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CELEBRATING 20 YEARS

20th Annual Meeting of the European Venous Forum

University of Zurich

SCIENTIFIC PROGRAMME AND BOOK OF ABSTRACTS

EDIZIONI MINERVA MEDICA

Riga, Latvia welcomes

10th evf HOW 2019

HANDS-ON WORKSHOP on VENOUS DISEASE

Lielupe Hotel, Jurmala, Latvia
17-19 October, 2019

Registration Open

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.evfvip.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, P.O. Box 172, Greenford, Middx, UB6 9ZN, UK
Tel/Fax: +44 (0) 20 8575 7044 | e-mail: admin@europeanvenousforum.org

EUROPEAN VENOUS FORUM

20th Meeting of the European Venous Forum

in collaboration with the Swiss Society of Phlebology

27-29 June, 2019
Zurich, Switzerland

University of Zurich,
Main Building

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

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

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CONTENTS

WELCOME MESSAGE

Welcome address to the 20th European Venous Forum Congress

by Dominik Heim

"Welcome back, my friends, to the show that never ends" is a live album by Emerson, Lake and Palmer, the revolutionary progressive rock-band ELP, in 1974. But Keith Emerson disappeared and Greg Laker died, both in 2016 and the only remaining member of that famous and truly progressive rock group is Carl Palmer. Their 'Pictures at an Exhibition', a rock adaptation of the composition of Mussorgksy, was a milestone in rock music. A milestone in the medical sense was also the foundation of the European Venous forum 20 years ago in French Lyon. But in contrast to ELP, the European Venous Forum is still alive, and celebrating its 20th birthday in 2019 and hopefully 'Staying Alive' (Bee Gees 1977). Of course, many things have changed and many things have been achieved since -I recall the EVF HOW and the HOW Plus courses in the last years - but the original mission to develop education, scientific knowledge, research and clinical expertise of the highest quality and establish standards in the field of venous disease, remains unchallenged.

The EVF congresses are not a show in a strict sense or in the sense of ELP. But still, its touring around in Europe offers each country, where the congress resides for a few days, the possibility to combine a distinguished local faculty with the invited European (and overseas) speakers. Furthermore the industry sessions allow the presentation of the latest news in a specific field, presented by a respected, invited faculty. But, apart from these sessions, a very important accent is on the numerous oral and electronic abstract sessions, which stimulates real debates with the presenters, who have to defend their results and their conclusions. Thus EVF congresses are a very interesting mixture of different animated sessions and offers a wide variety of topics, which are this year: the various treatments of varicose veins, the rationale for ulcer treatment, compression and its new devices, lymphatic disorders and the problem of deep vein thrombosis and the post-thrombotic syndrome.

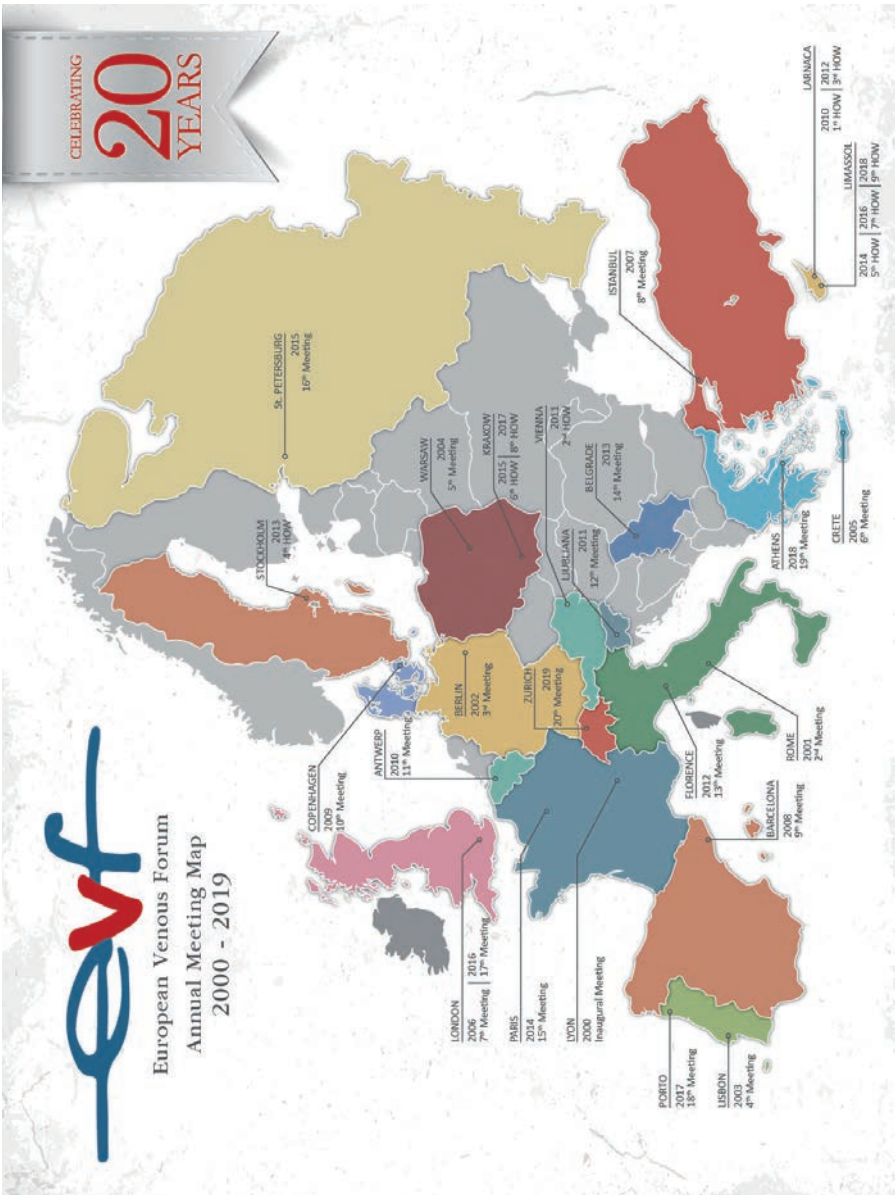
An attractive congress asks for an attractive city: Zürich is called the city of water, enjoy its waters in its different dimensions from a pleasant cosy lake to the surrounding rivers and and all its fountains. Enjoy the culture of Zürich with its theatres, movie world and musical events. Enjoy this beautiful city that combines new and old culture with the scientific and commercial world of today.

Welcome to the 20th congress of EVF, welcome to Zürich and Happy birthday: 'We're gonna have a good time, I'm glad it's your birthday, happy birthday to you' (John Lennon/ Paul McCartney the 'White album' 1968)

Dominik Heim
EVF President and Local Chairman

Andrew Nicolaides
Chairman of the EVF Board

LOCATION OF EVF MEETINGS: 2000-2019



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President, European Venous Forum

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DATE FOR YOUR DIARY!

Venous Stenting and Thrombolysis Training Days
2-3 October 2019, Guys and St Thomas' Hospital, London, UK

10th EVF HOW - Hands-on Workshop on Venous Disease
Jurmala, Latvia, 17-19 October 2019

Treatment of Lymphoedema
15-16 November 2019, Lympho-Opt Clinic, Hohenstadt, Germany

21st meeting of the European Venous Forum
Hungary, Bulgaria 24-26 June 2020
under the Presidency of Professor Imre Bihari

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	Neils 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
19th Meeting, 28-30 June 2018	Athens, Greece	Athanasios Giannoukas

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.

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CONGRESS INFORMATION

CONGRESS DATES AND TIMES

Thursday 27 June, Friday 28 June, Saturday 29 June 2019

CONGRESS VENUE

Main Building,
University of Zurich,
Rämistrasse 71,
8006 Zürich,
Switzerland
https://www.uzh.ch

REGISTRATION DESK

The Registration Desk will be open at the following times:

Wednesday 26 June 2019	16.00 - 18.00
Thursday 27 June 2019	07.00 - 18.00
Friday 28 June 2019	07.00 - 19.00
Saturday 29 June 2019	07.30 - 13.30

ON SITE REGISTRATION

On site Registration will be available.

EVF Member	€ 600
EVF Trainee	€ 350
Non EVF Member	€ 700
Congress Dinner	€ 100

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 27 June 2019: 18:20
Lecture Hall – Room KOH-B-10 and Exhibition Area
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 28 June 2019
Volkshaus, Stauffacherstrasse 60, Zurich 4
Cost: €100 per person.
To get to the venue:
Tram from Central to Stauffacherplatz: Tram no 3 (direction Albisrieden), 14 (direction Triemli) or
Tram from ETH Zurich – no 9 (direction Zurich Heuried).

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.

ACCREDITATION

An application has been made to the EACCME® for CME accreditation of this event.

The following Swiss societies have accredited the Congress with:
– SGP – 20 credits
– ETA – 3 credits
– SSIVR – 19 credits
– SGC – 16 credits
– SGDV – 20 credits
– SGA – 21 credits
– SGG – 20 credits

BADGES

Please wear your badges at all times.

MOBILE TELEPHONES

For the courtesy of the speakers and fellow delegates, pleasure 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.

SCIENTIFIC PROGRAMME INFORMATION

Short overview of the programme

The scientific programme commences on Thursday 27 June with a Video Session at 08.00, an addition this year to the scientific programme. An addition is also the short session on Friday morning 28th June, where cases of patients will be discussed. These new short morning sessions will be followed by the by now well established EVF-formula of the annual meetings.

At lunch-time on the Thursday and Friday there will be 'Meet the Expert' Sessions (introduced at the congress in Athens 2018), a chance to meet with the distinguished panellists and discuss hot topics on special managements of varicose veins and the venous ulcers. There are four didactic sessions organised jointly with the Swiss Society of Phlebology. The Prize winning papers from the American Vein and Lymphatic Society 2018 and the Japanese Society of Phlebology winners 2018 will take place on Friday 29th June at 15.45.
Twenty eight abstracts of high scientific quality will be presented. These were selected from over 140 abstracts submitted. In addition to the oral presentations, there are 30 ePoster presentations. The presentations will be available to view on screens situated in Room KOL-H-317 (3rd floor of the venue).

For the first time in the history of EVF a joint session European Venous Forum/American Venous Forum will take place, and the topics will risk a look into the near future of venous disease management. With this newly introduced session EVF/AVF the 20th annual meeting of the EVF will end on Saturday, 29th June.

We are pleased to welcome Professor Joseph Raffetto as the EVF invited Lecturer 2019. His presentation "Why venous ulcers have difficulties to heal: A pathophysiological review" will be given on Friday 28th June at 12.00.

Information for presenters and for the discussions

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).
Floor microphones are available in the Lecture Theatre. Delegates wishing to join in the discussion should stand by the nearest microphone and wait to be acknowledged by the Chairmen.
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.

Information for the 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 2020. 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 AVLS meeting in November 2019 and the Japanese Society of Phlebology who will select one and award a grant for presentation at the meeting in 2020.

SCIENTIFIC PROGRAMME

Oral Presentations

THURSDAY 27 JUNE 2019

08.00-08.30 **Video Session**
Chair: Dominik Heim (Switzerland)

08.00-08.30 **Foamsclerotherapy of the GSV**
Lecture room Philppe Kern, Switzerland

Surgery of the GSV – how to do it today
Marzia Lugli, Italy

Venous stenting – that's how we do it
Tim Sebastian, Switzerland

08.30-10.30 **Abstract Session 1: Venous Thromboembolism**
Chair: Andrew Nicolaides (Cyprus), Dominik Heim (Switzerland)
(10 minute presentation, 10 minute discussion)

08.30-08.50 1.1 **Thrombophilia is not an independent risk factor for patency loss or re-intervention in the treatment of post-thrombotic occlusion: thirty-month outcomes using nitinol venous stents**
Adam Gwozdz, Laura Tincknell, Nick Jackson, Prakash Saha, Karen Breen, Alberto Smith, Ander Cohen, Stephen Black.
St Thomas' Hospital, London, King's College London, London, UK
Submitted for the EVF Prize

08.50-09.10 1.2 **Risk of acute kidney injury associated with percutaneous mechanical thrombectomy in the treatment of iliofemoral deep venous thrombosis**
Anna Louise Pouncey[1], Jean-Luc Duval[2], Leslie Fiengo[1], Taha Khan[1], Prakash Saha[1], Narayan Thulasidasan[1], David Goldsmith[1], Stephen A Black[1].
[1]Guy's and St Thomas' NHS Foundation Trust, London, UK, [2]King's College London, London, UK
Submitted for the EVF Prize

09.10-09.30 1.3 **Five year patency outcomes following deep venous stenting**
Kemal K, Lane T, Onida S, Hifny M, Ellis M, Shalhoub J, Burfitt N, Davies AH.
Academic Section of Vascular Surgery, Imperial College London, UK & Imperial College Healthcare NHS Trust, London, UK

09.30-09.50 1.4 **Concomitant use of micronized purified flavonoid fraction and oral rivaroxaban improves clinical and ultrasound outcomes of popliteal-femoral deep vein thrombosis at 12-month follow-up**
Kirill Lobastov, Ilya Schastlivtsev, Victor E Barinov.
Pirogov Russian National Research Medical University, Moscow, Russia

09.50-10.10 1.5 **Total laparoscopic inferior vena cava filter retrieval. Mid-term outcomes**
Fedor Zharkin, Pavel Mozgovoy, Evgeniy Spiridonov, Anastasia Lukovskova, Vladimir Ufimtsev.
Volgograd State Medical University, Volgograd, Russia
Submitted for the EVF Prize

10.10-10.30 1.6 **Cost utility analysis of modalities of treatment for iliofemoral deep venous thrombosis in the United Kingdom**
Anna Louise Pouncey[1], Joseph B Babigumira[2], Oscar W Johnson[1], Stephen A Black[1].
[1]Guy's and St Thomas' NHS Foundation Trust, London, UK, [2]University of Washington, Washington, USA
Submitted for the EVF Prize

10.30-11.00 **Refreshments and visit to Exhibition**
Visit Poster Presentations (Room KOL-H-317 – 3rd floor)

11.00-12.00 **Didactic Session 1: Superficial Veins. That's why I prefer**
Chair: Lars Rasmussen (Denmark), Paolo Cassina (Switzerland)

11.00 **Foam**
Philippe Kern (Switzerland)

11.08 **Surgery**
Jürg Traber (Switzerland)

11.16 **Thermal Ablation**
Lowell Kabnick (USA)

11.24 **Non-Thermal Ablation**
Heiko Uthoff (Switzerland)

11.32-11.45 **Open Debate with Audience**

11.45-12.00 **Signs and Symptoms due to Dermatological and Systemic disorders that can mimic skin changes in Chronic Venous Disease**
Daciana Branisteanu (Romania)

12.00-13.20 **Abstract Session 2: Compression**
Chair: Armando Mansilha (Portugal), Christina Jeanneret (Switzerland)
(10 minute presentation, 10 minute discussion)

12.00-12.20 2.1 **Is compression required post radio-frequency ablation? - a randomised controlled trial**
Kazim Abbas[1], Paula Thompson[1], Damien McElvenny[2], Madu Onwudike[1].
[1]Bolton Hospitals NHS Foundation Trust, Bolton, UK, [2]University of Manchester, Manchester, UK

12.20-12.40 2.2 **Compression following endothermal ablation -- a randomised controlled trial**
Roshan Bootun, Amjad Belramman, Layla Bolton-Saghdaoui, Tristan RA Lane, Celia Riga, Alun H Davies.
Imperial College London, London, UK
Submitted for the EVF Prize

12.40-13.00 2.3 **Pressure distribution in a limb under localized compression**
Torbjörn Lundh[1], Marcus Baaz[1], Andreas Nilsson[2].
[1]Chalmers University of Technology, Gothenburg, Sweden, [2]PressCise AB, Sweden

13.00-13.20 2.4 **Internal vein compression – A Swiss invention**
Chris Ragg[1], Sebastian Kreis[2], Margaryta Zagorodnyuk[3].
[1]Angioclinic Vein Center, Zurich, Switzerland, [2]Angioclinic Venenzentrum, Zurich, Switzerland, [3]Angioclinic Vein Center, Berlin, Germany

13.20-14.20 **Lunch and visit to Exhibition**
ePoster Presentations (Room KOL-H-317 – 3rd floor)
Chair: Marzia Lugli (Italy), Rolf Engelberger (Switzerland)

13.45-14.15 **Lunch-time Session: Meet the Experts Session 1: The "Open Leg"**
Chair: Alfred Obermayer (Austria), Jürg Traber (Switzerland)

13.45 **Careful: This is not a venous ulcer!**
Jürg Hafner (Switzerland)

14.00 **How ESCHAR and EVRA can be interpreted in current clinical practice in patient selection for treatment**
Alun Davies (UK)

14.20-15.20 **Industry Session 1 (see page XXIII)**

15.20-16.40 **Abstract Session 3: Laser Thermal Ablation**
Chair: Marianne Vandendriessche (Belgium), Nicolas Ducrey (Switzerland)
(10 minute presentation, 10 minute discussion)

15.20-15.40 3.1 **Concomitant cranial tributary ablation of the saphenofemoral junction for laser crossectomy of the great saphenous vein**
Tsuyoshi Shimizu[1], Yoshio Kasuga[1], Takeshi Shimizu[2].
[1]Nagano Matsushiro General Hospital, Nagano, Japan, [2]Cosmos Nagano Clinic, Nagano, Japan

15.40-16.00 3.2 **Feasibility and safety of flush endovenous laser ablation of the great saphenous vein up to the sapheno-femoral junction**
Luca Spinedi[1], Hans Stricker[1], Daniel Staub[2], Heiko Uthoff[3].
[1]Ospedale Regionale di Locarno, Locarno, Switzerland, [2]University Hospital Basel, Basel, Switzerland, [3]Gefässpraxis am See, Lakeside Vascular Center, Luzern, Switzerland

16.00-16.20 3.3 **Endovenous laser coagulation in the treatment of patients with congenital abnormalities of the deep venous system of the lower extremities**
Larysa M. Chernukha, AA Guch, GG Vlaikov, OV Kashyrova, AO Bobrova.
State Institute "National Institute of Surgery and Transplantology named after A.A. Shalimov" NAMS, Kiev, Ukraine

16.20-16.40 3.4 **Randomised study on the influence of fibre tip distance from the femoral vein in GSV laser surgery**
Imre Bihari.
A+B Clinic, Budapest, Hungary

16.40-17.00 **Refreshments and visit to Exhibition**
Visit e-Poster Presentations

16.45-18.00 **Meeting of the Swiss Society of Phlebology (Members only)**
Room: KOL-E-18 (ground floor)

17.00-18.20 **Abstract Session 4: Diagnostic Tests, Venous Ablation by Ultrasound and Sclerotherapy**
Chair: Athanasios Giannoukas (Greece), Philippe Kern (Switzerland)
(10 minute presentation, 10 minute discussion)

17.00-17.20 4.1 **Possibilities of duplex ultrasound scanning in diagnostics of hemodynamic disorders in patients with varicose disease of the lower limbs**
Igor Suchkov, Roman Kalinin, Nina Mzhavanadze, Ivan Shanaev.
Ryazan State Medical University, Ryazan, Russia

