condition. The incidence of isolated SVT in population is double the incidence of DVT and pulmonary embolism (PE). Nevertheless, SVT still carries a risk of thromembolic complications including propagation to DVT, PE or recurrence. CALISTO trial concluded that prophylactic dose Fondaparinux for 45 days is effective in preventing complications. Different types of low molecular weight heparin (LMWH) have been investigated in variable doses and for different durations (minimum 30 days) and the results were contradictory. SURPRISE trial has proved Rivaroxaban for 45 days as non-inferior to Fondaparinux. The controversy regarding the management of SVT continues despite the recommendations of the British Committee for Standards in Haematology. They recommended prophylactic LMWH for 30 days or Fondaparinux for 30-45 days. Therapeutic LMWH was to be considered in patients with SVT within 3 cm of sapheno-femoral junction.

We aim to compare our protocol against the published data.

**MATERIALS AND METHODS** Consecutive patients presenting with lower limb SVT since August 2014 and confirmed with duplex ultrasonography (DUS) were included. Our practice is to give weight adjusted therapeutic dose Tinzaparin (WATT) for 2 weeks. Patients were prescribed topical non-steroidal anti-inflammatory drugs (NSAIDs) for symptomatic treatment and fitted with class II graduated compression stocking (GCS). Patients with SVT in close proximity to the junction had tinzaparin for 4 weeks. Follow-up DUS was repeated at one week and patients with confirmed stationary SVT continued treatment for the remaining period. Patients with progressing SVT were followed up with serial DUS and treatment till SVT was proven stationary. Patients with localized SVT in varicose veins (VV) below the knee were not prescribed Tinzaparin.

**RESULTS** In 4 months preliminary data analysis (n=50), 28 patients fulfilled the inclusion criteria. We excluded patients with upper limb SVT (n=2), known pre-existing cancer (n=2), SVT following VV interventions (n=2), late presentation (n=5) and combined SVT and DVT presentation (n=10). D-dimer was positive in 68% (n=19) of the included patients. 23 patients received WATT for a median duration of 14 days (min=2, max=31). 5 patients did not receive WATT. DUS at 1 week showed no change in 61% (n=17), regression in 7% (n=2) and extension in 14% (n=4) but none of them developed DVT. 11% of patients (n=3) required WATT for 30 days.

**CONCLUSION** Therapeutic dose Tinzaparin for 2 weeks is effective in preventing DVT, PE and thrombus propagation in majority of patients with lower limb SVT guided by follow-up with duplex ultrasonography.
AIM To assess oral rivaroxaban’s efficacy and safety in the treatment of upper extremity deep vein thrombosis (UEDVT).

MATERIALS AND METHODS This was a prospective observational study involving patients with their first UEDVT episodes confirmed by duplex ultrasound (DUS) without symptoms of pulmonary embolism (PE). All patients initially received low-molecular-weight heparin for 1 to 2 days and were then switched to oral rivaroxaban (15 mg bid) for three weeks and then to 20 mg qid for up to three months. Patients who had already undergone interventional UEDVT treatment were excluded. Patients were followed up with clinical examination and DUS for six months. The endpoints of the study were symptomatic PE, recurrent UEDVT, major, clinically relevant non-major and minor bleeding, recanalization of the affected veins, recognized as a blood flow with DUS, post-thrombotic syndrome (PTS) incidence of the affected limb assessed by modified Villalta score by Czihal.

RESULTS A total of 30 patients (13 men and 17 women) aged 28–78 years (mean age 52.4±17.3) were included in the study. Some (16.7%) of them had undergone physical exertion which triggered the UEDVT. In 13.3%, there was a pacemaker previously implanted through the affected limb. Also, patients had from 0 to 5 individual risk factors for venous thromboembolism (mean 1.9±1.6). The subclavian vein, predominantly on the right side (60%), was involved in the thrombotic process in all cases. The mean duration of symptoms before diagnosis was 1.8±1.7 days. All 30 patients were followed for six months. There were no episodes of symptomatic PE and/or recurrent UEDVT during the period of anticoagulation (0–3 months) and after stop of treatment (3–6 months). No episodes of major bleeding were observed. Clinically relevant non-major bleeding occurred in 2 patients (6.7%; 95% confidence interval [CI]: 1.9–21.4%) caused by uterine bleeding and large skin hemorrhage. Minor bleeding was observed in two patients (6.7%; 95% CI: 1.9–21.4%) caused by nasal and gingival bleeding. Thus, cumulative bleeding incidence was 13.4% (95% CI: 5.4–29.8%). Recanalization of upper extremity deep veins was observed in all affected limbs at three months and persist up to six months. The signs of upper limbs PTS (≥5 modified Villalta score) were found in four patients (13.4%; 95% CI: 5.4–29.8%), and the mean score was 2.1±1.9.