17.20-17.40 4.2 **Is the differential diagnosis of lipoedema by means of high-resolution ultrasonography possible?**
Tobias Hirsch[1], Jörg Schleinitz[2], Markward Marshall[3], Gabriele Faerber[4].
[1]Practice for Internal Medicine and Vascular Diseases, Halle, Germany, [2]Vein Practice, Lutzen, Germany, [3]Private Practice, Rottach-Egern, Germany, [4]Centre for Vascular Medicine, Hamburg, Germany

17.40-18.00 4.3 **Non-catheter extra corporeal ultrasound-guided high-intensity-focused-ultrasound (HIFU) treatment in superficial lower limb veins - first in human study findings**
Alfred Obermayer
Karl Landsteiner Institute for Functional Phlebosurgery, Melk, Austria

18.00-18.20 4.4 **Sclerotherapy complications in the daily office practice -- lesson learned**
Aleksandra Jaworucka-Kaczorowska.
Jaworuccy Surgery Centre, Gorzów Wlkp, Poland

18.20 **Opening Ceremony**

19.00-20.00 **Welcome Reception. Exhibition Area**

FRIDAY 28 JUNE 2019

08.00-08.30 **Varicose Veins. Presentation of patients. What would you do?**
Chair: Dominik Heim (Switzerland)

08.30-10.30 **Abstract Session 5: Pathophysiology, Epidemiology and Surveys**
Niels Baekgaard (Denmark), Christina Jeanneret (Switzerland)
(10 minute presentation, 10 minute discussion)

08.30-08.50 5.1 **The relationship of reflux patterns to disease severity and health-related quality of life scores**
Matthew Tan, Sarah Onida, Nicole James, Vishnu Sajeenth, Sharon Sutanto, Mary Ellis, Alun Davies.
Imperial College London, London, UK
Submitted for the EVF Prize

08.50-09.10 5.2 **Quantitative and structural characteristics of mitochondrial DNA in varicose veins**
Mariya A. Smetanina[1], Kseniya S. Sevost'ianova[1], Arina N. Shirshova[2], Igor P. Oscorbin[2], Natalya A. Oskina[2], Igor A. Zolotukhin[3], Maxim L. Filipenko[1].
[1]Institute of Chemical Biology and Fundamental Medicine (ICBFM), Novosibirsk State University (NSU), Novosibirsk, Russia, [2]Institute of Chemical Biology and Fundamental Medicine (ICBFM), Novosibirsk, Russia, [3]Pirogov Russian National Research Medical University (RNRMU), Moscow, Russia
Submitted for the EVF Prize

09.10-09.30 5.3 **Patient characteristics and clinical practice of general practitioners and specialists in chronic venous disorders: results of vein act program**
Jorge Hernando Ulloa[1], Jorge Ulloa-Dominguez[2], Jose Manuel Jimenez Arribas[3], Sorin Baila[4], Dale Maharaj[5], Andres Marin[6], Johannes Walter[7], Vadim Yu Bogachev[8].
[1]Fundacion Santa Fe de Bogota, Bogata, Colombia, [2]Vascular Surgery Fundacion Vascular de Colombia, Bogota, Colombia, [3]Hospital San Juan de Dios, Pamplona, Spain, [4]Cardiovascular Disease Emergency Institute Bucharest, Bucharest, Romania, [5]Caribbean Vein and Vascular Clinic, St Clair Medical Hospital, Port of Spain, Trinidad and Tobago, [6]Hospital Metropolitano de Santiago, Santiago, Dominican Republic, [7]Department of Vascular Surgery, Salzburg, Austria, [8]Pirogov Russian National Research Medical University, Moscow, Russia

09.30-09.50 5.4 **Assessing venous disease risk in daily clinical practice: results from the vein score program, a prospective, single-visit, observational study**
Muralikrishna Nekkanti[1], Ankur Patel[2], Kapil Gupta[3], Ramakrishna Pinjala[4].
[1]Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore, India, [2]Gujarat Hospital Gastro and Vascular Centre, Surat, India, [3]Max Healthcare, Delhi, India, [4]Apollo Hospitals, Hyderabad, India

09.50-10.10 5.5 **Racial disparities in the outcomes of superficial vein treatments for chronic venous insufficiency**
Peter, J Pappas, Sydney, F Pappas, Khanh Nguyen, Sanjiv Lakhanpal.
Center For Vein Restoration, Greenbelt, MD, USA

10.10-10.30 5.6 **Evaluation of iliofemoral and femoropopliteal venous obstruction using digital air plethysmography**
Fedor Lurie[1], Maxim Shaydakov[2], Gregory Kasper[2].
[1]Jobst Vascular Institute and University of Michigan, Toledo, Ohio, USA, [2]Jobst Vascular Institute, Toledo, Ohio, USA

10.30-11.00 **Refreshments and visit to Exhibition**
Visit e-Poster Presentations

11.00-12.00 **Industry Session 2 (see page XXIII)**

12.00-12.30 **EVF Invited Lecture: Why venous ulcers have difficulties to heal: A pathophysiological review**
Joseph D Raffetto (USA)
Chair: Dominik Heim (Switzerland)

12.30-13.15 **Didactic Session 2: Lymphatics**
Evgeny Shaydakov (Russia), Jean-Jerome Guex (France)
(10 minute presentation, 5 minute discussion)

12.30-12.45 **Research: Here we are at the moment**
Jean Paul Belgrado (Belgium)

12.45-13.00 **Treatment by conservative means**
Daniela Reutter (CH)

13.00-13.15 **If all fails, surgery?**
Nicole Lindenblatt (CH)

13.15-14.15 **Lunch and visit to Exhibition**
ePoster Presentations (Room KOL-H-317 – 3rd floor)
Chair: Pavel Poredos (Slovenia), Heiko Uthoff (Switzerland)

13.45-14.15 **Lunch-time Session: Meet the Experts Session 2: How to deal with problems in the treatment of Varicose Veins?**
Chair: Tomasz Urbanek (Poland), Jürg Traber (Switzerland)

13.45-14.00 **SFJ incompetence and reflux into the AASV**
Marianne De Maeseneer (Belgium)

14.00-14.15 **Is redo high ligation dead?**
Olle Nelzen (Sweden)

14.15-14.45 **EVF Annual General Meeting (Members Only)**

14.45-15.45 **Industry Session 3 (see page XXIII)**

15.45-16.45 **Prize winning papers from the American Vein and Lymphatic Society (AVLS) (formerly American College of Phlebology) and the Japanese Society of Phlebology**
Chair: Bo Eklof (Sweden), Elna Masuda (USA)
(10 minute presentation, 10 minute discussion)

Presentation from American Vein and Lymphatic Society (AVLS) (formerly American College of Phlebology)

15.45-16.05 Pr1 **A population-based assessment of mortality in patients with varicose veins**
Thom Rooke, Cindy Felty, David Liedl, Kent Bailey, Christina Wood-Wintz
Mayo Clinic, Rochester, Minnesota, USA

Presentations from Japanese Society of Phlebology (JSP)

16.05-16.25 Pr2 **Results of surgical treatments for venous stasis ulcers**
Atsushi Tabuchi, Yasuhiro Yunoki, Kazuo Tanemoto
Department of Cardiovascular Surgery, Kawasaki Medical School, Kurashiki, Japan

16.25-16.45 Pr3 **Clinical characteristics, management strategies, and long-term outcomes of asymptomatic lower extremity deep vein thrombosis in patients with active cancers**
Yugo Yamashita.
Department of Cardiovascular Medicine, Graduate School of Medicine, Kyoto University, Kyoto, Japan

16.45-17.10 **Refreshments and visit to Exhibition**
Visit to e-Poster Presentations (Room KOL-H-317 – 3rd floor)

17.10-19.10 **Didactic Session 3: Venous Thromboembolism**
Chair: Marianne De Maeseneer (Belgium), Thomas Oleg Meier (Switzerland)
(14 minute presentation, 10 minute discussion)

17.10-17.34 **Is QOL score important after early thrombus removal, or is patency and Villalta score enough?**
Niels Baekgaard (Denmark)

17.34-17.58 **Postthrombotic syndrome. Long-term follow up. The Basel series**
Christina Jeanneret (Switzerland)

17.58-18.22 **The challenge of diagnosing pulmonary embolism**
Marc Righini (Switzerland)

18.22-18.46 **Everything you always wanted to know about DOAC/NOAC**
Michael Nagler (Switzerland)

18.46-19.10 **Why ATTRACT is not the end of iliofemoral thrombolysis**
Stephen Black (UK)

20.00 **Congress Dinner**

SATURDAY 29 JUNE 2019

08.30-09.45 **Didactic Session 4: Compression**
Mark Malouf (Australia), Stefan Küpfer (Switzerland)
(10 minute presentation, 5 minute discussion)

08.30-08.45 **Velcro. A real revolution in compression therapy?**
Giovanni Mosti (Italy)

08.45-09.00 **Intermittent pneumatic compression: Just nice to have?**
Eberhard Rabe (Germany)

09.00-09.15 **Towards a patient-friendly compression therapy**
Jürg Hafner (Switzerland)

09.15-09.30 **Elastic compression therapy for prevention of post-thrombotic syndrome: How long is long enough?**
Arina J ten Cate-Hoek (Netherlands)

09.30-09.45 **The relationship between venous diameters, clinical severity and quality of life. A systematic review**
Matthew Tan (UK)

09.45-10.15 **Refreshments and visit to Exhibition**
Visit Poster Presentation

10.15-11.35 **Abstract Session 6: Miscellaneous**
Imre Bihari (Hungary), Christina Jeanneret (Switzerland)
(10 minute presentation, 10 minute discussion)

10.15-10.35 6.1 **Early superficial venous reflux elimination for the treatment of chronic venous ulcers**
Aleksandra Jaworucka-Kaczorowska
Jaworuccy Surgery Centre, Gorzów Wlkp, Poland

10.35-10.55 6.2 **Intermittent pneumatic compression in the prevention of postoperative venous thromboembolism in patients at extremely high risk: The results of IPC super study**
Kirill Lobastov[1], Ekaterina Sautina[1], Eleanora Alencheva[2], Astanda Bargandzhiya[1], Victor Barinov[2], Leonid Laberko[1], Valeriy Boyarintsev[2], Grigoriy Rodoman[1].
[1]Pirogov Russian National Research Medical University, Moscow, Russia, [2]Central State Medical Academy of the President's Administration of Russian Federation, Moscow, Russia

10.55-11.15 6.3 **Endovascular management of chronic iliofemoral venous thrombosis- a systematic review and meta-analysis**
Christos Argyriou[1], Miltos Lazarides[2], George Georgiadis[3].
[1]University General Hospital, ''Democritus'' University of Thrace, Medical School, Alexandropoulos, Greece, [2]Democritus University of Thrace, Alexandropoulos, Greece, [3]University General Hospital of Alexandroupolis, Democritus University of Thrace, Alexandropoulos, Greece

11.15-11.35 6.4 **Single center experience with open and endovascular treatment of the Nutcracker syndrome**
Domenico Baccellieri, Alessandro Grandi, Germano Melissano, Roberto Chiesa.
San Raffaele. Hospital - "Vita-Salute" University, Milan, Italy

11.35 -12.35 **Joint session: European Venous Forum and American Venous Forum Where do we go from here- a glimpse into the future?**
Chair: Dominik Heim (Switzerland), Fedor Lurie (USA)
(12 minute presentation, 3 minute discussion)

Why this session?
Dominik Heim, Switzerland

11.35-11.50 **The rationale of compression**
Werner Blättler (Switzerland) (EVF/ SGP)

11.50-12.05 **The link between morphology and iliac veins and outcomes: Does shape matter?**
Lowell Kabnick (USA) (AVF)

12.05-12.20 **Recurrence after endovenous treatment. Treatment options**
Lars Rasmussen (Denmark) (EVF)

12.20-12.35 **Appropriateness of venous procedures, and its potential impact on office practices**
Elna Masuda (USA) (AVF)

12.35-12.50 **Closing Remarks**
Dominik Heim (Switzerland)

Presentation of EVF 2020
Imre Bihari (Hungary)

ELECTRONIC PRESENTATIONS

ePOSTERS

Room KOL-H-317 (3rd floor)

THURSDAY 27 JUNE 2019

Chair: Marzia Lugli (Italy), Rolf Engelberger (Switzerland)

eP1 **Risk factors and classification of re-intervention following deep venous stenting for acute iliofemoral deep venous thrombosis**

Anna Louise Pouncey, Taha Khan, Prakash Saha, Narayan Thulasidasan, Stephen A Black.
Guy's and St Thomas' NHS Foundation Trust, London, UK

eP2 **A novel method of assessment of microcirculatory changes with the use of Geko™ device in patients with venous leg ulcers**

Saroj Das[1], Luxmi Dhoonmoon[2], Duncan Bain[3], Swati Chhabra[4].
[1]London North West University Health Care NHS Trust, UK, [2]Central And North West Health Care NHS Trust, UK, [3]Geko First Kind, UK, [4]London North West University Health care NHS Trust, London, UK

eP3 **MPFF reduces the risk of adverse reactions following endovascular treatment of varicose veins**

Vadim Yu Bogachev, Boris V Boldin, Pavel Yu Turkin.
Pirogov Russian National Research Medical University, Moscow, Russia

eP4 **Randomized comparative trial comparing three energy settings in endovenous laser ablation for chronic venous disease**

Denis Borsuk[1], Alexey Fokin[2], Evgeny Ilyukhin[3], Roman Tauraginskii[4].
[1]Clinic of phlebology and laser surgery Vasculab ltd., Chelyabinsk, Russia, [2]Department of Surgery, South Ural State Medical University, Chelyabinsk, Russia, [3]Clinic Medalp, St Petersburg, Russia, [4]Clinic of Phlebology and Laser Surgery Vasculab ltd., Chelyabinsk, Russia

eP5 **Radiation and contrast free catheter-directed thrombolysis for early pregnancy related massive iliocaval deep vein thrombosis**

Ulrike Huegel[1], Nils Kucher[2].
[1]Inselspital, Bern, Switzerland, [2]University Hospital Zurich, Zurich, Switzerland

eP6 **Experimental single-step electric welded connection of vessels**

Dmytro Dubenko, Olexandr Humenchuk, Mykola Melnyk, Kostynatyn Karpenko, Mariya Levon, Victor Chernyak.
Bogomolets National Medical University, Kiev, Ukraine

eP7 **Long-term results of open phlebectomy without ligation of perforator veins**

Igor Suchkov, Roman Kalinin, Nina Mzhavanadze, Ivan Shanaev.
Ryazan State Medical University, Ryazan, Russia

eP8 **Lower limb oedema in moderate superficial venous disorders is not only an ankle oedema**

Didier Rastel[1], Amalric Montalibet[2], Cyril Chaigneau[3], Etienne Grenier[3].
[1]Selurl Philangio, Grenoble, France, [2]Institut National Des Sciences Appliquees, Lyon, France, [3]Sigvaris, Saint-Just-Saint-Rambert, France

eP9 **Pathogenetic effects of MPFF in the treatment of varicose veins**

Igor A Suchkov, Roman E Kalinin, Nina D Mzhavanadze, Aleksey A Kamaev.
Ryazan State Medical University, Ryazan, Russia

eP10 **Using D-dimer to rule-out proximal DVT patients**
Soroosh Shekarchian[1], Pascale Notten[1], Cees Wittens[2].
[1]Cardiovascular Research Institute Maastricht, Maastricht, Netherlands, [2]Maastricht University Medical Centre, Maastricht, Netherlands

eP11 **Predicting haemodynamic success prior to saphenous ablation with concurrent APG and PPG on a tilt-table**
Erika Mendoza[1], Christopher R. Lattimer[2].
[1]Venenpraxis, Wunstorf, Germany, [2]Ealing Hospital and Imperial College & West London Vascular and Interventional Centre, London, UK

eP12 **Inferior vena cava filters in vte patients: utilization in tertiary clinical center**
Oksana Efremova, Magomed Arslanbekov, Igor Lebedev, Igor Zolotukhin, Aleksandr Kirienko.
Pirogov Russian National Research Medical University, Moscow, Russia

eP13 **Endovenous thermal ablation of great saphenous vein performed using tumescent local anesthesia with minimal anesthetic dose**
Nasraddin Abushov[1], Elmar Zakirjayev[1], Mahammad Kerimov[2], Zaur Aliyev[1], Gulnur Abushova[1].
[1]Scientific Centre of Surgery named after M.A. Topchubashov, Baku, Azerbadijan,
[2]Azerbaijan Medical University, Baku, Azerbadijan

eP14 **First experience of using "swift" radial fibres for endovenous laser ablation - a premarketing study**
Hovsep Manjikian, Irakly Kutidze, Anton Isaev.
Eramishantsev Hospital, Moscow, Russia

eP15 **Sulodexide as adjuvant to anticoagulant treatment on patients with lower extremity deep vein thrombosis**
Erasto Aldrett Lee[1], Alberto Frati Munari[2].
[1]Grupo de Atención Vascular Integral, San Luis Potosí, Mexico, [2]Alfa Sigma Mexico, Mexico

eP16 **High resolution ultrasound reveals six stages of stasis-induced vein valve damage**
Chris Ragg, Samira El-Chamail.
Angioclinic Vein Center, Zurich, Switzerland