CONCLUSION Treatment of UEDVT with oral rivaroxaban seems to be effective, safe, and associated with the low incidence of upper limb PTS.
eP45 ASSESSMENT OF D-DIMER LEVEL AS A POTENTIAL MARKER FOR VENOUS THROMBOEMBOLISM IN PATIENTS WITH CARDIAC IMPLANTABLE ELECTRONIC DEVICES

Igor Suchkov, Roman E. Kalinin, Nina D. Mzhavanadze, Olga Zhurina, Vladislav Povarov
Ryazan State Medical University, Ryazan, Russia

AIM  Venous thromboembolism (VTE), including upper limb vein thrombosis, is one of the complications of permanent cardiac pacing. D-dimer analysis proved useful as a diagnostic test for deep venous thrombosis; however, its role in the upper limb vein thrombosis is not completely clear.

Our study aimed to assess D-dimer level as a potential marker for VTE in patients with cardiac implantable electronic devices (CIED).

MATERIALS AND METHODS  50 patients (27 men and 23 women) aged from 51 to 84 years (mean±SD age 72±8.1 years) were included in the study. All patients had indications for transvenous pacemaker implantation. In 18 (36%) cases indication for operation was atrioventricular block of various degrees, in 22 (44%) cases – atrial fibrillation with significantly impaired atrioventricular conduction, in 9 (18%) cases – sick sinus syndrome, and in 1 (2%) case - carotid sinus syndrome. Physical examination, venous blood collection for assessment of D-dimer level, and duplex ultrasound (DUS) of the upper and lower limb veins were performed in all patients at admission and 1 month after pacemaker implantation.

RESULTS  D-dimer level prior to CIED implantation was above the norm in 43 (86%) patients (mean±SD 787.6±800 µg/L DDU), vein patency was confirmed by physical examination and DUS. 25 single-chamber and 25 dual-chamber pacemakers were successfully implanted in all patients. Lead implantation was performed through cephalic vein in 41 (82%) patients, through subclavian vein – in 7 (14%) patients, and through major pectoralis muscle veins in 2 (4%) patients after failed subclavian access. 1 month after implantation mean D-dimer level was above the norm in 48 (96%) patients (mean±SD 695±554.4 µg/l DDU), VTE incidence was 10%. In 2 (4%) cases DUS identified occlusion of subclavian vein, in 1 (2%) case – occlusion of cephalic vein, in 1 (2%) case – lower extremity deep veins thrombosis extending to the level of inferior vena cava, and in 1 (2%) case – thrombosis of additional great saphenous vein. All cases of VTE were symptomatic. Difference between D-dimer levels before and after CIED placement was statistically insignificant (P>0.05). D-dimer level before operation correlated with age of the patients (r=+0.399). After CIED implantation D-dimer level was significantly higher in patients with dual-chamber pacemakers (P=0.027). There were no statistically significant associations between D-dimer levels and gender, indications for implantation, operation technique or VTE incidence (P>0.05) at 1 month.

CONCLUSION  D-dimer level was not associated with VTE incidence in CIED patients in short-term period. D-dimer level was higher in patients with dual-chamber pacemakers, which may indicate procoagulative state in this group of patients.
eP46 HEPARIN RESISTANCE IN SURGICAL PATIENTS: COULD INDIVIDUALIZED PROPHYLAXIS THROUGH RECOGNITION OF HIGH AND LOW RESPONDERS TO ANTIITHROMBOTIC TREATMENT REPRESENTS AN OPTION TO OPTIMAL ANTIITHROMBOTIC STRATEGY IN THE FUTURE?

Ktenidis Kyriakos, Mixail Gionis
Department of Vascular Surgery, Aristotle University of Thessaloniki, Thessaloniki, Greece

AIM Heparin resistance (HR) represents a considerable risk factor for perioperative and postoperative complications in surgical patients. These complications are expressed with venous and/or arterial thrombotic events which compromise the patient’s outcome after surgery. HR commonly occurs in patients with coronary disease undergoing cardio-pulmonary by-pass, cancer patients undergoing oncologic surgery, as well as in patients suffering from AT-III deficiency, or type II heparin induced thrombocytopenia. Nevertheless, HR occurred also in healthy volunteers who received prophylaxis dose of low-molecular-weight-heparin (LMWH). Our aim is to designate the HR phenomenon in order to create future antithrombotic strategies based on personalized optimal antithrombotic treatment.

MATERIALS AND METHODS / RESULTS According to our findings using the method of thrombin generation (TG) assay in patients undergoing major orthopedic surgery and vascular surgery, HR is defined as any abnormal alteration of TG specific biomarkers (lag-time, peak, time-to-peak, endogenous thrombin potential, Mean Rate Index), in surgical patients receiving thromboprophylaxis with LMWH, on the 8th postoperative day –were maximum anti-Xa effect of LMWH is expected-, compared to the same TG biomarkers on the day before surgery were no anticoagulants were somministrated. The use of TG assay permitted the recognition of high and low responders to antithrombotic treatment. HR considerably occured in major orthopedic surgery and in vascular surgery implicating patients treated with unfractioned heparin (UFH), as well as patients treated with LMWH. Additionally, a literature review of 43 studies, from 1990 to 2016, regarding the mechanism through which HR is expressed, as well as the interaction, according to the various characteristics, between LMWH, UFH and HR to clot formation in patients undergoing different types of surgery (orthopedic, vascular, oncologic, cardiovascular) reveals that HR compromises efficient anticoagulant treatment in a considerable percentage of surgical patients.