FRIDAY 28 JUNE 2019

Chair: Pavel Poredos (Slovenia), Heiko Uthoff (Switzerland)

eP17 **Surprise: high incidence of vein insufficiency in children**
Chris Ragg[1], Tobias Kobilke[2], Krastina Stoyanova[2].
[1]Angioclinic Vein Center, Zurich, Switzerland, [2]Angioclinic Vein Center, Berlin, Germany

eP18 **Evolution of quality of life in outpatients with chronic venous disease seen by general practitioners: results from the ALIADO program in colombia**
Jorge Hernando Ulloa[1], Jorge Ulloa Dominguez[2], Gabriel Bayona[1], Luis Gerardo Cadavid[3], Rafael Garrido[4].
[1]Fundacion Santa Fe de Bogota, Bogata, Colombia, [2]Fundacion Vascular, Bogata, Colombia, [3]Clinica El Rosario, Bogata, Colombia, [4]Clinica Portoazul, Medellin, Colombia

eP19 **Chiva-laser: office-based ambulatory hemodynamic procedure for conservative treatment of varicose veins**
Attila Puskas, István György-Fazakas, Timea Varga-Fekete, Zsolt Balogh.
Angio Center, Targu Mures, Romania

eP20 **Catheter-directed foam sclerotherapy vs endovenous laser ablation: one-year follow-up prospective study**
Vasily Izmestyev[1], Oleg Smirnov[1], Elena Burleva[2], Sergei Tyurin[1].
[1]MC OLMED, Yekaterinburg, Russia, [2]Ural State Medical University, Yekaterinburg, Russia

eP21 **Implementation of new endovenous treatments of varicosis in the therapy of venous malformations**
Ulrike Huegel[1], Iris Baumgartner[2].
[1]Inselspital, Bern, Switzerland, [2]Inselspital Bern, Switzerland

eP22 **New venous hemodinamical ad anatomical patterns for great saphenous vein sparing surgery**
Edoardo Cervi[1], Paolo Casoni[1], Emanuele Nanni[2], Matteo Pizzamiglio[3], Marika Delai[4].
[1]Hospital Piccole Figlie, Parma, Italy, [2]Ippocrate Vein Clinic, Parma, Italy, [3]University of Madrid, Madrid, Spain, [4]University of Brescia, Brescia, Italy

eP23 **Deep venous valvular function in lower extremity venous drainage**
Igor Suchkov, Roman Kalinin, Nina Mzhavanadze, Ivan Shanaev.
Ryazan State Medical University, Ryazan, Russia

eP24 **The efficacy and safety of micronized purified flavonoid fraction in the treatment of venous diseases in gerontological patients**
Yury Stoyko, Maxim N Yashkin, Vladimir P Tyurin, Victor G Gudymovich.
National Medical and Surgical Center named after N.I. Pirogov, Moscow, Russia

eP25 **Evolution of symptoms with endovenous ablation of varicose veins in outpatients with chronic venous disease: results of the ALIVIO program in Colombia**
Jorge Hernando Ulloa[1], John Fernando Garcia[2], Ruben Dario Villarreal[3], Miguel Ramirez[4].
[1]Fundacion Santa Fe de Bogota, Bogota, Colombia, [2]Viavascular, Medellin, Colombia, [3]Clinica del Caribe, Barranquilla, Colombia, [4]Country Vascular Center, Bogata, Colombia

eP26 **Intraluminal venous stenting for non-thromboticiliac vein lesion (NIVL)-a single institution experience**
WenHsien Hsu.
Taipei Medical University-WanFang Hospital, Taipei, Taiwan

eP27 **Radiofrequency versus 1470nm laser ablation of great saphenous vein reflux: a single center, randomized clinical study**
Christos Karathanos, Petroula Nana, Konstantinos Spanos, Konstantinos Batzalexis, Nikolaos Roussas, Athanasios Giannoukas.
Department of Vascular Surgery, University Hospital of Larissa, Faculty of Medicine, University of Th, Larissa, Greece

eP28 **Influence of CDT on quality of life of patients with lower limb lymphedema**
Tatiana Apkhanova, Detelina Kulchitskaya.
National Medical Research Center for Rehabilitation and Balneology, Ministry of Health of Russia, Moscow, Russia

eP29 **Risk factors for recurrent deep venous thrombosis**
Raghid Kreidy[1], S Benalli[2].
[1]Saint George Hospital , University Medical Center, Beirut, Lebanon. [2]Sidi Bel Abbas, University Medical Centre, Sidi Bel Abbas, Algeria

eP30 **Endovenous laser, sclerotherapy and vein gluing combined as a single catheter procedure for saphenous veins. Initial experience**
Valeriia Volkovaia, Sebastian Kreis, Chris Ragg.
Angioclinic Vein Center, Zurich, Switzerland

INDUSTRY SUPPORTED SESSIONS

THURSDAY, JUNE 27, 2019

14.20-15.20 Industry Session: supported by a grant Servier
State of the art: benefits of MPFF throughout CVD progression
Chair: Andrew Nicolaides (Cyprus)

Introduction
Andrew Nicolaides (Cyprus)

Early stages of CVD: medical treatment alone or in addition to endovenous treatments
Armando Mansilha (Portugal)

More advanced stages of CVD: evolution of surgical techniques and advantages of associated medical treatment
Fedor Lurie (USA)

Most severe stage: update on the management of patients with venous leg ulcers
Andrew Nicolaides (Cyprus)

Panel Discussion

Closing remarks
Andrew Nicolaides (Cyprus)

FRIDAY, JUNE 28, 2019

11.00-12.00 Industry Session: supported by a grant from Pierre Fabre
CEAP clinical classes C0S-C4: Differences, similarities and place of Cyclo 3 Fort in treating patients with CVD
Chair: Andrew Nicolaides (Cyprus)

Heritability, genetics and effect of environmental factors
Jean-Jerome Guex (France)

Pathophysiology and effects on microcirculation
Marzia Lugli (Italy)

Cyclo3 Fort: Mechanisms of action and clinical benefits
Stavros Kakkos (Greece)

14.45-15.45 Industry Session: supported by a grant from Alfasigma
Unravelling the puzzle of CVD
Chairs: Andrew Nicolaides, Armando Mansilha

Patients' heterogeneity and multifactorial etiology in CVD
Andrew Nicolaides (Cyprus)

Drivers of CVD progression
Ferdinando Mannello (Italy)

How to manage the clinical mosaic of CVD
Thomasz Urbanek (Poland)

Challenge questions session
Armando Mansilha (Portugal)

THE EUROPEAN VENOUS FORUM – ON VISIT IN ZÜRICH/ SWITZERLAND

PD Dr. med. Dominik Heim, Venenzentrum Thun

Zürich hosts – in collaboration with the Swiss Society for Phlebology/ SGP – the 20th annual meeting of the European Venous Forum/ EVF from June 27th to 29th 2019 at the more than 100 years old, most prestigious university building of Zürich. It will be another exciting get-together of more than 500 phlebologists, angiologists, surgeons, dermatologists and interventional radiologists from Europe with further guests from USA and Japan to discuss the latest aspects of phlebology.

The list of towns, that EVF paid tribute to it is long, in fact it is twenty names long. It all started in French Lyon in 2000 with Michel Perrin as first congress president and Andrew Nicolaides as chairman. Michel Perrin narrates : «In Sydney airport lounge Pr. Andrew Nicolaides who was in transit for going to Japan approached me and said – Michel, do you think it is time to create European Venous Forum? – I answered, let me 5 minutes to think about this proposal and I will come back. Five or perhaps 10 minutes later, my answer was positive. That was a genuine democratic process but does a scientific society need it?", he smiled.

After the last annual meetings in Paris (2014), St. Petersburg (2015), London (2016), Porto (2017) and Athens (2018) it is now the turn for Zürich, in the centre of Europe. But, what is EVF? A bunch of old men, commented someone lately. Really?

EVF was founded along the example of the American Venous forum/ AVF, says Bo Eklöf, former president of AVF at our personal meeting in Helsingborg last March, and Michel Perrin confirms this by stating: "AVF was the stimulus for the creation of EVF and adds – laughing now in his look back at the Lyon congress – in "genesis and birth of the European Venous Forum": "I did not care about an article published in a French vascular journal some months later, Michel Perrin is a traitor, he organized an English-speaking convention in Lyon, Gaul capital".

From the very beginning EVF gave itself strict rules: "Congress language is English. EVF provides a platform for discussion of all new advances and aspects of phlebology with emphasis on education and discussion". Out of all submitted abstracts the best 30 are selected and presented at the annual meeting: the speaking time is strictly 10 minutes, followed by the same 10 minutes for the paper's discussion. That might be pure stress for the presenters, but "that's where the truth comes out" says Bo Eklöf. For, that's its mission: "education, scientific knowledge, research and clinical expertise of the highest quality and establish standards in the field of venous disease". Its annual meeting, like now the oncoming congress in Zürich, is one of the format EVF is striving for. But there are other EVF events: In 2010 Bo Eklöf and Peter Neglén started the EVF HOW courses with its special structure: not more than 100 participants from all over Europe and a faculty of well known specialists (the rate of participants-faculty should be 3 to 1), 24 working stations with a representant from the industry and a faculty member. And there is the possibility to review all the activities during one year on an interactive website.

Based on the success of these annual HOW courses, smaller courses and workshops have been developed and are taking place in different European cities since 2015: the so called EVF HOW Plus courses. There, a very limited number of people is taught by specialists in their field in a special topic (*e.g.* stenting, sclerotherapy and others). What makes these courses/workshops so special? Bo Eklöf says: "The very open atmosphere, where nobody is afraid of asking silly questions (that do not exist anyway). They are unique, because they are very well structured".

And there is something else about EVF: its guidelines. Since 2009 several, internationally approved guidelines on different venous topics exist and have been published. They have been elaborated in collaboration with other phlebologiocal organisations and societies, in accordance to the mission of EVF "establish standards in the field of venous disease".

In conclusion: EVF- A bunch of old men"? No, rather "The Wild Bunch" (Western movie by Sam Peckinpah, 1969)! The EVF celebrates its 20th annual reunion in Zurich. Happy Birthday, EVF"!

THE UNIVERSITY OF ZÜRICH

Switzerland counts around 8 million inhabitants to date. There are 10 universities and two similar technical institutions. The oldest university is in Basel, founded in 1460, the biggest is the University of Zürich, founded 1833 with more than 25,000 students today. It has several buildings in town, that have been added during its history. The main building at the Rämistrasse (where the EVF congress takes place) was built between 1911-1914 by the architects Karl Moser and Robert Curjel. With its quadratic tower it is an impressive landmark of Zürich situated on a small hill within the town centre. Very special is the so-called „Lichthof" (light hall), a five floor high hall covered by a roof out of glass in the middle of the building with all the rooms situated around it on five floors. There, one finds the famous Nike from Samothrake and the parthenon frieze (Elgin marbles from the British museum in London) as plaster cast castings. From 2001-2002 a new mensa and a new auditorium were built, the colours of auditorium quite unique in rose, blue and bright green.
The history of the University is reflected by many important personalities, having educated, awarded and visited there: the first female medical doctor promoted was a Russian student; Nadeska Suslowa, a close friend of her and being the first female doctor of Switzerland was Marie Heim-Vögtlin (1845-1916). Several Nobel prizes have gone to Zürich among others in medicine to Rolf M. Zinkernagel 1996 and in 1949 to Walter Rudolf Hess. Winston Churchill visited the university and held his famous speech in the aula on the 19th September 1946, ending with his famous words "Therefore I say to you: let Europe arise!"

Figure 1. Churchill's famous speech in the aula of the University of Zürich with many notables from science and politics present in 1946.

BOOK OF ABSTRACTS

1.1 THROMBOPHILIA IS NOT AN INDEPENDENT RISK FACTOR FOR PATENCY LOSS OR RE-INTERVENTION IN THE TREATMENT OF POST-THROMBOTIC OCCLUSION: THIRTY-MONTH OUTCOMES USING NITINOL VENOUS STENTS

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AIM Thrombophilias increase the risk of venous thromboembolism (VTE). The antiphospholipid syndrome (APS), an acquired thrombophilia, carries a high risk of recurrent VTE. Post-operatively, APS patients require long-term vitamin K antagonists (VKA) compared with direct oral anticoagulants (DOACs) for patients with inherited thrombophilia. The aim of this study was to examine the association of thrombophilia with cumulative patency and re-intervention rates following stenting for post-thrombotic occlusion.

MATERIALS AND METHODS Consecutive patients (2012-2017) receiving a nitinol venous stent for post-thrombotic disease with a minimum of 18mth follow-up were included for analysis. Thrombophilia testing was performed when VTE occurred at a young age with: weak provoking factors; strong family history; or recurrence, as per clinical guidelines. Post-operative anticoagulation comprised low molecular weight heparin for 2wks, followed by a VKA for 6mths. Patients with APS continued long-term VKA therapy, while all other patients transitioned to DOACs. Stent patency was assessed using duplex ultrasonography 24 hours, 2 weeks, 6 weeks, 3 months, 6 months, 1yr and yearly post intervention. Re-interventions were performed when there was a reduction in stent diameter of >50% or occlusion.

RESULTS One-hundred and five (105/146; 72%) patients met the criteria for thrombophilia testing. Fifty (50/105; 48%) patients had either an inherited (25/50; 50%) or acquired (25/50; 50%) thrombophilia. The remaining (55/105; 52%) tested patients had no thrombophilia detected, and (41/146; 28%) did not meet the criteria for thrombophilia testing. Of one-hundred and seventy-three limbs stented, eighty required re-intervention (80/173; 46%) during follow-up to maintain stent patency. Twenty-nine (29/56; 52%) re-interventions occurred in limbs of patients with thrombophilia, and thirty-six (36/68; 53%) without (P=0.646). Of those not tested for thrombophilia, fifteen (15/49; 31%) limbs required re-intervention, significantly less compared with patients tested for thrombophilia (P=0.027). Most re-interventions occurred early (median time to re-intervention 6 weeks; median clinical follow-up 27 months (range 18-39 months)). Cumulative patency was 85% for patients tested for thrombophilia (91% for patients with thrombophilia and 81% in patients without; P=0.130), and 92% in those not tested (P=0.331).

CONCLUSION The increased re-intervention rate observed in patients that meet clinical guidelines for thrombophilia testing likely reflects the increased risk of venous thrombosis in this group of patients. Despite this, patients with inherited or acquired thrombophilia should not be excluded from ilio-femoral venous stenting as patency outcomes are good in conjunction with appropriate post-operative anticoagulation therapy. Thrombophilia assessment for APS should be performed in patients undergoing ilio-femoral venous stenting without strong provoking factors for VTE as prolonged anticoagulation with VKA is advised for APS patients due to increased risk of VTE recurrence.

Submitted for the EVF Prize.

1.2 RISK OF ACUTE KIDNEY INJURY ASSOCIATED WITH PERCUTANEOUS MECHANICAL THROMBECTOMY IN THE TREATMENT OF ILIOFEMORAL DEEP VENOUS THROMBOSIS

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AIM Early clot removal for treatment of iliofemoral DVT has been shown to reduce the risk of post-thrombotic syndrome. Rheolytic percutaneous mechanical thrombectomy (PMT) utilises saline jets to macerate the thrombus and can reduce lytic dose and exposure compared to catheter directed thrombolysis (CDT) alone. However, haemolysis and haemoglobinuria caused by mechanical thrombus maceration has been associated with an increased risk of acute kidney injury (AKI). This study sought to evaluate the risk of renal injury amongst patients receiving PMT relative to those who received catheter directed thrombolysis (CDT) alone.

MATERIALS AND METHODS A retrospective cohort study was performed, which examined all patients who presented to a vascular tertiary centre between 2011 and 2017 and received catheter-directed thrombolysis, with or without percutaneous mechanical thrombectomy, for treatment of symptomatic acute ilio-femoral DVT. Patient demographics, thrombosis risk factors, modality of treatment and incidence of complications were collected. The renal function of these patients was assessed through their pre-procedural eGFR and creatinine, peak creatinine within 72 hours of the interventions and highest baseline eGFR in the subsequent 6 months. KDIGO (Kidney Disease Improving Global Outcomes) criteria were used to determine the presence and severity of acute renal dysfunction, and CKD (chronic kidney disease) classification was used to categorize the extent of long-term renal impairment.

RESULTS A total of 139 patients, 63 (45%) treated with PMT *vs.* 76 (55%) treated with CDT alone, were identified. Baseline demographic data and prevalence of risk factors were comparable. On admission, 60% PMT *vs.* 48% of CDT cases (P=0.20) were identified to have an eGFR of less than 90. The mean rise in creatinine in the 72hrs after the procedure was not significantly different: PMT 1.24 times (95%CI:1.11-1.37), *vs.* CDT 1.08 times (95%CI:0.88-1.29) pre-procedural values (P=0.48). However, there was an observed difference in the number of patients who developed stage 1 AKI or above, 14% (N.=8) of patients receiving PMT compared to 3% (N.=2) receiving CDT (P=0.04). Observed difference in development of AKI stage 2 or more was not significant (P=0.14). The majority of patients (82% of PMT cases *vs.* 86% of CDT) were observed to return to baseline eGFR within 6 months, with 69% *vs.* 70% recovering within 14 days. Post-procedurally 57% PMT *vs.* 43% CDT cases were classified as CKD stage 2 or above (P=0.18).

CONCLUSION Patients presenting with iliofemoral DVT are at risk of renal impairment regardless of treatment modality. Use PMT was associated with a greater transient rise in serum creatinine and AKI, but there was no difference observed in return to baseline renal function. These findings warrant further mechanistic evaluation.

Submitted for the EVF Prize.

1.3 FIVE YEAR PATENCY OUTCOMES FOLLOWING DEEP VENOUS STENTING

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AIM Deep venous stenting has become more popular over the past few years with the advent of dedicated venous stents. Stenting is now commonly used in the treatment of May Thurner syndrome or in patients with post thrombotic syndrome to alleviate venous obstruction.[1] Re-intervention rates for stent thrombosis or stenosis can be high and are a big concern with regards to this treatment.[2] The aim of this study was to assess stent patency and re-intervention rates in patients who had undergone lower limb deep venous stenting in a tertiary vascular unit. In addition, a comparative analysis of stent patency for acute and chronic occlusions was performed.

MATERIALS AND METHODS This was a retrospective single centre study of prospectively collected data. All patients who underwent stenting (with dedicated venous stents) for acute and chronic deep venous disease between November 2011 and June 2018 were included in the study. During the post-stent surveillance programme, duplex ultrasound was used to assess stent patency.

RESULTS Seventy-eight deep venous stents were inserted between November 2011 and June 2018. Ten patients were immediately lost to follow up and were therefore excluded from the analysis. The median age was 41.5 years (range 13-79 years) and twenty-eight procedures were for acute presentations and forty for chronic occlusions. Twenty-two limbs required re-intervention (32%) (thrombolysis, venoplasty and/or additional stent insertion). There was no statistical difference in primary, primary assisted or secondary patency between stents inserted in the acute or chronic setting. Patency rates are as demonstrated in the table below:

Time (month)	3	6	12	18	24	35	48	60
Primary Patency	92%	89%	84%	82%	75%	60%	30%	30%
Primary Assisted	92%	91%	91%	91%	88%	82%	82%	82%
Secondary Patency	91%	90%	90%	90%	87%	82%	82%	82%

CONCLUSION These results demonstrate good overall secondary patency outcomes in patients who have undergone deep venous stent procedures. Thirty-two per cent of patients required re-intervention; this underlines the importance of stent surveillance for timely identification of these individuals. There was no significant difference in patency outcomes comparing stents sited for acute versus chronic disease.

1.4 CONCOMITANT USE OF MICRONIZED PURIFIED FLAVONOID FRACTION AND ORAL RIVAROXABAN IMPROVES CLINICAL AND ULTRASOUND OUTCOMES OF POPLITEAL-FEMORAL DEEP VEIN THROMBOSIS AT 12-MONTH FOLLOW-UP

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

MATERIALS AND METHODS In this pilot, randomized, open-label, blinded endpoint study, patients with a first episode of popliteal-femoral DVT confirmed by duplex ultrasound (DUS) were allocated to two groups: patients in the control group received standard treatment with oral rivaroxaban for 6 months, and patients in the MPFF group received additionally MPFF 1000 mg/day for 12 months. During the 12-month follow-up period, the degree of recanalization was assessed every two months by the popliteal (PV), femoral (FV), and common femoral (CFV) vein compressibility using DUS. Thrombi extension was assessed by the modified Marder score. At 12 months, patients were assessed using the Villalta scale and Venous Clinical Severity Score (VCSS). Post-thrombotic syndrome (PTS) was diagnosed in patients with Villalta score ≥5. Between-group comparisons of mean values with time were performed using the general linear model for repeated measurements; comparisons of categorical variables were performed using a chi-square test.