CONCLUSION Personalized antithrombotic treatment using the method of calibrated thrombin generation assay (which permits the identification of high and low responders to antithrombotic treatment), may represent a solution to optimal treatment in future antithrombotic strategy.
<table>
<thead>
<tr>
<th>A</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abreu R</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akimov AV</td>
<td>eP42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al-Ogaili A</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarcón H</td>
<td>eP5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alborov Y</td>
<td>eP42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almeida J</td>
<td>6.4, PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amery S</td>
<td>PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anastasiadou C</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andrade Gonzalez XA</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antonopoulos C</td>
<td>eP29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antonopoulos K</td>
<td>eP27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argyriou A</td>
<td>eP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asano R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bækgaard N</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baila S</td>
<td>eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balakrishnan A</td>
<td>eP43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banerjee B</td>
<td>eP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barinov V</td>
<td>1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barsamyan S</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batzalexis K</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beckett D</td>
<td>PR4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bergamo G</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bergner RT</td>
<td>eP39, PR2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beropoulis E</td>
<td>eP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bihari I</td>
<td>eP22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bisdas T</td>
<td>eP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black SA</td>
<td>1.1, 1.2, 5.4, eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blando JS</td>
<td>eP5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bogachev VY</td>
<td>eP3, eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bogdanovic D</td>
<td>3.1, 6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bogomazov A</td>
<td>eP26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Böhler K</td>
<td>3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boldin BV</td>
<td>eP3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borsuk D</td>
<td>2.1, eP10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botnar R</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bouskela E</td>
<td>eP36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branisteau D</td>
<td>eP17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown I</td>
<td>eP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budge J</td>
<td>eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burleva E</td>
<td>eP33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bzovii F</td>
<td>eP38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caggiati A</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caprini J</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capurro S</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpenter P</td>
<td>6.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casian D</td>
<td>5.1, eP38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Castro-Ferreira R</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chaer R</td>
<td>PR1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chandrashekar A</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coelho A</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crawford JM</td>
<td></td>
<td>PR3</td>
<td></td>
</tr>
<tr>
<td>Culiuć V</td>
<td></td>
<td>5.1, eP38</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Davies AH</td>
<td></td>
<td>PR2, eP39</td>
<td></td>
</tr>
<tr>
<td>De Schepper H</td>
<td></td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Despa OR</td>
<td>eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimitri S</td>
<td>eP43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominguez JU</td>
<td>eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>El-Chamali S</td>
<td>eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elias S</td>
<td>PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fashiev R</td>
<td>eP33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feodor T</td>
<td>eP17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fernandez-Hart T</td>
<td>PR4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fernando A</td>
<td>eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish J</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fligou F</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Føgh P</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fokin A</td>
<td>eP10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freitas A</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuentes Bayne HE</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fukui S</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galyfos G</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garcia de Almeida Cyrino FZ</td>
<td>eP36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasparis A</td>
<td>5.2, PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gavrilo EK</td>
<td>eP8, eP42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gavrilo S</td>
<td>eP13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geroulakos G</td>
<td>eP29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gianesini S</td>
<td>4.2, 6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giannakakis S</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giannoukas A</td>
<td>3.2, eP12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gionis M</td>
<td>eP46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gitsuk Y</td>
<td>eP15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golovko E</td>
<td>eP26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golubov EA</td>
<td>eP42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gonçalves Dias P</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goron F</td>
<td>eP30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guerra JD</td>
<td>eP23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gurtej S</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gutu E</td>
<td>5.1, eP38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gwozdz AM</td>
<td>1.1, 1.2, 5.4, eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hariri N</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hayashi H</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holdstock J</td>
<td>PR4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holmes E</td>
<td>eP39, PR2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horiuchi R</td>
<td>eP4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors' Index</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isaev A</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>J</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jacobiwitz G</td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jimenez Arribas JM</td>
<td>eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnston O</td>
<td>1.2, 5.4, eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones L</td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jorgensen S</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jovanovic M</td>
<td>3.1, 6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Just S</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>K</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kabnick L</td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kafeza M</td>
<td>eP39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kahn T</td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kakkos S</td>
<td>4.1, 4.4, 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalinin RE</td>
<td>5.6, eP18, eP21, eP45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalinin S</td>
<td>eP15, eP9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalodiki E</td>
<td>1.5, 4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaminski B</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karathanos C</td>
<td>3.2, eP12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karetova D</td>
<td>6.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kasper G</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kastrisios G</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khallaf A</td>
<td>eP43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khan T</td>
<td>eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khubulava GG</td>
<td>eP8, eP42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kirienko A</td>
<td>eP37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kittler H</td>
<td>3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klimchuk I</td>
<td>eP15, eP9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kliffod L</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kobikle T</td>
<td>eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kohenenkampf MA</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koletsis E</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Konagai N</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kontothanasis D</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korosok P</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kouri A</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koutsias S</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kreis S</td>
<td>eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kutidze I</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ktenidis K</td>
<td>eP46</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>L</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labat S</td>
<td>eP30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labenko L</td>
<td>eP44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labropoulos N</td>
<td>5.2, PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lal BK</td>
<td>PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambropoulos G</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larin I</td>
<td>eP8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lattimer C</td>
<td>1.5, 4.2, eP29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lazaris A</td>
<td>eP27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebard C</td>
<td>eP11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lee L</td>
<td>4.3, eP14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leite-Moreira A</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leon I</td>
<td>eP5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leon-Ferre RA</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less H</td>