RESULTS 30 patients in each group (N.=60 patients, 40 males and 20 females, mean (±SD) age: 56.3±13.4 years) were included. At baseline, DVT was unprovoked in 65% and had left side localization in 45% of patients. The mean (±SD) baseline Marder scores were 15.0±4.8 and 11.1±4.3 in the MPFF and control groups, respectively and decreased to 0.4±1.2 and 2.1±2.6, respectively at 12 months. A significantly greater reduction in the Marder score (P<0.0001) and a faster recanalization of the PV (P=0.035) and FV (P<0.0001) were observed in the MPFF group. At 12 months, the complete recanalization of the PV was achieved in 27 patients (90%) of the MPFF group, and in 18 patients (60%) of the control group (P=0.015).
The median Villalta and VCSS scores at 12 months were significantly lower in the MPFF group, compared to the control group (1.9±2.0 *vs.* 5.2±2.6 [P<0.0001] and 1.5±1.3 *vs.* 4.9±2.0 [P<0.001], respectively). Using the Villalta score, PTS was diagnosed in 4 (13.3%) and 16 patients (53.3%) of the MPFF and control groups, respectively (P=0.002). During the follow-up, a recurrent DVT was observed in 16.7% of patients in the control group, predominantly after cessation of anticoagulation treatment, *versus* no patients in the MPFF group (P=0.052).

CONCLUSION In patients with popliteal-femoral DVT treated with rivaroxaban, long-term treatment with MPFF is associated with a faster recanalization of the deep veins and a lower incidence of PTS at 12 months, and with a trend for a reduction in the DVT recurrences after cessation of anticoagulation therapy.

1.5 TOTAL LAPAROSCOPIC INFERIOR VENA CAVA FILTER RETRIEVAL. MID-TERM OUTCOMES

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AIM Deep venous thrombosis of the lower extremities is the most common cause of pulmonary embolism. One of the most popular surgical method to prevent pulmonary embolism is the implantation of a cava filter. The number of complications associated with implantation of a cava filter such as perforation of the vein wall, aorta, abdominal organs, disposition or destruction of the construction, IVC thrombosis may be decreased by using removable types. According to the results of the meta-analysis, the frequency of successful attempts to remove cava filters varies from 8.5% to 89.7% and has significantly increased conforming to reports of recent years, which is associated with the introduction of new methods into everyday practice. Materials: In our report, we present a description of four clinical cases. It is our first experience of successful totally laparoscopic IVC filter removal. There were 4 patients, males, average age 55 years. In all cases were installed retrievable Cava filters, preliminary attempts at endovascular removal of the constructions using the "Side loop" (Cook, USA), EN Snare (Merit Medical, USA) were unsuccessful. It was decided to perform laparoscopic removal of cava filter as an alternative to open surgery, because of abdominal pain syndrome, high risk of IVC trombosis and a number of other factors. Patients were informed about possible complications and risks, gave consent for the operation. Under general anesthesia, was created pneumoperitoneum. The inferior vena cava was mobilized through the right retroperitoneoscoic approach. Afterwards pererenal zone of IVC the renal veins and were clamped. Performed phlebotomy. Cava filter was removed from the cavity of the inferior vena cava. The phlebotomy defect was covered totally laparoscopic by atraumatic suture. Results: Average operating time was 163,75 min, Average IVC clamping time 30.5 min, Average blood loss 305 mL. Frequency of conversions 0%, morbidity 0%. The postoperative period is uncomplicated in all cases. We examined our patients in a 3, 6, 12 months after operation. Patients were controlled by ultrasound investigation, CT cavagraphy. In all cases IVC free of thrombus, without stenosis in reconstruction zone.

CONCLUSION Totally laparoscopic removal of IVC filter can be considered as an effective mini-invasive method in inefficiency cases of endovascular methods, as an alternative to open surgery in certain groups of patients.

Submitted for the EVF Prize.

1.6 COST UTILITY ANALYSIS OF MODALITIES OF TREATMENT FOR ILIOFEMORAL DEEP VENOUS THROMBOSIS IN THE UNITED KINGDOM

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AIM Early clot removal using percutaneous interventional techniques aims to reduce the incidence of post-thrombotic syndrome (PTS) following iliofemoral deep venous thrombosis (DVT), compared to oral anticoagulation alone. This carries the potential to reduce long-term morbidity, but carries a higher initial healthcare cost. We compared the cost effectiveness of catheter directed thrombolysis (CDT), and pharmacomechanical thrombectomy (PMT) as compared to oral anticoagulation (OAC) alone, for treatment of acute iliofemoral DVT, in the United Kingdom.

MATERIALS AND METHODS We developed a 10-state Markov model with the following states: acute DVT, pulmonary embolism, intracranial bleed, extra-cranial major bleed, extra-cranial minor bleed, post DVT with no thrombotic syndrome, mild PTS, moderate PTS, severe PTS and dead. All patients commenced in the acute DVT state. The cycle time was 6 months. We used a societal perspective and a lifetime horizon. Data for transition probabilities between PTS states, transition probabilities in non-PTS states and for mortality, were obtained from the published literature. We assumed no differential mortality by PTS severity. Cost data were obtained from UK national health service tariffs and the published literature. Utilities data were obtained from the published literature. The outcomes of the analysis were mean lifetime costs, quality-adjusted life years (QALYs), and cost-effectiveness measured using incremental cost-effectiveness ratios (ICERs).

RESULTS Over a patient's lifetime, OAC was less costly (£29,770) than CDT (£32,685) but more costly than PMT (£24,435). The mean lifetime QALYs for OAC (14.60) were lower than CDT (14.95) and PMT (14.73). Therefore CDT was more costly (+£2,915) and more effective (+0.36) than OAC, and PMT was less costly (— £4,335) and more effective (+0.13) than OAC. In the incremental cost-effectiveness analysis, the ICER comparing CDT to OAC was £8,128/QALY gained and PMT was dominant (*i.e.* less costly and more effective) than OAC. The results were robust to sensitivity analysis.

CONCLUSION Early interventional treatment of iliofemoral DVT is cost-effective and falls below the U.K. National Institute for Clinical Excellence threshold for cost-effectiveness. Further analysis of modern practice outcomes, alternative treatment modalities and an optimised care models is warranted.

Submitted for the EVF Prize.

2.1 IS COMPRESSION REQUIRED POST RADIO-FREQUENCY ABLATION? - A RANDOMISED CONTROLLED TRIAL

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AIM Post-procedure limb compression, hitherto routine following open varicose vein surgery, has been extended to endovenous procedures. However, no robust evidence exists to support this practice. This study evaluates the clinical and patient reported outcomes with and without use of post-procedure leg compression following radiofrequency ablation.

MATERIALS AND METHODS This single-centre, prospective, non-inferiority randomized controlled trial recruited adult patients, into two groups (A: RFA with compression stocking for 2 weeks, B: RFA alone). Primary outcome was Ultrasound-determined target vein obliteration at 12 weeks. Secondary outcome measures included QOL scores [Aberdeen Varicose Vein Severity Score (AVSS) and Revised Venous Clinical Severity Score (RVCSS)], patient satisfaction, pain score and complications. Assuming 90% power, a Type 1 error of 5%, success rate of 97.5% in compression group, and a success rate in non-compression group no less than 2.5% lower than this in absolute terms, 39 patients were required in each arm. Given the low probability of adverse events and to increase the robustness of the results, ethical approval was obtained to recruit 100 patients.

RESULTS In total, 100 consecutive patients were recruited (A: 51; B: 49) classified as C2-C6 according to CEAP classification. A 94% follow up rate was achieved at 12 weeks. At 2 weeks the occlusion rate of the target vein was similar in both groups at 98.0% and 97.9% (N.=98) respectively with no significant change at 12 weeks (97.9% and 97.8%, N.=94). One patient in each group did not achieve vein occlusion. There was no statistical difference in mean AVSS 5.7 v 5.0 (mean difference -0.7, 95% CI -3.1 to 1.7) and mean VCSS 3.2 v 3.7 (mean difference 0.5, 95% CI -0.7 to 1.7) scores at 12 weeks. With 95.7% survey return rate, a comparable patient satisfaction (A=93.8% vs B=97.8, mean difference 4.0% (mean difference -0.7, 95% CI 9% to 16.2%) and subsequent recommendation for RFA procedure (mean 93.8% vs 97.8%, mean difference 4.0%, 95% CI -7.9% to 16.2%) was achieved in both groups. No difference in pain score 1.9 v 2.0 (mean difference 0.04, 95% CI -0.78 to 0.86) was observed at 12 weeks follow up. Two patients in each group developed deep vein thrombosis at 2 weeks follow up (mean difference 0.2%, 95% CI -12% to 12%).

CONCLUSION The clinical and patient reported outcomes following RFA without compression is no worse than with compression. This trial supports the conclusion that the widely-practised use of compression post RFA adds no clinical benefit for the patients. However, a much larger study, preferably multicentre trial may be required to confirm this conclusion.

2.2 COMPRESSION FOLLOWING ENDOTHERMAL ABLATION - A RANDOMISED CONTROLLED TRIAL

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AIM The management of varicose veins has changed considerably over the past couple of decades. Due to its high clinical- and cost-effectiveness, endothermal ablation is now recommended as the first line method by most international societies. However, the benefit of compression following treatment has been controversial. Hence, a randomised study was undertaken investigating the effects of wearing compression stockings following the endothermal treatment of varicose veins.

MATERIALS AND METHODS Patients older than 18 years of age with evidence of saphenous vein incompetence and receiving endothermal ablation were randomised to receive either 7 days of compression stockings or no stockings. The primary outcome measure was pain score over the first 10 post-operative days. Secondary outcomes included clinical scores, quality of life scores at 2 weeks and 6 months, time to return to normal activities and occlusion rate at 6 months.

RESULTS Two hundred and six patients were randomised, 49.0% of them to the compression group. Mean age was 49.7 (±16) years and 51% were male. Sixty-four percent and 42% of the population attended 2-week and 6-month follow-up, respectively. CEAP classification was 67% C2-C3 and 33% C4-6 in the compression group and 76% C2-3 and C4-6 24% in the no-compression group (Chi-squared, P=0.062).
Significantly better pain scores were noted in the compression group on days 1 to 5 compared to the no compression group, with the mean pain score on day 1 being 29.4 mm in the compression group *versus* 40.4 mm (P=0.041), 22.3 mm *versus* 36.3 mm (P=0.005) on day 2, 19.2 mm *versus* 31.1 mm (P=0.010) on day 3, 20.0 mm *versus* 30.1mm (P=0.019) on day 4 and 18.1 mm *versus* 30.0 mm (P=0.017) on day 5, respectively.
For both groups, the median time to return to normal activities was 2 days while the median time to return to work was 3 days.
At 2 weeks, there were no significant differences in the clinical or quality of life scores (generic or disease specific). At 6 months, the compression group had significantly better mean improvement in their Venous Clinical Severity Scores (VCSS) (2.9 [±1.9] *versus* 1.8 [±1.8]; P=0.011). However, there were no correspondingly significant differences in either the generic or disease specific quality of life scores.
The complete occlusion rate at 6 months was 90% for the compression group compared to 94% for the no compression group (Chi-squared, P=0.606).

CONCLUSION These results indicate that wearing compression stockings following endothermal ablation leads to better pain scores in the first few days after treatment and appears to provide better clinical outcomes at 6 months. Other outcomes, however, showed no differences between the two groups.

Submitted for the EVF Prize.

2.3 PRESSURE DISTRIBUTION IN A LIMB UNDER LOCALIZED COMPRESSION

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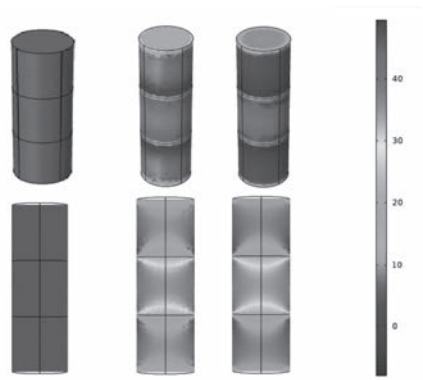
AIM Compression treatment is a cornerstone in managing several conditions affecting the leg. It is not completely understood how applied pressure is distributed in the leg. The laws of Laplace and Pascal are commonly used to explain how an external compression increases tissue pressure. It is distributed both as hydrostatic pressure and stress acting in solid structures. The fluid in the muscle's interstitial space is both in the form of free fluid as well as a gel phase. In theory, the interstitial fluid therefore does not have a uniform pressure distribution. As Pascal's law is valid in an idealized situation, in-vivo tissue pressure measurements differ from the theoretical result. The aim therefore was to estimate the pressure distribution under different material assumptions by basic mathematical modeling and computer simulations.

MATERIALS AND METHODS Laplace's and Pascal's laws were used with a schematic numeric 3-dimensional cylindrical model. Three simulations were performed using different assumptions. Simulations using the COMSOL multiphysics' "Creeping Flow" with a model consisting of water were compared with simulations using "Solid mechanics" and two models of muscle tissue. Simulations were performed assuming 50 mmHg external pressure applied to the midsection of the cylinder. Typical leg tissue mechanical parameters from the literature were used.

RESULTS The pressure distribution differed widely between water and muscle tissue. Figure 1, parts a, c, and e show pressure distribution on the surface of each cylinder, whereas parts b, d, and f show middle-cylindrical pressure distribution. Parts a and b models water, parts c and d models muscle tissue assumed linearly elastic, and parts e and f consist of a hyperelastic model of muscle tissue.

Figure 1.



CONCLUSION The simulations indicate that soft tissues do not act as ideal incompressible fluids, and that Pascal's law alone cannot be used to describe the pressure distribution. Pressure distribution is highly dependent on the assumed viscoelastic properties of the tissues. To be able to understand how compression works on, for instance, a vein or lymph vessel, mathematical simulations can be a powerful tool, but detailed knowledge of the viscoelastic properties in the different tissues of the leg is crucial. The similarities between the two muscle models may be due to limited details in tissue data or that a simple linear model is good enough to capture the pressure distribution. Furthermore, the pressure distribution is highly likely to differ in a leg with edema/abnormally increased interstitial fluid volume compared to a normally hydrated leg. By using a more detailed model and data from different patient groups, the pressure distribution may be better understood and compression treatment improved.

2.4 INTERNAL VEIN COMPRESSION - A SWISS INVENTION

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AIM Therapy of venous insufficiency, formerly consisting mainly of surgery and textile compression, today includes also endovenous thermal ablation, sclerofoam, vein gluing, stenting, and various venotonic or anti-inflammatory medications. As insufficiency usually goes along with vein dilatation, the idea to adjust dilated veins or valve zones by perivenous biocompatible gel injection was established by a Swiss work group in 2013, a potentially comfortable, fully vein saving, non-chemical method. Besides lots of known medical bulking agents like dextranomer, cellulose derivatives, polyacrylate polyalcohol copolymer, polytetrafluoroethylene, polydimethylsiloxane, calcium hydroxyapatite and even acrylates, the best choice for use in phlebology seemed to be cross-linked hyaluronan according to the huge experience with its biocompatibility. There are currently three options: 1) percutaneous valvuloplasty (PVP), aiming at restoration of local valve function; 2) focal venoplasty (FVP), aiming at diameter reduction to modify hemodynamics, and 3) segmental venoplasty (SVP) to reduce diameters as an adjunct to endoluminal procedures.

METHODS AND MATERIALS PVP was studied in 25 patients (17 f, 8 m, 25-54 y., GSM valves, diameter 7.0-12.0 mm), using a 24 mg/l prototype hyaluronan. FVP was evaluated in 19 patients (13 f, 6 m, 26-69 y.) for reflux reduction in GSV, SSV or sidebranch insufficiency (also 24mg/L). SVP was investigated in 40 cases (23 f, 17 m, 41-72 years.) with GSV or SSV insufficiency, adjunctive to Biomatrix sclerofoam (Venartis), using another, less viscous and less durable hyaluronan (16 mg/L). For this collective, target segments were split and randomized to hyaluronan *vs.* NaCl 0.09%.

RESULTS PVP established orthograde flow in 24/25 cases (96.0%). With FVP, 16/19 cases were successful (83.3%) in obtaining alternate (N.=9) or orthograde flow (N.=7), correlating well with clinical improvement. In both applications, medical benefit was unchanged at 6 months FU. With SVP, technical success (>50% lumen reduction) was obtained in all cases (40/40). In all hyaluronan compressed segments, there was no postinterventional pain or discomfort (FU 8 weeks), compared to 36/40 cases (90%) after standard procedures. All hyaluronan applications were without adverse reactions.

CONCLUSION PVP is effective and safe to restore valve function, best suitable for early stages of valve decompensation. FVP for hemodynamic purposes showed feasibility, effectivity and safety, while clear indications need further studies. SVP adjunctive to endovenous ablation significantly improves post-treatment comfort. The choice of hyaluronan instead of more permanent material is justified by the excellent safety results, although PVP and FVP might require maintenance injections in few year´s intervals. However, a revisiting mode would allow individually tailored solutions, instead of failing with “once for ever” actions.

3.1 CONCOMITANT CRANIAL TRIBUTARY ABLATION OF THE SAPHENOFEMORAL JUNCTION FOR LASER CROSSECTOMY OF THE GREAT SAPHENOUS VEIN

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AIM Laser crossectomy of the great saphenous vein (GSV) can be associated with better long-term results because anterior accessory saphenous vein (AASV) insufficiency is one of the most common causes of late recurrence after endovenous thermal ablation (EVTA) of the GSV. However, flush GSV occlusion or AASV occlusion rates are not always satisfactory after attempted laser crossectomy. We investigated the new approach to achieving higher occlusion rates of the AASV after EVTA.

MATERIALS AND METHODS We reviewed 121 limbs in 112 patients undergoing EVTA (1470nm diode laser) using a radial fiber positioned close to the saphenofemoral junction (SFJ). Treated limbs were divided into two groups: GSV with cranial SFJ tributary ablation (group T: 44), GSV ablation only (group C: 81). In group T, the fiber was delivered into the GSV, and advanced to the SFJ. Under ultrasound guidance, the fiber tip was introduced into the superficial circumflex iliac vein (23), the superficial epigastric vein (13) or the common trunk of them (8). After tumescent local anesthesia, the tributary was directly ablated with 50-100J. Subsequently, the fiber tip was taken out to the proximal GSV and the GSV was ablated from near the SFJ. The fiber tip could not be introduced into the tributaries for anatomical reasons in 12 (21%) of 56 limbs with attempted this technique and they were classified in group C. Follow-up examinations using duplex ultrasound were performed 1day, 1 week, and 3 months after EVTA.

RESULTS The AASV occlusion rate in group T was 100% at one day, maintained 100% for 3 months and was higher ($P<0.001$) than that in group C at 3months after EVTA, because the AASV occlusion rate in group C was significantly ($P<0.001$) reduced from 97% at one day to 72% at 3 months due to SFJ recanalization. The flush occlusion (all tributary occlusion) rate was also higher in group T at one day (80% *versus* 62%, $P=0.037$) and 3 months (70% *versus* 31%, $P<0.001$). There were no significant differences in the total laser energy, the treated GSV length, and the treatment time between the groups. EHIT class 3 was found in none of group T and one of group C ($P>0.999$). There was also no difference in the incidence of pain or bruise after EVTA. No other adverse events were observed.

CONCLUSION Concomitant cranial SFJ tributary ablation with laser crossectomy of the GSV is an occasionally technically demanding but safe and effective approach to reduce SFJ recanalization and achieve better AASV occlusion rates after EVTA. Further investigation is needed to confirm long-term efficacy of this technique.

3.2 FEASIBILITY AND SAFETY OF FLUSH ENDOVENOUS LASER ABLATION OF THE GREAT SAPHENOUS VEIN UP TO THE SAPHENO-FEMORAL JUNCTION

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AIM The optimal ablation distance peripheral to the sapheno-femoral junction (SFJ) during endovenous laser ablation (EVLA) of the great saphenous (GSV) vein is still debated. An increased distance could produce higher recurrence rates, whereas a reduced distance poses some concerns about the possible increased risk of endovenous heat-induced thrombosis (EHIT). The aim of this study was to analyse the feasibility, and safety of EVLA up to the SFJ (fEVLA).

MATERIALS AND METHODS This was a single center retrospective review of a prospectively maintained database from September 2017 to November 2018. Consecutive patients undergoing EVLA of the GSV were evaluated at day 1, day 10, and week 6 after the intervention. The primary outcome was the rate of EHIT class 2-4. Secondary outcomes were: the feasibility to perform fEVLA, other procedure-related complications, the closure rate of fEVLA at week 6 (which was categorized in complete closure, partial closure when a GSV segment >5 cm was compressible on ultrasound, and complete recanalization), and the ablation distance at day 1, day 10, and week 6. This distance was categorized into three groups (group 1: > +1 mm = EHIT ≥2, group 2: from -2 to +1mm, group 3 :<-2mm), choosing as a reference (point 0) the SFJ.

RESULTS A total of N.=135 consecutive fEVLA were analysed. Due to tortuosity of the proximal GSV (N.=2), insufficient visualization of the SFJ (N.=1) and dislocation of the catheter into the superficial epigastric vein after tumescent adminstration (N.=5), flush ablation was technically feasible in 127 cases (94,8%). Concomitant miniphlebectomies, and sclerotherapy were performed in 118 (87.4%), and 25 (18.5%) cases, respectively.

All patients completed the follow-up examinations. No EHIT was detected at day one. At day 10, one EHIT class 2, and one EHIT class 3 were detected, both resolved completely after 10, and 19 days of rivaroxaban, thus no EHIT ≥2 was observed at week 6. The target ablation distance (group 2) was achieved in 120 (94.5%), 121 (95.3%), and 112 (88.2%) of the cases at day 1, day 10, and week 6, respectively. No neurological symptoms were observed in the groin region. Complete closure rate at week 6 was 94.5%, with 7 partial recanalisations of the GSV located distally to the proximal third of the thigh. One superficial vein thrombosis and one calf muscle vein thrombosis in the area of miniphlebectomy were observed at day 10, and day 1 respectively.

CONCLUSION This study suggests that fEVLA of the GSV is feasible and safe. Ongoing research is required to prove whether fEVLA can reduce the varicose recurrence rate in the future.

3.3 ENDOVENOUS LASER COAGULATION IN THE TREATMENT OF PATIENTS WITH CONGENITAL ABNORMALITIES OF THE DEEP VENOUS SYSTEM OF THE LOWER EXTREMITIES

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AIM Venous forms of congenital vascular malformations (VSM) range from 49% to 80% of VSM. As studies show, the pronounced pathology of the deep venous system is observed in every 3 patients among the venous forms of VSM.
The aim of the study is to determine the possibility of using endovenous laser coagulation in the treatment of anomalies of the deep venous system of the lower extremities.

MATERIALS AND METHODS In the period from 2015 to 2018 under the supervision were 51 patients with venous forms of VSM with a pathology of the deep venous system, of whom 24 (47%) men and 27 (53%) women. The age of patients varied from 8 to 43 years. The average age was 27±4 years. The main complaints of the patients were the presence of pain, a feeling of pain in the limbs, swelling, and the presence of varicose veins. Examination methods – color duplex angioscanning, phlebography and arteriography of the lower extremities (if indicated). The trunkular (T) forms of venous VSM was detected in 17 (33.3%) patients, the extratrunkular (ET) forms – in 21 (41.2%) patients, the T and ET forms – in 13 (25.5%) patients. According to color duplex angioscanning, "sources" and confluence points (to the iliac veins) with multiple connections to the hypoplastic deep venous system were determined. In the overwhelming number of patients, the defeat of the deep venous system was limited only by segmental hypoplasia of the deep venous system in the area of the presence of VSM.

RESULTS In the presence of T forms, according to color duplex angioscanning, the sources of reflux were determined, as well as the conditions for the possible closure of the venous trunks using endovenous laser coagulation (ELC). In case of ET forms, X-ray endovascular obliteration (EO) of microfistulas was used in 11 (33%) patients to reduce arterial inflow, then ELC was performed. In case of presence of combined forms of VSM at 1 stage was performed EO of microfistulas, then ELC. The ELC technique suggested the closure of the "marginal" vein and anomalous veins of the deep venous system. The method involved the segmental implementation of ELC (in stages) or throughout, depending on the location and extent of the lesion. The tumescent anesthesia was used. In most cases, ELC was supplemented with compression sclerotherapy. All patients were operated in 2-4 stages. Terms between stages lasted for 2-3 months.

CONCLUSION The proposed approaches allowed achieving satisfactory results in all operated patients. It was noted the complete closure of ablated veins.

3.4 RANDOMISED STUDY ON THE INFLUENCE OF FIBRE TIP DISTANCE FROM THE FEMORAL VEIN IN GSV LASER SURGERY

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AIM Changing the fibre tip distance from 2 cm to 1 cm from the femoral vein in GSV laser surgery has a significant impact (the early recurrency rate decreased from 13.8% to 1.2% in our survey). Is there any significance if the distance is shorter?

MATERIALS AND METHODS Between 1 January 2012 and 31 December 2014, altogether 354 GSV varicosities were randomised: the laser fibre tip was 0.5 cm from the femoral vein (group 1: 184 limbs) and 1.0 cm (group 2: 126 limbs). The diameters of the GSV at the junction were between 4 mm and 31 mm (group 1 mean: 7.2 and group 2 mean: 7.4 mm). Diameters were above 10 mm in group 1: 31 and in group 2: 23 cases. To the subjunctional 3 cm 200 J/cm energy was delivered in both groups. Check-ups were performed from 1.5 to 53 months (mean 10.2 months) after surgery.

RESULTS Tributaries were occluded in 78.9 (group 1) and 66.5% (group 2) a significant difference ($P<0.05$). In open tributary cases, epigastric and circumflex veins remained patent. The occlusion of the SFJ was flush with the femoral vein in 66.5 and 69.4% (not a significant difference). During the follow-up, recurrencies were found in the two groups: 6 (3.2%, group 1) and 11 (8.7%, group 2). In 2 cases accessory anterior varicosity (0.5%) (1 and 1) and in 2 cases recanalisation of the GSV (2 in 1.0 cm group) (0.5%) was the reason. Further causes of recurrency were: SSV, perforator vein and remaining varicosities (3, 9, 5 cases respectively). There were no thromboembolic events.

CONCLUSION If the tip of the laser fibre is 0.5 cm from the femoral vein in GSV varicosity laser surgery, recurrency results are better than in 1.0 cm cases, but the difference is not significant. A small but significant improvement was found only regarding tributary occlusion rates. This means that the change in results if the fibre tip is 0.5 cm from the femoral vein is not as great in this study as was found formerly when the distance was changed from 2.0 cm to 1.0 cm. The possible reason for the small improvement is that both in 0.5 and 1.0 cm cases most anatomical sites of SFJ tributary openings were occluded. This short-term study did not show any drawbacks of SFJ tributary occlusion as was feared formerly.

4.1 POSSIBILITIES OF DUPLEX ULTRASOUND SCANNING IN DIAGNOSTICS OF HEMODYNAMIC DISORDERS IN PATIENTS WITH VARICOSE DISEASE OF THE LOWER LIMBS

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AIM Duplex ultrasound scanning (DUS) is a routine diagnostic procedure in patients with varicose disease. DUS mostly evaluates the qualitative (anatomical) parameters of the disease. Still, it is difficult to assess the microcirculation in trophic venous disorders based only on the anatomy, therefore assessment of quantative blood flow parameters is needed. We aimed at determining the possibilities of using a conventional DUS in assessing the hemodynamic disorders in patients with varicose disease.

MATERIALS AND METHODS The study included 583 subjects with varicose disease among which 348 had trophic changes. The patients were divided into 4 groups according to the CEAP clinical classes. Standard Valsava and Siegel tests were performed during DUS. The following parameters were assessed in the superficial and deep veins: venous diameter (D), antegrade blood velocity (antegrade Vpeak), retrograde blood velocity (retrograde Vpeak), reflux time; in the perforator veins (PV) - D, peak velocity (retrograde Vpeak) and mean velocity (retrograde Vmean) of reflux flow. Peripheral resistance index (RI) in the arteries accompanying the PV (PA) was also analyzed.

RESULTS The analyzed parameters are presented on figure 1. A statistically significant difference in the diameter of the GSV was obtained between classes C2 and C3, C3 and C4 ($P<0.05$), but not between classes C5, 6 and C4. Similar findings were observed while assessing the diameter of the PVs and the velocity of retrograde blood flow through them. A gradual increase in these parameters might be associated with the progression of the disease, but a statistically significant difference was obtained only between classes C2 and C3 for the diameter of the PV and the peak velocity of retrograde blood flow. As for the mean blood flow velocity, a statistically significant difference was obtained between classes C2 and C3, C3 and C4 ($P<0.05$). Arteries in the perforator bundles presented with low RI, which may be attributed to the presence of the arteriolo-venular bypasses. Statistically significant differences were obtained for CEAP classes C2 and C3, C3 and C4 ($P<0.05$).

Figure 1.

CEAP	*GSV*					*PV*			*PA*
	D (mm)	*Antegrade Vpeak (cm/s)*	*Retrograde (reflux) Vpeak (cm/s)*	*Antegrade Vpeak Retrograde (reflux) Vpeak*	*N*	*D (mm)*	*Retrograde (reflux) Vpeak (cm/s)*	*Retrograde (reflux) Vmean (cm/s)*	*RI*
C2	5.6±2.2	8.1	15.4	0.53	123	3.1±1.3	24	19	1.0
C3	7.0±2.4	10	26.9	0.37	121	3.75±0.97	39	29.5	0.92±0.09
C4	8.2±2.6	9.1	25	0.36	236	4±1	48.2	41	0.84±0.1
C 5,6	9.1±3.5	11	27	0.4	142	4±1	58.3	47.1	0.82±0.06

CONCLUSION Hemodynamic changes registered during conventional DUS were not associated with the severity of varicose disease. Additional factors rather than hemodynamic may be attributable to the development of venous ulcers.

4.2 IS THE DIFFERENTIAL DIAGNOSIS OF LIPOEDEMA BY MEANS OF HIGH-RESOLUTION ULTRASONOGRAPHY POSSIBLE?

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AIM The current German guidelines on treating lipoedema recommend using flat-knitted compression material and manual lymphatic drainage as well as liposuction. Differentiating lipedema from obesity and asymptomatic lipohypertrophy frequently proves difficult. However, a reproducible and objective differential diagnosis is the foundation of an expedient and cost-effective treatment.

MATERIAL AND METHODS As part of a multi-center registry study (5 centres) ultrasound scans were performed between 1/2016 and 5/2017 on the legs (N.=294) of a total of 147 patients with lipoedema (N.=136), lymphoedema (N.=20), lipoedema with secondary lymphoedema (N.=30), lipohypertrophy (N.=42) and obesity (N.=30), as well as healthy individuals (N.=36). Measurements were performed on the thickness of the cutis and subcutis of the lower and upper leg and on their compressibility. An analysis of the sonomorphology was also conducted.

RESULTS Special sonomorphological properties that allow lipedema to be differentiated from other disease entities and from healthy individuals have yet to be consistently and conclusively identified. The compressibility of the cutis-subcutis complex is completely unspecific and does not allow for any conclusions to be drawn concerning lipoedema. It has not been possible to detect fluid retention in patients with lipoedema (Figure 1 and Table I).

CONCLUSION

1. To date, the qualitative differentiation of the anatomical and pathomorphological features of lipoedema from those of painless lipohypertrophy, obesity and the skin/subcutaneous tissue of healthy persons using sonographic imaging is not possible to a satisfactory degree. Due to the large individual variation in findings and the likewise considerable differences in ultrasound

Figure 1. Compressibility of the cutis-subcutis complex was measured first on minimal contact of the transducer (left) and then after maximum compression (right).

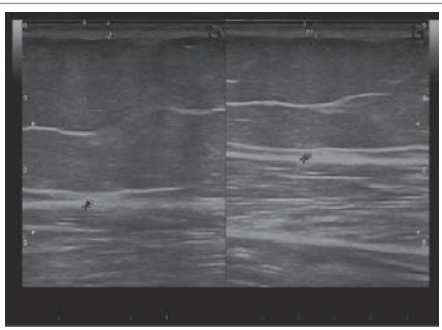

Table I. Demographic data and measurement values of the individual disease entities and of the control group.

	Age (years)	*BMI (kg/m²)*	*Cutis-subcutis complex (cm)*	*Compressibility (%)*
Lipoedema (N.=136)	39.27 ±12.65	29.83±6.75	2.2±0.8	22.2
Lipohypertrophy (N.=42)	42.94 ±12.22	30,74±7.49	1.9±0.7	22.7
Obesity (N.=30)	41.44 ±11.67	46.04 ±10.08	2.7±0.9	25.6
Healthy (N.=36)	50.88 ±17.73	22.44 ±3.24	1.0±0.4	12.7

scanners and their configuration, it is also currently impossible to obtain reproducible results that would enable the individual disease entities to be clearly distinguished.

2. Contrary to expectations, the compressibility of the cutis-subcutis complex is entirely non-specific. No sonographic correlate for clinical phenomena such as the mattress phenomenon could be established.
3. Although ultrasound enables accumulations of interstitial fluid to be demonstrated, it does not provide any indications of oedema aetiology.
4. Since it was not possible to demonstrate fluid accumulations in patients with “painful lipohypertrophy”, the description of this disease as “lipoedema” is misleading and should be re-considered.

   At the present time, it must be assumed that in routine care, essentially only the medical history and clinical findings are available for confirming the diagnosis of lipoedema and its differential diagnosis.

4.3 NON-CATHETER EXTRA CORPOREAL ULTRASOUND-GUIDED HIGH-INTENSITY-FOCUSED-ULTRASOUND (HIFU) TREATMENT IN SUPERFICIAL LOWER LIMB VEINS - FIRST IN HUMAN STUDY FINDINGS

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AIM HIFU is a well established alternative to surgery or other thermal methods widely used for prostate, thyroid, breast fibroadenoma, bone metastasis, essential tremor or uterine fibroma treatment. A first in human prospective open study - approved by the Austrian competent authorities - followed patients treated for incompetent lower limb veins up to 3 months (M).

MATERIALS AND METHODS The Echopulse Theraclion device generates HIFU which penetrates through soft tissues and causes localized hyperthermia (around 85 °C) responsible of irreversible protein denaturation and veinwall coagulation whereas overlying and surrounding tissues are spared, by focusing a beam into a defined target. A focused piezoelectric transducer (3 MHz resonant frequency) engender the ultrasound field. At the center of the transducer, an imaging array of 7.5 MHz is integrated to allow perfect real time imaging alignment of the focal point. No adjunctive methods were allowed during the follow-up.

RESULTS We have several interesting examples of positive results after 3 months follow-up. Most of the cases were performed without anesthesia, were well tolerated and no severe adverse events were observed. None of the patients presented scars or skin pigmentation. The degree of vein tortuosity was a non-issue and no anticoagulants were used.

1. A) A female patient presented recurrence after GSV (Great Saphenous Vein) stripping. No anesthesia was performed. The treated area was occluded acutely and this result is persistent at 3 months.
2. B) A female patient (72 years old) presenting a refluxing stump and a neovascularization after GSV stripping as well as an active ulcer was treated at the groin level – over the stump and neo-vessels area. No anesthesia was performed. The recurrent flow was abolished and the ulcer was healed at 3 months.
3. C) A male patient presenting a refluxing calf perforator was treated after unsuccessful surgery and sclerotherapy. No anesthesia was performed. The perforator was occluded acutely and this result persisted at 3 months.
4. D) A male patient (76 years old) presenting a refluxing GSV and active ulcer was treated after unsuccessful surgery. Tumescent anesthesia was performed. The vein was occluded acutely and this result persisted at 3 months. The ulcer was healed at 3 months.

CONCLUSION In this first study using HIFU for the incompetent lower limb veins, the preliminary results are encouraging and show that this method could become a convincing, innovative and patient friendly alternative non-catheter treatment method in this field. More cases and longer follow-up will be required in the forthcoming studies.

4.4 SCLEROTHERAPY COMPLICATIONS IN THE DAILY OFFICE PRACTICE - LESSON LEARNED

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AIM Sclerotherapy has been satisfactorily used for the treatment of with superficial venous reflux, both telangiectasias (C1) and varicose veins of the lower extremities (C2-C6). Although it seems to be safe and minimally invasive, reports of side effects and complications have been published.
The aim is to describe and report incidence and frequency of side-effects and complications of liquid and foam sclerotherapy in patients with C1 to C6 in CEAP classification and to analyse the results with reference to literature.

MATERIAL AND METHODS 5187 sessions of sclerotherapy (CEAP C1- 22,75%, C2- 52,36%, C3- 4,61%, C4- 14,77%, C5 1,41%, C6-4,11%) among 3414 patients of median age 53 (interquartile range IQR 16-92) were carried out between 2008 and 2018. Data on local and systemic complications immediately after the sclerotherapy session and after 1, 6, and 12 months were obtained and analysed with reference to literature.

RESULTS The complications were divided into local and general complications. Hyperpigmentation and matting were the most common local complications (16.96% and 9.44%, respectively), but were usually transient (permanent 1.4% and 0.6%). 74.4% hyperpigmentations disappeared in 6 months, 94.3% in a year. Other local complications included also superficial thrombophlebitis (4.42%), pyodermia gangrenosum (0.62%) and cutaneous necrosis (0.68%). Pyodermia gangrenosum appeared after telangiectasies and reticular veins sclerotherapy, US-guided foam sclerotherapy of incompetent tributaries and tumescence assisted long catheter US-guided foam scleotherapy. Cardiovascular and general complications included deep vein thrombosis (0.59%), which was usually distal (96.43%) and neurological complications, such as visual disturbances (1.58%) and migraine (0.7%). Transient ischemic attacks were not observed. One patient (0.0002%) had epileptic seizure with apnea and cardiac arrest which was diagnosed as a Sudden unexpected Death in Epilepsy (SUDEP) and one (0.0002%) had anaphylactic shock. Cardiac toxicity (0%) were rarely observed.