<td>PR2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letunovsky E</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liang NL</td>
<td>PR1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liew NC</td>
<td>4.3, eP14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lobastov K</td>
<td>1.3, eP44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lohsiriwat V</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lurie F</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>M</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maggioli A</td>
<td>6.3, eP37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maharaj D</td>
<td>eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makar R</td>
<td>eP43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maltezos C</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandzhikian O</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mansilha A</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marin A</td>
<td>eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marinho A</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Markin S</td>
<td>eP15, eP9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Markopoulos G</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maroulis I</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matsagkas M</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mattin M</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mendez Hernandez A</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menegatti E</td>
<td>4.2, 6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milic D</td>
<td>3.1, 6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitea IA</td>
<td>eP17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modarai B</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mohapatra A</td>
<td>PR1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montano AJ</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montenegro AC</td>
<td>eP23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mordvin A</td>
<td>eP9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moreira Sampaio S</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morenko D</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myschetzky P</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mzhavanadze ND</td>
<td>eP18, eP21, eP45, 5.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nana P</td>
<td>eP12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Navarro PI</td>
<td>eP23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nelzén O</td>
<td>eP25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nemchand J</td>
<td>PR4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuhardt D</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nikolaev KN</td>
<td>eP42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nikolakopoulos K</td>
<td>4.1, 4.4, 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ntouvas I</td>
<td>4.1, 4.4, 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>O</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O’Brien T</td>
<td>eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obermayer A</td>
<td>eP34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberto S</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ogo T</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onida S</td>
<td>eP39, PR2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>PR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osada A</td>
<td>PR5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osborne N</td>
<td>PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Öster M</td>
<td>eP25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovchinnikov I</td>
<td>eP41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Padayachee S</td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palialexis K</td>
<td>eP29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panagopoulos K</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papacharalampous G</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papadouas S</td>
<td>4.1, 4.4, 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papageorgopoulou C</td>
<td>4.1, 4.4, 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papapetrou A</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patil AS</td>
<td>1.1, 5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phinikaridou A</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pinto J</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pouncey AL</td>
<td>1.2, 5.4, eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Povarov V</td>
<td>eP45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raco L</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radak D</td>
<td>eP37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ragg JC</td>
<td>2.2, 3.3, eP1, eP19, eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regnier C</td>
<td>eP30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reina Gutierrez L</td>
<td>6.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renders A</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rodoman G</td>
<td>eP44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rogovoi N</td>
<td>eP15, eP9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolim D</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rosco C</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rousas N</td>
<td>eP12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roussas N</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sachmpazides I</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sachsamanis G</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sadek M</td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saha P</td>
<td>1.1, 1.2, 5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sakurah H</td>
<td>PR5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmat G</td>
<td>eP30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samuel V</td>
<td>eP28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanduja V</td>
<td>eP30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sasaki Y</td>
<td>PR5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Szahin A</td>
<td>eP13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schastlivtsev I</td>
<td>1.3, eP44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shalhoub J</td>
<td>eP39, eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shanaei I</td>
<td>eP18, eP21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaydakov E</td>
<td>eP7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheikh P</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelmerdine L</td>
<td>eP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shickin NA</td>
<td>eP26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shimizu T</td>
<td>eP4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sibilla MG</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sikalas N</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silickas J</td>
<td>1.1, 1.2, 5.4, eP24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silva E</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simakov S</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smirnov O</td>
<td>eP33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith A</td>
<td>1.1, 5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sochirca M</td>
<td>5.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soto M</td>
<td>eP23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanos K</td>
<td>3.2, eP12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiliopoulos S</td>
<td>eP29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavroulakis K</td>
<td>eP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steinbacher F</td>
<td>eP34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stephenson L</td>
<td>5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stolovikov S</td>
<td>3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stoyanova K</td>
<td>2.2, 3.3, eP1, eP19, eP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strandberg C</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suchkov I</td>
<td>5.6, eP18, eP21, eP45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Šumaj M</td>
<td>eP6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tafur AJ</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tarasov V</td>
<td>eP8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tauraginskii R</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teh PA</td>
<td>4.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teixeira JF</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teoh JY</td>
<td>4.3, eP14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tessari M</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torsello G</td>
<td>eP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsalakis I</td>
<td>4.1, 4.4, 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsuij A</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsukanov YT</td>
<td>eP31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turin S</td>
<td>eP33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkin PY</td>
<td>eP3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tzaneva S</td>
<td>3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tzeng E</td>
<td>PR1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ueda J</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulloa JH</td>
<td>eP23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van Den Bussche D</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vasdeksis S</td>
<td>eP27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Velletaz R</td>
<td>eP35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Videoedo J</td>
<td>eP16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vittos O</td>
<td>eP17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vuylsteke M</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wakefield T</td>
<td>6.4, PR3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walter J</td>
<td>eP32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White A</td>
<td>PR4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whiteley M</td>
<td>PR4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yamaki T</td>
<td>PR5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yasuda S</td>
<td>PR6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Pages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yokosawa A</td>
<td>eP4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zagryadsky E</td>
<td>2.4, eP26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zamboni P</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhurina O</td>
<td>eP45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zivic S</td>
<td>3.1, 6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zuccarelli F</td>
<td>eP11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zymvragoudakis V</td>
<td>eP27, eP29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TAKE THE LEAD IN VENOUS DISEASE TREATMENT