CONCLUSION Sclerotherapy is safe and effective method of treatment of patient with C1 to C6 but we should be aware of the possible local and systemic complications.

Figure 1. Number of patients with hyperpigmentations after sclerotherapy in relation to CEAP classification.

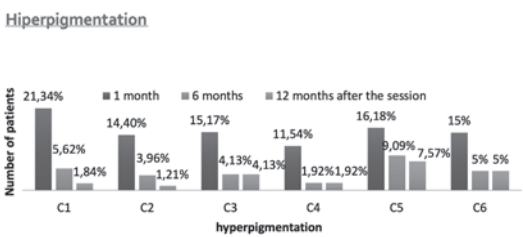


Figure 2. Number of patients with matting after sclerotherapy in relation to CEAP classification.

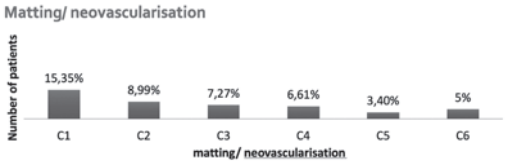


Figure 3. Number of patients with superficial phlebitis after sclerotherapy in relation to CEAP classification.

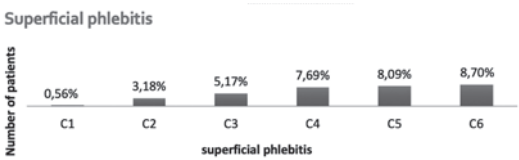


Figure 4. Patient with skin necrosis after sclerotherapy.

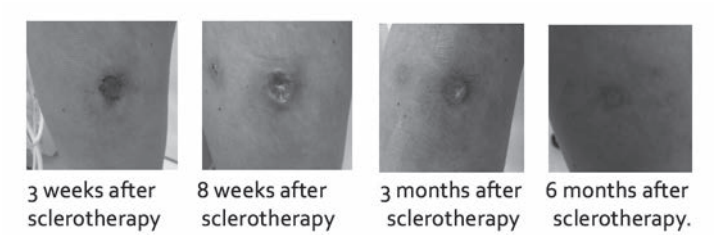
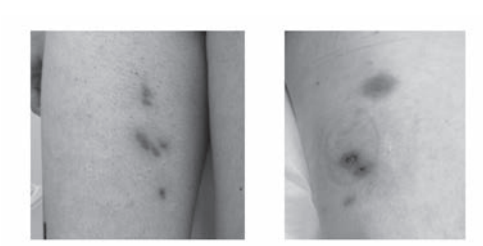


Figure 5. Patients with pyodermia gangrenosum after sclerotherapy.



5.1 THE RELATIONSHIP OF REFLUX PATTERNS TO DISEASE SEVERITY AND HEALTH-RELATED QUALITY OF LIFE SCORES

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AIM In patients with chronic venous disease (CVD), previous work has shown clinical severity and health-related quality of life (HRQoL) to be related to venous diameter, junctional incompetence and reflux patterns in the superficial venous system. This study aims to further determine whether patterns of deep, superficial and perforating venous incompetence correlate to clinical severity and HRQoL.

MATERIALS AND METHOS CVD patients and asymptomatic controls were recruited in a single centre. Participants' superficial, deep and perforating venous systems were assessed using Duplex ultrasound. Scores from the Aberdeen Varicose Vein Questionnaire (AVVQ), Clinical, Etiological, Anatomical, Pathophysiological (CEAP) and Venous Clinical Severity Score (VCSS) were recorded. Participants were stratified into 8 reflux patterns reflecting combinations of deep, superficial and/or perforator reflux. One-way ANOVA with multiple comparisons was used to compare scores between patterns. Participants with any superficial reflux were then further subclassified based on junctional competence and scores were compared between groups using one-way ANOVAs.

RESULTS 490 patients (61.0% female, 54.4±16.6 years) and 105 controls (62.9% female, 36.2±12.3 years) were included. The majority of reflux patterns resulted in increased clinical severity and worse HRQoL when compared to the no reflux group (all $P<0.05$), with the exception of deep reflux only and deep and perforator reflux only groups. Between reflux patterns, all scores were only shown to be higher when comparing the deep, superficial and perforator reflux (DSPR) group against the superficial reflux (SR) only group (CEAP: 3.58±1.34 *vs.* 2.71±1.20, $P=0.001$; VCSS: 6.65±4.56 *vs.* 4.66±3.72, $P=0.013$; AVVQ: 26.2±15.2 *vs.* 17.4±12.7, $P<0.001$). No significant difference was seen between pairwise comparisons of the other reflux patterns.
When considering competence of saphenofemoral (SFJ) and/or saphenopopliteal junctions (SPJ), significantly higher CEAP, VCSS and AVVQ scores were seen when comparing DSPR with either competent or incompetent junctions against SR with competent junctions (all $P<0.05$). This was not observed when compared against SR with incompetent junctions. Additionally, deep and superficial reflux with junctional incompetence showed significantly higher CEAP when compared to SR with competent junctions.

CONCLUSION Greater CEAP classification, VCSS and worse HRQoL scores are seen only when extent of reflux increases from isolated SR to involvement of the deep, superficial and perforator venous systems. While this relationship holds for SR with junctional competence, SR with junctional incompetence displays similar disease severity and HRQoL scores to DSPR with either competent or incompetent junctions.

Submitted for the EVF Prize.

5.2 QUANTITATIVE AND STRUCTURAL CHARACTERISTICS OF MITOCHONDRIAL DNA IN VARICOSE VEINS

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AIM Despite the high prevalence of varicose vein disease, our understanding of the molecular mechanisms underlying its pathogenesis is yet to be clarified. Venous wall composition and morphology of its constituents is substantially changed during vein wall remodeling. Smooth muscle cells of the middle layer that are responsible for venous tone change their contractile function to a secretory one, which may correspond to a decrease in mitochondria in the cells since there is no much need to get energy from them. We aimed to investigate quantitative and structural (in terms of common deletions in the *MT-ND4* gene region) characteristics of mitochondrial DNA (mtDNA) in varicose veins.

MATERIALS AND METHODS The study was conducted in accordance with the principles written in the Declaration of Helsinki and approved by our institutional committee. Patients had a clinical diagnosis of C2–C4 according to CEAP. Exclusion criteria were post-thrombotic changes in deep veins on the leg with VVs and absence of visible VVs. Post-operation material of paired samples (varicose and non-varicose vein segments left after surgery, from a corresponding patient) of great saphenous veins of the lower limbs was used for this study. Total DNAs isolated from the samples (100 in total or 50 pairs – from 50 patients) were taken for the analysis. Determination of mtDNA level (normalized to genomic DNA level) was performed by real-time qPCR using Taq-Man probes and primers. Statistical analysis was performed using Excel and STATISTICA packages.

RESULTS We found that total mtDNA level was decreased in varicose veins compare to non-varicose veins (see the table below for details). However, the proportion of mtDNA deletions was higher in varicose veins on the border of significance.

Table I. Differences in mtDNA quantity and structure between varicose and non-varicose vein condition, according to the Wilcoxon-signed rank test.

Target	*P-value*	*comparison*	*ratio*	*95% CI_low*	*95% CI_high*	*pairs (patients)*
mtDNA	0.016	NV / VV	1.578	0.434	7.290	50
Del*mtDNA	0.045	VV / NV	2.902	0.206	19.838	42

NV: Non-varicose Vein; VV: Varicose Vein; Del*mtDNA: the proportion of mtDNA deletions in the samples.

CONCLUSION We conclude that mtDNA copy number changes are involved in the pathogenesis of varicose veins. Nevertheless, further investigations using a larger sample (considering the stratification for gender, age, time of the disease onset, CEAP class, etc.) are required.
The work was supported by the Russian Science Foundation (Project 17-75-20223 "Investigation of the mechanisms of vein wall remodeling in varicose veins").

Submitted for the EVF Prize.

5.3 PATIENT CHARACTERISTICS AND CLINICAL PRACTICE OF GENERAL PRACTITIONERS AND SPECIALISTS IN CHRONIC VENOUS DISORDERS: RESULTS OF VEIN ACT PROGRAM

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AIM The Vein Act Program (VAP) was an international survey endorsed by the European Venous Forum and mainly designed to assess patients' compliance with nonoperative treatments and their effects on chronic venous disorders (CVD) symptoms.

MATERIALS AND METHODS VAP was an international, observational, prospective program, performed in 7 regions (Russia, Spain, Romania, Colombia, Austria, West Indies, Central America) between 2013 and 2017, which involved adult outpatients with pain in the lower limbs who consulted general practitioners (GPs) 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 Pathophysiologic (CEAP) classification. A case report form was completed listing the patient's clinical presentation, the intensity of symptoms using a 10-cm visual analog scale (VAS) and the adherence to the prescribed medication. After prescribing nonoperative treatments, patients were asked to return for a follow-up visit. We describe here the profile of patients consulting GPs and specialists and the management of CVD provided by each type of physician.

RESULTS The program enrolled 7987 patients. 39% of the patients consulted GPs and 49% specialists. Patients' characteristics regarding gender and BMI were similar in both groups but patients who consulted GPs were in average older compared with patients who consulted specialists (58 years *vs.* 51 years). Patients in C0-C2 stages accounted for 40% of patients who consulted GPs and for 53% of patients who consulted specialists.
Among patients who consulted GPs, 25% had previously consulted for leg problems, in comparison with 38% of patients who consulted specialists. Most patients reported CVD symptoms with an intensity of >5 cm in both patients groups who consulted GPs and specialists (93% and 87% respectively).
Nonoperative treatments (venoactive drugs (VAD), compression therapy, painkillers) were prescribed to 94% of the patients by GPs and to 65% of the patients by specialists. The most frequently prescribed conservative therapy consisted of VAD alone (48%, mainly Micronised Purified Flavonoid Fraction) among GPs and of VAD in association with compression therapy (72%) among specialists. Specialists prescribed VADs for a longer duration and higher strength of compression compared with GPs.
Among patients using VADs, the adherence to the prescribed dosage was similar in both patients groups. In contrast, the frequency of patients who wore their compression therapy as prescribed

was lower in patients who consulted GPs compared with patients who consulted specialists (19% *vs.* 38% respectively).

CONCLUSION VAP provided valuable data regarding the differences between patients' characteristics and the clinical practice of GPs and Specialists in CVD from different geographical zones worldwide.

5.4 ASSESSING VENOUS DISEASE RISK IN DAILY CLINICAL PRACTICE: RESULTS FROM THE VEIN SCORE PROGRAM, A PROSPECTIVE, SINGLE-VISIT, OBSERVATIONAL STUDY

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AIM Chronic venous disease (CVD) covers a range of venous conditions affecting the lower limb including telangiectasia, varicose veins, edema, venous eczema, and venous ulcers. Early diagnosis is important for optimal disease management; however, patients often ignore initial symptoms and consultations occur at later stages of the disease. Risk factors associated with development and progression of CVD include demographic, lifestyle and clinical data. The 11-item Phleboscore is a tool for assessing patient's risk of developing CVD which also may help identify patients at risk of developing a more serious disease. This study aims at evaluating the level of risk of CVD in daily clinical practice settings in India, using Phleboscore.

MATERIALS AND METHODS The Vein Score Program was a single-visit, prospective, observational study in real world clinical practice settings. Patients were to be ≥18 years with complaints of pain, swelling, cramps, edema, or skin changes in the leg or whose occupation required prolonged standing. Patient's data were collected using the Phleboscore questionnaire. A descriptive analysis of the collected data is presented here.

RESULTS Data were collected from 2498 outpatients at 99 clinics all across India. The mean age (±SD) was 47.5±11.6 years, 51.3% of the patients were females, with history of multiple child births in 38% of them. Most patients were above their desired weight (81.1%) and only 20% had an active life-style: 45% patients did not engage in any physical activity and 41.5% patients spent more than 8 hours a day in sitting/standing position; 19.7% of the patients had a family history (for both parents) of varicose veins. Regarding CVD symptoms, 40.5% patients often experienced leg heaviness, 16.1% patients experienced heaviness virtually all the time with considerable pain and 30.9% patients had swollen ankles almost every day. Hot weather was the major aggravating factor for symptoms in 70.3% patients. Using the phleboscore, 7.6% patients were at high risk of CVD and almost three quarters of patients (73.6%) had a median risk for CVD. Overall, a large majority of patients would benefit from life-style changes and appropriate treatment with venoactive drugs or compression for halting the progression of the disease.

CONCLUSION Phleboscore could be an essential tool to assist clinicians in early identification and timely management of patients at risk of CVD. In real world clinical practice settings in India, a majority of patients with a sedentary life-style and/or presenting with complaints of swelling/pain in the lower limb are at moderate risk for developing chronic venous disease and would benefit from life-style modification and appropriate treatment.

5.5 RACIAL DISPARITIES IN THE OUTCOMES OF SUPERFICIAL VEIN TREATMENTS FOR CHRONIC VENOUS INSUFFICIENCY

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AIM Chronic venous insufficiency (CVI) affects over 20 million people in the United States (US). Despite this huge prevalence, there is little data on whether the effectiveness of current CVI therapies for the treatment of symptomatic superficial vein reflux is affected by race. The goal of this investigation was to evaluate CVI treatment outcomes in various races in the United States.

METHODS From January 2015 to December 2017, we retrospectively reviewed, prospectively collected data, from 66,621 patients with CVI. We divided patients into five racial groups: African American (AA), Asian (AS), Hispanic (H), Other (O, race not recorded) and White (W). Presenting symptoms, treatment modalities, number of procedures/patient and pre and post Venous Clinical Severity Scores (rVCSS) were all evaluated. All racial groups were stratified by CEAP class for sub-group analysis.

RESULTS The average age of the entire cohort was 56.8±14.7 with 51,393 females (77%) and 15,228 males (23%). Prevalence by race was 17% AA, 3% AS, 18% H, 8% O and 55% W. There was a higher incidence of C0 disease in W (44%) and AA (31%), C1 and C2 disease in W (45%/55%) and H (27%/25%) and C3,4,5 and 6 disease in W (60%/57%/60%/61%) and AA (19%/18%/19%/21%). Pain as an initial presenting symptom was more common in AA, AS, and H (29%, 29% and 31%). Swelling was highest in AA (18%) and Cramping in H (14%). Skin changes or venous ulcers were most common in AA (16%/21%) and W (63%/61%). With regards to the average number of procedures performed, H (1.98±1.24) and O (2.07±1.25) required fewer stand alone ablations compared to W (2.31±1.56), AS (2.36±1.58) and AA (2.27±1.56), P≤0.0001. With the addition of phlebectomies to ablations, H (3.78±2.08) continued to require fewer procedures compared to all groups, (P≤0.001). When ultrasound guided foam sclerotherapy was added to ablation and phlebectomies, AA required more procedures compared to all races (4.38±2.59, P≤0.01). For stand alone ablations, post rVCSS scores in H (2.18±2.34) demonstrated lower post procedures scores compared to AA (2.79±2.88) and W (2.8±2.85) (P≤0.0001). For ablations + phlebectomies all races demonstrated similar results accept for H (2.19±2.14) who did better than W (2.85±2.75) (P≤0.002). For ablations + phlebs + UGFS all races had similar results (P≤0.0001).

CONCLUSION In the US, CVI is primarily observed in white women. There are differences in the incidence and prevalence of disease severity and symptom presentation based on race. H required the fewest number procedures and AA required the most for optimal results. Post rVCSS scores equalized in all races when ablations were combined with phlebectomies and UGFS.

5.6 EVALUATION OF ILIOFEMORAL AND FEMOROPOPLITEAL VENOUS OBSTRUCTION USING DIGITAL AIR PLETHYSMOGRAPHY

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AIM The accuracy of air plethysmography (APG) for evaluation of venous obstruction is affected by the degree of collateralization and by the volume displacement by the occluding cuff. Use of digital, instead of conventional analog APG data recording, opened an opportunity to significantly modify the protocol and investigate if assessment of venous outflow can be done more reliably.

MATERIAL AND METHODS 36 patients with unilateral post-thrombotic venous obstruction diagnosed by imaging modalities and 10 healthy volunteers were prospectively enrolled in the study. APG signal was digitized and recorded with Data Acquisition Kit DI-145 (DATAQ Instruments, Inc). Occlusion pressure was stepwise increased and then decreased, allowing constructing pressure-volume curves for each extremity. These curves were used to calculate calf compliance, venous resistance and venous outflow fraction (VOF) at different pressures, as well as the time-pressure curves.

RESULTS VOF measured with 80 mmHg occlusive cuff was normal in all healthy volunteers, in 12 of 15 patients with iliofemoral venous obstruction (IFO), and in 9 of 21 patients with femoropopliteal obstruction (FPO). VOF calculated at 30 mmHg occlusion pressure was normal in all healthy volunteers, in 3 of 15 patients with IFO, and in 1 of the patients with FPO. Calculations of the VOF during the 2nd second of time also improved reliability of detection of obstruction. The time that was needed to the volume of the leg to decrease to the value equal to such with 30 mmHg occlusion (T30) was 69+/-31 ms in healthy volunteers, 88+/-43 ms in legs with IFO, and 134+/-31 ms in legs with FPO. A combination of VOF at 30 mmHg pressure and the T30 allowed to accurately diagnose IFO in all but 1 patient, and FPO in 19 of 21 patients.

CONCLUSION Digital APG allows more accurate assessment of venous obstruction, and has a potential for developing specific criteria for differentiation of the levels of obstruction.

6.1 EARLY SUPERFICIAL VENOUS REFLUX ELIMINATION FOR THE TREATMENT OF CHRONIC VENOUS ULCERS

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AIM Chronic venous ulcers (CVU) are quite common and generally have low healing rate (HR) and frequent recurrence rate (RR). Compression therapy is the mainstay of treatment but the long-term results are often insufficient. More than 85% of patients have reflux in superficial veins. Elimination of axial and perforator reflux has been suggested as an adjunctive therapy with compression to reduce RR and accelerate healing (ESCHAR).
An assessment of the efficacy of an attempt based on the early reflux elimination in the CVU treatment. To determine ulcer HR at 24 weeks and 12 months and ulcer RR at one year after early elimination of axial and perforator reflux in addition to compression therapy in patients with active CVU (CEAP:C6).

MATERIAL AND METHODS 114 patients of median age 62 (interquartile range 36-92) years underwent elimination of SVR in addition to compression for treatment of CVU of median duration 16,01 months (IQR 2-120) months. Ultrasound-guided foam sclerotherapy (UGFS) of saphenous vein (SV) and tributaries was performed in 79 patients. Hybrid method-endovenous laser treatment (EVLT) of SV with UGFS of tributaries was performed in 35 patients. Prior to and 1, 3, 6, and 12 months after treatment patients underwent clinical and duplex assessment. Ulcer dimensions were recorded at each visit to calculate healing rates. An obtained database was analysed to determine venous occlusion rates, 24-week and 12-month healing and recurrence rates.