**VenaSeal™**
Closure System

94.4% closure rate at 3 years\(^1\)

**ClosureFast™**
EndoVenous Radiofrequency Ablation System

91.9% closure rate at 5 years\(^2\)

**Abre™**
Venous Self-Expanding Stent System

IDE study launched\(^3\)

---

1. Morrison, N. VenaSeal Closure System vs. Radiofrequency Ablation for Incompetent Great Saphenous Veins (VeClose). 36-month results presented at: IVC; April 20, 2017; Miami, FL.


COTTON – For the highest functional requirements of the skin

SIGVARIS MEDICAL

www.sigvaris.com
Leading Innovative Vascular Education

May 9-11 2019
Larissa Imperial Hotel
Larissa, GREECE

10th ANNIVERSARY

Organized by:
Institute of Vascular Diseases (IVD), Greece

In collaboration with:
Hellenic Society of Vascular and Endovascular Surgery
Stony Brook University Medical Center, New York, USA

http://www.live2019.gr
Come along to one of the world’s leading centres!

VENOUS STENTING AND THROMBOLYSIS TRAINING DAYS
COME ALONG TO ONE OF THE WORLD’S LEADING CENTRES!
Guys and St. Thomas’ Hospital, London, UK
7-8 November 2018

Up to 20 places - first come first served

MEET THE EXPERTS:
Stephen Black and invited faculty:
Niels Backgaard, Prakash Saha, Karen Breen, Adam Gwozdz, Narayan Thulasidasan

IF YOU WANT TO:
► learn and improve Your Knowledge about venous stenting in chronic and acute venous obstruction, current technology and dedicated venous stents
► improve Your Skills in the endovascular venous obstruction treatment
► learn about practical implementation of IVUS in venous stenting procedures
► learn about thrombolysis for acute venous obstruction
► discuss venous stenting and thrombolysis problems and get the answers important in Your Clinical Practice
► see number of live cases and discuss Your Questions with Experts in venous stenting and thrombolysis

Course Fee £300 includes:
Access to meeting room
Dinner first evening
Refreshments and lunch

For further details please contact:
Dawn Bood
e-mail: evfhowplus@europeanvenousthromb.com
www.evfp.com
Larnassol, Cyprus welcomes

9th evf HOW 2018

HANDS-ON WORKSHOP
on VENOUS DISEASE

Grand Resort Limassol Cyprus
25-27 October, 2018

Registration Open!
Participants are limited to 100 – first come first served

The Annual EVF HOW provides the most comprehensive workshop in venous disease in Europe. It is for you who want an introduction to or need an update of the management of venous disease. Open to all specialists, physicians, including physicians in training.
For more information, visit www.evfp.com.

The EVF HOW Course benefits

- Unique program focused on hands-on learning
- Review of the “state-of-the-art” management
- Informal interaction with instructors during all sessions
- Bring your own case for discussion
- Informal and friendly atmosphere

The EVF HOW website enhances your learning experience

- Available before, during and after the workshop
- Free access included in the registration fee
- All presentations uploaded
- Contains suggested reading, important references and guidelines
- Case reports posted

For further details please contact:
Amie Tait
European Venous Forum, PO Box 172, Greenford, Middle, UB6 9ZG, UK
Tel/Fax: +44 (0) 20 8575 7944 | e-mail: admin@europeavenousforum.org

EVF HOW Plus Course at Clinic Hohmad,
Thun/Switzerland
23-24 November 2018

Up to 18 Places, first come first served!

Meet the Experts!
Claudine Hamel-Desnoes/F, Dominik Heim/CH, Hak Hong Koo/CH,
Olivier Pichot/F, Carlo Schlatter/CH, Jean-François Uhl/F, Torsten Willenberg/CH
Organisation: Dominik Heim/CH

Fees: €400
Access to clinic, refreshments, first day lunch and evening dinner
(all inclusive, except accomodation and travel)

IF YOU WANT TO:

- learn and improve Your Knowledge about sclerotherapy and phlebectomy
- improve Your Skills in duplex ultrasound scanning
- learn about practical sclerotherapy on patients
- learn about phlebectomy on patients and “scrub in” with the experts
- see a number of live cases, practice and discuss Your Questions with Experts in sclerotherapy and phlebectomy

Visit www.evfhomplus.com to access full programme and registration forms.
Contact Davide Bondi with any queries at:
evfhomplus@europeavenousforum.org
20th Annual Meeting of the European Venous Forum

Save the Date
27-29 June 2019
University of Zurich

Tripartite meeting
19th Meeting of the EUROPEAN VENOUS FORUM

9th Annual Meeting of the Balkan Venous Forum Hellenic Phlebological Society Summit

28-30 June 2018
Athens, Greece

SCIENTIFIC PROGRAMME AND BOOK OF ABSTRACTS

EDIZIONI MINERVA MEDICA

For more information, visit: europeanvenousforum.org