RESULTS 39/114 patients (34.21%) required more than one session of treatment for complete occlusion of great or small SV, incompetent perforators and varicosities. The 3, 6 and 12-month HR were 68.42%, 92.1% and 98.25%, respectively. Two leg ulcers didn't heal 12 months after the first UGFS. The longer the ulcer lasted and the bigger it was, the longer it took to heal. The patients with isolated axial reflux had higher HR than those with axial and perforator incompetence or those with isolated perforator incompetence. The median healing time was 3.37 months (IQR 1-17 months). The estimated 12-month recurrence rate was 4,38%. It was observed that duration of ulceration, large initial ulcer area, history of previous ulcers and deep vein thrombosis and previous surgical treatment of varicose veins had an influence on HR and RR.

CONCLUSION UGFS and hybrid (EVLT+USFS) appear to be an attractive minimally invasive method to treat SVR in patients with CVU. Both are associated with high HR and low mid-term RR. Since long-term patient approval of compression is relatively poor, it may prove more popular, effective and cost-effective to provide a single intervention to reduce recurrence, rather than lifelong treatment with compression.

6.2 INTERMITTENT PNEUMATIC COMPRESSION IN THE PREVENTION OF POSTOPERATIVE VENOUS THROMBOEMBOLISM IN PATIENTS AT EXTREMELY HIGH RISK: THE RESULTS OF IPC SUPER STUDY

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AIM To assess the efficacy and safety of intermittent pneumatic compression (IPC) in the prevention of postoperative venous thromboembolism (VTE) in surgical patients with high VTE risk.

MATERIALS AND METHODS This study was a two-center open randomized clinical trial with a blinded outcome assessor (NCT03044574); the enrolled patients were at extremely high risk for postoperative VTE (≥11 Caprini scores). Participants were randomized into two groups: a control group that received standard prophylaxis with above-knee anti-embolic elastic compression stockings and subcutaneous low-molecular-weight heparin (enoxaparin 40 mg), and an experimental group that utilized additional IPC (Cardinal Health™ Kendall SCD™ 700 system) for the period of immobility. Patients were followed throughout their hospital stay and observed at one and six months after surgery. Duplex ultrasound to detect asymptomatic deep vein thrombosis (DVT) was performed at baseline and every 3-5 days after surgery during inpatient treatment. PECT/CT or CTPA to exclude pulmonary embolism (PE) was performed in cases of clinical suspicion. Autopsy was performed on all deceased patients. The primary endpoint of the study was occurrence of asymptomatic DVT during hospital stay. The main secondary endpoints included symptomatic and asymptomatic VTEs during inpatient treatment and at one and six months after surgery, leg skin injury, and major or clinically relevant non-major bleeding.

RESULTS In total, 407 patients were randomized to the experimental and control groups (204 and 203 respectively). There were 160 men and 247 women with a mean age of 68.8±9.8, who underwent major abdominal (68.3%), thoracic and neck (7.9%), gynecological (8.6%), urological (7.3%) or cranial (7.9%) surgery with the mean duration of 165.3±77.7 min. Mean Caprini score was 11.4±1.9. Groups had similar baseline Caprini scores. The presence of a malignant tumor was the indication for surgery in 83% of patients.
The median hospital length-of-stay was 10 days in both groups. Primary endpoint was observed in 1 of 204 patients (0.5%; 95% CI: 0.1-2.7%) in the experimental group and 34 of 203 patients (16.7%; 95% CI: 12.2-22.4%) in the control group (P<0.0001). PE incidence was 0% *vs.* 2.5% (P=0.030) and fatal PE was 0% *vs.* 1.5% (P>0.05). The 30-day incidence of VTE was 0.5% and 18% (P<0.0001). At six months 80% of patients were followed-up, and no new VTE events occurred. Leg skin injury was detected in 12.3% *vs.* 7.4% and bleeding in 3.4% *vs.* 5.4% patients in the experimental and control groups, respectively (P>0.05).

CONCLUSION Combination IPC and standard prophylaxis reduced the incidence of postoperative VTE in patients at extremely high risk without increasing rates of leg skin injury or bleeding.

6.3 ENDOVASCULAR MANAGEMENT OF CHRONIC ILIOFEMORAL VENOUS THROMBOSIS – A SYSTEMATIC REVIEW AND META-ANALYSIS

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AIM Chronic iliofemoral venous thrombosis (CVT) is a major health problem worldwide, frequently resulting in chronic venous insufficiency and in the post-thrombotic syndrome, at the same time having a great economic social and psychological impact worldwide. Venous thrombosis can result from various etiologic factors such as external pressure or anatomical diversities (May-Turner Syndrome), acute or chronic deep venous thrombosis whereas the symptomatology depends on the cause, extent and duration of the disease. Among the most serious complications of the disease is the post-thrombotic syndrome which appears in 20% to 100% of patients despite contemporary treatment, having a negative influence on the Quality of Life (QoL) of these patients. Therapeutic anticoagulation for CVT represents the gold-standard treatment despite high morbidity rates. Although endovascular management of acute iliofemoral venous thrombosis has been reported as a promising and effective treatment option in recently published societal guidelines, its role on CVT management has not been sufficiently described.

MATERIALS AND METHODS We conducted a systematic review and metanalysis of the current literature for the efficacy of endovascular treatment of CVT in terms of patency and its effect on the quality of life of patients. We interrogated electronic bibliographic sources using a combination of free text and controlled vocabulary searches to identify studies reporting on endovascular management of CVT. We conducted our review according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement standards. We applied fixed-effect or random-effects models to calculate pooled prevalence estimates.

RESULTS We identified 23 observational cohort studies reporting a total of 2288 participants (709 men and 1579 women). Mean age of participants ranged across the studies from 18 to 85 years. Mean follow up was 18 months and positive thrombophilia screen was noted in 35% of included patients. Mean intervention time was 7.3 years, technical success was 92.8% (95% CI 93 to 97), 30-day stent occlusion and stent restenosis rates were 4.7% (95% CI 3 to 5) and 16.9% (95% CI 14 to 18) respectively. Primary patency rates at the 1st, 2nd, 3rd and 4th year of follow up were 97.6%, 93.3%, 81.9% and 54.9% respectively. Similarly, primary-assisted patency rates were 98.5%, 96%, 91.7% and 83.3% respectively whereas secondary patency rates were 98.6%, 97%, 93.8% and 87% respectively. QoL measurements were improved after the intervention compared to preoperative values.

CONCLUSION Although endovascular management of acute iliofemoral deep venous thrombosis has been recommended by societal guidelines, its role in chronic settings remains not well defined. However, endovascular treatment of CVT has been shown to reduce the severity of post thrombotic syndrome and improve QoL in treated patients.

6.4 SINGLE CENTER EXPERIENCE WITH OPEN AND ENDOVASCULAR TREATMENT OF THE NUTCRACKER SYNDROME

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AIM Nutcracker syndrome (NS) is a rare condition consisting in left renal vein (LRV) compression between the superior mesenteric artery and the aorta (Anterior NS) or between the vertebral column and the aorta (Posterior NS). Although uncommon, diagnosis is challenging due to the variable and aspecific presentation. Morbidity can be associated with pelvic congestion syndrome, chronic kidney disease from long-term LRV hypertension, increased risk of LRV thrombosis, dysmenorrhea, dyspareunia.

MATERIALS AND METHODS All data from patients who underwent NS treatment was collected in retrospective database, with particular interest on technical success, short- and long-term results.

RESULTS From 1992 to 2017, 93 consecutive patients underwent NS treatment. Seventy-one patients have been treated conservatively, while 22 patients presenting severe symptoms (20 females, age range 17-45) were treated after accurate diagnostic workup. All patients underwent duplex ultrasound and a second level diagnostic imaging exam; a phlebography has been performed in 20 cases (91%). Twenty cases (91%) were ANS, two cases (9%) PNS. Surgical repair was performed in 21 cases (95%), while endovascular approach was performed only in one case (5%) of ANS. Distal transposition of the LRF on the inferior vena cava (IVC) was performed in 19 cases (86%). Two patients (9%) underwent anterior reimplantation of a retro aortic LRV on the IVC. We did not encounter any perioperative death and all patients were discharged with an uneventful postoperative course. Follow-up has been performed with a duplex ultrasound at six months and yearly thereafter. Long-term patency of the transposed LRV is 91%. One patient suffered an asymptomatic occlusion of the LRV which was treated endovascularly with a stent placement. Symptoms resolutions was achieved in 20 patients (91%).

CONCLUSION Surgical treatment of NS is effective, safe and feasible; distal transposition of the LRV on the IVC appears to be the gold standard. Endovascular approach is feasible, but the use of dedicated devices should be studied in the long-term.

PR1 A POPULATION-BASED ASSESSMENT OF MORTALITY IN PATIENTS WITH VARICOSE VEINS

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AIM Conventional wisdom suggests that varicose veins (VVs) develop because of pathological processes affecting the venous wall and/or valves; these produce changes that lead to vein malfunction and lower extremity pain, swelling, skin changes, and other manifestations of venous disease. If this view is correct, these "degenerative" processes (which could also potentially affect veins throughout the body) might adversely impact other health outcomes, including overall mortality. To explore this possibility, we assessed the impact of VVs on survival in a well- described, well-defined population (Olmsted Co., MN, USA).
The aim is to assess the impact of varicose veins on survival.

MATERIALS AND METHODS Subjects age 18 or older participating in the Rochester Epidemiology Program between 1979 and 1985 were eligible for inclusion. 3712 subjects were selected; 1856 carried a diagnosis of VVs (based on ICD-9 codes), and 1856 were controls without a diagnosis of VVs. The groups were age- and sex-matched (both groups averaged 54 years of age and 75% females/25% males). All individuals were followed until death or last contact using Kaplan-Meier analysis. Expected survival was based on Minnesota Vital Statistics, and comparisons to observed survival were based on the one-sample log-rank test. Survival was compared between cases and controls using proportional hazards modeling.

RESULTS When survival is compared to predicted survival for comparable subjects, the observed survival for those with VVs is actually better than the predicted survival for this cohort (one-sample log rank P-value <0.001). The two-sample comparison of survival between cases and controls results in a hazard ratio (HR) of 1.07 favoring VVs subjects, P=0.14. In a sub-group analysis of younger subjects (those between 18-49 years of age at the start of the study) the beneficial effect of VVs on late survival (after 20 years) is even more dramatic, with an HR of 1.76 (P=0.003) favoring late survival in subjects with VVs over those without.

CONCLUSION Survival is not worse in subjects with VVs; paradoxically, it is actually much better. This observation suggests that the usual pathological explanations for VV formation may be imperfect or wrong. Rather than suffering from a purely destructive processes that causes vessel wall "degeneration," subjects with VVs may have enhanced "pro-angiogenesis" or "pro-vascular remodeling" tendencies that are associated with both negative (VV formation) and positive (better overall survival) effects on health.

PR2 RESULTS OF SURGICAL TREATMENTS FOR VENOUS STASIS ULCERS

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AIM Venous stasis ulcers are refractory and can seriously impair a patient's quality of life. Surgical treatments for these ulcers involve improvement of venous stasis. This study aimed to examine the postoperative improvements in subjective and objective symptoms and venous functions in patients with venous stasis ulcers according to different types of surgical procedures.

MATERIALS AND METHODS We surgically treated 65 limbs of 60 patients with venous stasis ulcers (CEAP classification: C6) between October 2011 and May 2017. The surgical procedures included combined saphenous vein stripping or endovenous laser ablation (EVLA) and subfascial endoscopic perforator surgery (SEPS; 44 limbs, SE+SEPS group), SEPS alone (12 limbs, S group) and EVLA alone (9 limbs, E group). The patients were followed up on an outpatient basis at postoperative 1, 2, 6 and 12 months to examine the ulcer healing rate. Subjective and objective symptoms were evaluated using the venous clinical severity score (VCSS), whereas venous functions were evaluated using air-plethysmography to measure the venous filling index (VFI) and venous volume (VV). We compared preoperative and postoperative results for each surgical procedures and compared the different surgical procedures.

RESULTS Ulcer healing rates according to surgical procedure at postoperative 1, 2 and 12 months were as follows: SE+SEPS group: 64.3%, 88.1% and 90.5%, respectively; S group: 63.6%, 90.9% and 91.2%, respectively; and E group: 71.4%, 71.4% and 71.4%, respectively. Notably, the healing rates did not substantially differ among the three surgical procedures. No relapses were observed during the observation period. VCSS preoperatively and at postoperative 1 and 12 months was as follows: SE+SEPS group: 14.6±4.0, 5.3±2.8 and 3.3±2.6, respectively; S group: 15.1±4.2, 6.1±3.0 and 3.6±2.3, respectively; and E group: 13.6±2.5, 5.0±2.6 and 3.3±1.0, respectively. Significant postoperative improvement was observed in all groups. However, no significant differences in VCSS were observed relative to surgical procedure. The venous functions (VFI and VV) were respectively as follows: SE+SEPS group: preoperative, 7.5±4.2 and 140.4±69.3 and postoperative 12 months, 3.7±2.5 and 93.4±46.3; S group: preoperative, 6.8±4.1 and 129.9±68.3 and postoperative 12 months, 3.3±2.6 and 93.7±44.8; and E group; preoperative, 6.0±3.3 and 117.2±55.2 and postoperative 12 months, 2.7±1.2 and 94.1±22.7. Significant postoperative improvement was observed in all groups in this regard, with no significant between-group differences relative to surgical procedure.

CONCLUSION We achieved good outcomes following surgeries for venous stasis ulcers, regardless of the surgical procedure. The short-term treatment results and improvements in subjective and objective symptoms of the E group were approximately identical to those of the SE+SEPS group; thus, SEPS may be considered a second stage for patients with unhealed ulcers or those who experience relapse.

PR3 CLINICAL CHARACTERISTICS, MANAGEMENT STRATEGIES, AND LONG-TERM OUTCOMES OF ASYMPTOMATIC LOWER EXTREMITY DEEP VEIN THROMBOSIS IN PATIENTS WITH ACTIVE CANCERS

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AIM Recently, leg vein ultrasound has become common in patients at high risk for or with suspected lower extremity deep vein thrombosis (DVT). The frequent use of ultrasound has led to an increased number of diagnoses of incidental asymptomatic DVT, especially among patients with active cancers. However, asymptomatic DVT has not been adequately studied, and even the prognosis of asymptomatic DVT is still unclear. The aim of this study was to evaluate the clinical characteristics, management strategies, and long-term outcomes of asymptomatic lower extremity DVT detected on ultrasound in the daily clinical practice focusing on patients with active cancers.

MATERIALS AND METHODS The current study was an observational single-center retrospective cohort study enrolling consecutive patients with asymptomatic lower extremity DVT detected on ultrasound of leg veins at Kyoto University Hospital between January 2010 and September 2015. Among the 4514 consecutive patients who underwent ultrasound of leg veins during the study period, 552 patients were diagnosed as having DVT. After excluding 111 patients with symptomatic pulmonary embolism, 135 patients with symptomatic DVT, and 6 patients with inferior vena cava thrombus, the current entire study population consisted of 300 patients with asymptomatic lower extremity DVT. We evaluated clinical characteristics and outcomes focusing on patients with active cancers.

RESULTS Patients with active cancers accounted for 120 (40%) and were more frequently received prolonged anticoagulant therapy beyond the acute phase than those without (active cancer: 84% *vs.* non-active cancer: 73%, P=0.02). Among the entire population, the cumulative 5-year incidences of symptomatic recurrent venous thromboembolism (VTE), major bleeding, and all-cause death were 14.5%, 16.6%, and 34.1%, respectively. There were no significant differences in the cumulative 5-year incidences of symptomatic recurrent VTE between patients with active cancers and those without (21.2% *vs.* 11.7%, P=0.25). Among the entire population, anticoagulant therapy was associated with a significantly higher incidence of major bleeding compared with the non-anticoagulant group (anticoagulant: 20.5% *vs.* non-anticoagulant: 1.5%, P=0.01), whereas, there were no significant effect on the incidence of VTE (11.8% *vs.* 22.9%, P=0.23). Similarly, in patients without active cancers, there were no significant effect on the incidence of VTE (HR, 1.23; 95%CI: 0.30-8.30, P=0.79). However, in patients with active cancers, the favorable effect of anticoagulants relative to no anticoagulants for VTE was significant (HR, 0.22; 95%CI: 0.05-0.95, P=0.04).

CONCLUSION Prolonged anticoagulants therapy was implemented in the majority of patients with asymptomatic DVT, but was associated with a significantly higher risk for major bleeding. However, in patients with active cancer, there appeared to be a benefit of prolonged anticoagulant therapy in decreasing the rate of symptomatic recurrent VTE.

EP1 RISK FACTORS AND CLASSIFICATION OF RE-INTERVENTION FOLLOWING DEEP VENOUS STENTING FOR ACUTE ILIOFEMORAL DEEP VENOUS THROMBOSIS

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AIM Acute iliofemoral deep venous thrombosis (DVT) is strongly associated with the development of post thrombotic syndrome (PTS). Thrombolysis and deep venous stenting can, however, restore vessel outflow and reduce PTS in accordance with the open vessel hypothesis. For a proportion of patients re-occlusion or stenosis will occur and a further intervention is required. In this study our aim was to determine the causes of re-occlusion and stenosis following deep venous interventions for acute iliofemoral DVT.

MATERIALS AND METHODS A retrospective single centre cohort study of patients successfully lysed for treatment of iliofemoral DVT between November 2013 and 2017 was carried out. Patient records and imaging were examined for: baseline demographics, risk factors, extent of DVT, extent of vessel clearance, stents inserted, quality of in-flow, time to and success of re-intervention, anticoagulation compliance, and secondary vessel patency. Failure was classified as either technical, haematological, flow related or mixed. Technical causes were further subdivided into lack of stenting, failure to address inflow or outflow and device related failure.

RESULTS 143 limbs were identified: 95 without further intervention and 48 limbs (34%) requiring re-intervention. Median time to re-intervention was 45 days with 45% of cases occurring in the first 6 weeks. A total of 31 cases (67%) had successful re-intervention. This was achieved in all cases managed prior to complete vessel occlusion compared to 8/25 (32%) of those presenting with complete occlusion (P=0.001).
Need for re-intervention was associated with IVC involvement (13% *vs.* 35%, P=0.002), presence of a stent across the inguinal ligament (15% *vs.* 38%, P=0.002) and interestingly, a younger median age (44 *vs.* 31, P=0.002). Post-procedurally, non-compliance with anticoagulation was found to be strongly associated with re-occlusion: relative risk 3.17 (95%CI 0.29-0.91, P=0.0001). Technical problems were observed in 54% of re-intervention cases. Four were due to stent fracture or compression. Haematological issues were observed in 33% of re-intervention cases, flow-related issues in 44% of re-intervention cases, and in 27% of cases, problems were multifactorial. Overall vessel salvage was achieved in 71% of cases with a single causative factor compared to 54% of cases classified as multifactorial. This did not translate into a statistically significant difference in secondary patency.

CONCLUSION A large proportion of patients required re-intervention due to potentially preventable factors. This study emphasises the need for precision in stenting technique, for post-procedural surveillance and adherence to anticoagulation in order to optimise patient outcome.

EP2 A NOVEL METHOD OF ASSESSMENT OF MICROCIRCULATORY CHANGES WITH THE USE OF GEKO™ DEVICE IN PATIENTS WITH VENOUS LEG ULCERS

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AIM The Geko™ device, powered by OnPulse™ neuromuscular electrical stimulation technology, has been recommended for use in the prevention of DVT and leg swelling as well as in the treatment of venous leg ulcers and arterial ischaemia. The standard practice in the treatment of venous leg ulcers involves use of compression bandaging, if not contraindicated. Studies have shown changes in the microcirculation environment in the wound bed and peri wound area in patients with venous ulcers. In this study, we have examined the microcirculatory flow in both the wound bed and the peri-wound area using Laser Specle Contrast Imaging (LSCI).

MATERIALS AND METHODS This prospective study was approved by the Hospital Ethic Committee. Sixteen patients with chronic venous leg ulcers eligible for the study according to the inclusion criteria were recruited from the complex wound clinic. LSCI is a non-invasive and non-contact technique that is used to measure the changes in microcirculatory flux in the skin or other areas where blood vessels are superficial. This has shown to accurately measure blood flow over moving skin surfaces. Each patient was examined in a recumbent position with the leg outstretched resting on an evacuated bean bag cushion to immobilise the leg for measurements. A reference marker, consisting of an opaque foil strip, was affixed to the skin adjacent to the wound, to allow for correction of movement artefact. The LSCI imager was positioned to record images in the wound bed, peri-wound area and the reference marker. Measurements were made of Baseline (following a 10-minute stabilisation period with the patient at rest in recumbent position) and with the Geko fitted and active for 10 minutes with the patient at rest in recumbent position.

RESULTS The baseline flux values over 15 seconds suggested a pulse of 72 beats per minute (BPM) with a mean flux of 106 arbitrary units and the pulse amplitude (PA) of 12 units. With the Geko active (60 BPM), there was elevation of mean flux from 106 to 224 arbitrary units. The PA increased from 12 to 102 units. In the wound bed and peri-wound area, Geko produced a substantial and significant ($P=0.014$, $P=0.004$) increase in flux. Geko had an even more pronounced and highly significant ($P<0.001$, $P<0.001$) effect on pulsatility (PA) in both the wound bed and peri-wound area.

CONCLUSION These results confirm that the Geko device improves the microcirculatory environment in the wound and peri-wound area and may be beneficial in wound healing.

EP3 MPFF REDUCES THE RISK OF ADVERSE REACTIONS FOLLOWING ENDOVASCULAR TREATMENT OF VARICOSE VEINS

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AIM The study was aimed at assessing the efficacy and safety of periprocedural use of micronized purified flavonoid fraction (MPFF) in patients with chronic venous disease (CVD) who underwent endovascular intervention including endovenous laser obliteration radiofrequency ablation, foam sclerotherapy or their combination.

MATERIAL AND METHODS This was a national, multicenter, observational study in adult outpatients with CVD class C2 according to the clinical, etiological, anatomic, pathophysiologic (CEAP) classification, requiring endovascular treatment. The medical management including pharmacological drug therapy corresponded to the routine clinical practice, instructions for medical use of medicinal products, and the specific clinical situation.
At the 4-week follow-up visit, the rates of adverse reactions to the endovascular procedure (such as ecchymosis, hematoma, paresthesia, thrombophlebitis, pigmentation, and heat-induced thrombosis) were evaluated. Chi-square tests were used to compare the proportion of patients reporting adverse reactions in patients treated with MPFF and those not treated (control group).

RESULTS A total of 1519 patients were included in the study. At inclusion, periprocedural treatment with MPFF was prescribed in a majority of patients (1202 patients; 79.1%) while 317 (20.9%) patients did not receive any venoactive drugs. Among treated patients, MPFF was mainly prescribed at 1000 mg/day (1020 patients, 85%) while 500 mg/day was prescribed in 182 patients (15%). The treatment duration was 60 days or more in a majority of patients treated (69.3%). Adherence to treatment was satisfactory, as most patients (1039 patients; 86.4%) were treated with MPFF throughout the follow-up period. In treated patients, the frequencies of the following adverse reactions associated with endovascular procedure were significantly lower, compared to the control group: ecchymosis 7.1% *vs.* 11.0% (P=0.01), paresthesia 0.5% *vs.* 1.7% (P=0.02), pigmentation 0.6% *vs.* 3.3% (P=0.001), and heat-induced thrombosis 0.3% *vs.* 1.3% (P=0.02). The frequencies of hematoma and thrombophlebitis were numerically lower in patients treated with MPFF, although no statistically significant differences were found: 0.5% *vs.* 1.3% (P=0.1) and 0.2% *vs.* 0.6% (P=0.2), respectively. The total rate of adverse reactions to endovascular procedure in patients treated with MPFF was 2 times lower compared to the control group (7.6% *vs.* 15.0%; P<0.001).

CONCLUSION MPFF treatment in the periprocedural period provides a substantial reduction in the rate of adverse events typically associated with endovascular treatment of varicose veins. These findings should be confirmed in randomised studies. However, results of the present study suggest that adjuvant therapy with MPFF may be considered in routine clinical practice when performing endovascular procedures.

EP4 RANDOMIZED COMPARATIVE TRIAL COMPARING THREE ENERGY SETTINGS IN ENDOVENOUS LASER ABLATION FOR CHRONIC VENOUS DISEASE

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AIM In a previous study of our group we demonstrated that, in endovenous laser ablation (EVLA) for chronic venous disease treatment, same linear endovenous energy density (LEED) with different power setting is associated with significant different effects on vein wall damage and tissue depth penetration.
Aim of this investigation is to compare the same three energy settings in their clinical effects in terms of vessel recanalization and procedural pain.

MATERIALS AND METHODS 154 chronic venous disease legs (C2EpAsPr) were randomized for EVLA at 5W (50 patients), 7W (57 patients), 10W (47 patients). All the procedures were performed at 70 J/cm. Pain was evaluated by visual analog scale (VAS) at 1 day, 1 week, and 2 months after EVLA. Recanalization was assessed at 6 months.

RESULTS Pain at day 1 was rated as 0 (1 quartile 0; 3 quartile 1) in the 5 W group, 0 (1 quartile 0; 3 quartile 1) in 7W group, 0.5 (1 quartile 0; 3 quartile 2) (P=0.355) in 10W group.

Administration of painkillers showed no difference in the 3 groups (χ^2=0.236; P=0.889). No difference was reported in pain at 1 week and 2 months (1week P=0.317; 2 months P=0.569). No GSV recanalization was reported at 6 months in all patients.

CONCLUSION EVLA at different power settings with the same LEED is not presenting significant differences in terms of pain and recanalization, despite the previously demonstrated difference in vein wall damage.

EP5 RADIATION AND CONTRAST FREE CATHETER-DIRECTED THROMBOLYSIS FOR EARLY PREGNANCY RELATED MASSIVE ILIOCAVAL DEEP VEIN THROMBOSIS

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AIM Deep vein thrombosis (DVT) is a major complication that occurs in 1.36 per 1000 pregnancies, with pulmonary embolism being a leading cause of maternal morbidity in developing countries. Anticoagulation therapy only inhibits thrombus propagation and provides prophylaxis against pulmonary embolism. Iliofemoral DVT is associated with a high risk of post-thrombotic syndrome. Treating DVT in pregnancy with anticoagulation alone results in a high rate of post-thrombotic morbidity and impaired quality of life in this group of young patients. Due to the bleeding risk of systemic lysis and the high risk of rethrombosis after surgical procedures, catheter-directed thrombolysis (CDT) for iliofemoral DVT has been established. Administering rt-PA directly into the venous clot allows for a significant dose reduction compared to systemic thrombolysis. There are concerns about the effects of radiation exposure on the fetus during pregnancy. We report on a first in men CDT procedure without radiation and contrast exposure in a first trimester pregnant patient with massive thrombus extending from the proximal part of the left common femoral vein to the suprarenal inferior vena cava.

MATERIALS AND METHODS After insertion of a 6-F sheath, a hydrophilic guidewire and a standard angiographic 4-F diagnostic catheter were used to pass the thrombus. Ultrasound guidance was performed with B-mode ultrasound tracking the inserted catheter material in the iliofemoral veins and inferior vena cava. The angiographic catheter was then exchanged for the drug delivery catheter with a treatment zone corresponding to the length of the thrombotic occlusion. After introduction of the thrombolysis catheter the patient was transferred to the intermediate care unit and the thrombolysis infusion was started with rt-PA at a rate of 2mg/h for the first 5 hours, then reduced to 1mg/h over 10 hours. Unfractionated heparin infusion was administered to achieve an aPTT corresponding to therapeutic heparin levels. After 15h of treatment, ultrasound confirmed complete thrombus resolution in the left iliofemoral vein as well as in the inferior vena cava. Anticoagulation with intravenous heparin was switched to low-molecular heparin subcutaneously. An obstetric exam with ultrasound confirmed normal vital gestation and the patient was discharged the same day. At 37 5/7 week of gestation, the patient delivered a healthy boy by caesarian section.

CONCLUSION Iliofemoral DVT in pregnant women raises a unique therapeutic challenge. In our case, we performed a successful CDT procedure in a pregnant woman in the first trimester without complications. To prevent radiation exposure the placement of the lysis catheter was realized with ultrasound guidance. Further trial or registry experience is needed to demonstrate the efficacy and safety of this therapeutic approach.

EP6 EXPERIMENTAL SINGLE-STEP ELECTRIC WELDED CONNECTION OF VESSELS

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AIM Currently, in the surgery of vessels for their connection is used exclusively the method of manual vascular suture. This method has several disadvantages, in particular, a long time of execution and the need for special training of the surgeon. Of particular importance is the work of the surgeon during the fighting, when a lack of time leads to fatal consequences. At the same time, the hardware (apparatus) suture of the great vessels did not find a place in practical surgery. We have created a special toolkit and method for the implementation of a one-stage circular anastomosis of vessels using the Ukrainian technology of high-frequency electric welding.
Aim: experimental investigation of the using of electric welding devices for a single-step connection of veins with medium and large diameter.

MATERIALS AND METHODS The apparatus "EKZ-300-5" (Ukraine) and the tool "Approximator", which was developed by a team of researchers, was used as an apparatus for of high-frequency electric welding of living tissues. The objects of the study were common and external iliac cadaveric veins. Evaluation of the quality of vascular anastomosis was performed macroscopically, histologically and physically by the methods of determining injection pressure (measuring the strength of the welded joint). The results of the welded anastomosis were compared with the standard method on the same vascular experimental models.

RESULTS After performing a welded anastomosis on the veins, we measured with a manometer their strength (when water was pressurized into the vessel). We received 10 cases of macroscopically circular intact anastomosis and 2 cases of anastomotic leaking. Welded anastomosis withstand pressure up to 800 mmHg. 2 failed anastomoses were analyzed for reasons that led to the improvement of the "Approximator" instrument construction.

CONCLUSION 1) A single-step welded vascular anastomosis can potentially become an alternative to the standard method; 2) when performing an experiment on a cadaver, it is possible to obtain macroscopically intact venous anastomoses; 3) the destruction of the anastomosis occurs during the injection of water into the vessel under a pressure of more than 800 mmHg. in the group of welded methods and under pressure of 950 mmHg. in the group of standard methods.

EP7 LONG-TERM RESULTS OF OPEN PHLEBECTOMY WITHOUT LIGATION OF PERFORATOR VEINS

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AIM Until 2000s, elimination of horizontal reflux along with vertical one was among the main objectives of open surgical treatment of patients with varicose disease. In the last decades authors such as Mendes R. (2003) reported that up to 80% of incompetent perforator veins (PVs) restored its function following the removal of the superficial veins. The longest follow-up period reported up to date was 2 years. We aimed at evaluating long-term (5 years) results of open phlebectomy without ligation of incompetent PVs.

MATERIALS AND METHODS 101 patients with varicose disease were subjected into two groups according to the CEAP classification: clinical class C2 – 58 patients, C3 – 43. DUS was performed in all subjects. PVs were considered incompetent if reflux time exceeded 0.5 seconds. All subjects underwent open phlebectomy including stripping of the great saphenous vein and removal of its tributaries with Muller hooks; no additional incisions were performed to ligate PVs; superficial veins, which drained into incompetent PVS were removes with Muller hooks.

RESULTS Preoperatively, 147 PVs were identified: 79 PVs in subjects with CEAP clinical class C2, 68 –CEAP clinical class C3. At 6 months after surgical treatment 51 PVs were identified, which accounted for nearly a 1/3 of the total number of preoperatively identified PVs. At 2 years after the open phlebectomy the number of identifiable PVs was similar; there were no clinical signs of the recurrent varicose disease; 60.8% of PVs had no signs of incompetence. At 5 years after open phlebectomy, 58.8% of identifiable PVs were competent. Most of the incompetent PVs had an initial diameter of more than 3.5mm and presented with a segmental reflux along the deep veins at the level of confluence with PVs.

CONCLUSION A 58.8% competence rate in initially insufficient perforator veins was identified at 5 years after open phlebectomy involving removal of superficial veins only. Larger diameter of the perforator veins and presence of deep venous reflux were associated with incompetence of perforator veins in long-term period.

EP8 LOWER LIMB OEDEMA IN MODERATE SUPERFICIAL VENOUS DISORDERS IS NOT ONLY AN ANKLE OEDEMA

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AIM Oedema is a complication of superficial venous disorders whose frequency is ranged from 2.2% to 13.4% in epidemiological studies using CEAP classification. It is generally considered that, due to gravity, oedema in the lower limb is greatest at the ankle area level. However, from a few already published experiments using air pressotherapy, a possible equal distribution in the area below knee to foot is hypothesized. This assumption was tested through a clinical trial.

MATERIALS AND METHODS The presented data is a sub-analysis of a single center trial comparing the variation of leg volumes at two different heights in patients suffering from superficial venous disorders with oedema, measured with two different methods, water displacement and bioimpedance. Patients uderwent a phlebological consultation and oedema was diagnosed when sub-cutaneous anechoic bands were detected using ultrasounds. Exclusion criteria were post thrombotic syndrome, sequelae of deep venous thrombosis or deep venous reflux, healed or active ulcer, hypodermatitis, lymphoedema, if compression was worn on a daily basis.
Leg volumes were measured in the morning then 6 hours later, using the water displacement method. Two plexiglass boxes were used: one with a height of 50 cm (22L) (PBH) and one with a height of 32 cm (14L) (PBS).
For statistics, alpha risk 5%, power 90%, per-protocol analysis, correlation and Student t-test for paired measurements were used. The number of needed patients was empirically estimated.

RESULTS 43 legs of 29 female patients were tested with no drop-out. 15 patients had unilateral oedema. Age was 58.3±1.9 (mean, SD), ranged 32-71 yo; BMI, 24.7±0.5 (19.1-29.2). 100% of legs were C1,3EPAS1-5PN,R, including 42% C2 and 5% C2,4a. 26% had positive pitting test. A saphenous reflux was present on 6 legs and 15 had a reflux on saphenous tributaries. The venous clinical severity score was ≤ 5 in 72% of patients (range 2-8). Mean lower leg volume at t0 was 327.2 ± 2.83 cL for PBH and 154.5±1.12 cL, for PBS. The difference t6-t0 was 0.49±0.31 cL for PBH ($P<0.0001$) and 0.23±0.13 cL, for PBS, ($P<0.0001$). The difference between (t6-t0 PBH) and (t6-t0 PBS) was 0.26±0.23 cL ($P<0.0001$) and a linear correlation was observed ($R=0.78$).

CONCLUSION An increase of lower leg volume was shown in all patients during the day. The leg volume increase was equally distributed in the area below knee to foot. Our results confirmed preliminary assumption, which might have an important impact on the compression treatment choice.

EP9 PATHOGENETIC EFFECTS OF MPFF IN THE TREATMENT OF VARICOSE VEINS

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AIM The study was aimed at evaluating the endotheliotropic effects of Micronized Purified Flavonoid Fraction (MPFF) in patients with varicose veins of the lower extremities (VVLE).

MATERIALS AND METHODS This was a 2-month, open-label, controlled study. A total of 100 adult male or female patients with VVLE of Clinical Etiological Anatomic Pathophysiologic (CEAP) class C1-C2 were allocated into two groups (each of 50 patients) with or without treatment with MPFF 1000 mg daily for 60 days, on top of compression therapy. All patients underwent clinical examination with the assessment of the disease severity using the CEAP classification and duplex ultrasound scanning (DUS) of the lower extremities. Complete blood count, as well as biochemical blood tests for the assessment of the functional state of endothelium (FSE), including nitric oxide (NO) metabolites, and malondialdehyde (MDA), were performed at baseline and after 1 and 2 months of MPFF treatment. Student t-tests for independent samples were used for between-group comparisons and paired Student t-tests were used for comparisons over time.

RESULTS The treatment groups were comparable at baseline on main parameters. The use of MPFF was associated with a reduction in the activity of lipid peroxidation and enzymes of the antioxidant system: after 2 months of treatment, the MDA levels decreased significantly in the MPFF group (from 1.220±0.190 μmol/L to 0.858±0.231 μmol/L, P=0.001), but increased in the group with only compression therapy (from 1.191±0.204 μmol/L to 1.138±0.175 μmol/L, P=0.003). In addition, after 2 months, the levels of NO metabolites were higher in patients who received MPFF on top of compression therapy than in the group with only compression therapy (51.646±11.757 μmol/L *vs.* 36.310±6.921 μmol/L, P=0.001). During the MPFF treatment, no complications or side effects were reported.

CONCLUSION The treatment with MPFF had a beneficial effect on the functional state of the endothelium in patients with VVLE of CEAP class C1-C2. Venoactive treatment was associated with a statistically significant increase in the production of NO metabolites and a decrease in the production of lipid peroxidation products.

EP10 USING D-DIMER TO RULE-OUT PROXIMAL DVT PATIENTS

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AIM Deep Vein Thrombosis (DVT) is a common condition leading to a huge burden on the health care system. A more proximal (iliofemoral or higher) localization of the thrombus increases the risk of developing post-thrombotic morbidity significantly. Complete compression ultrasonography (CCUS), venous angiography, CT-, or MRV-scanning are able to localize the thrombus, though it is not always available and would be more costly. Diagnosis of DVT is usually based on two-point compression ultrasonography, a technique that is not able to differentiate these high-risk thrombi from lower risk distal thrombi potentially depriving patients from appropriate treatment, such as thrombolysis. D-dimer level, as part of the standard diagnostic process, are used to indicate the pre-duplex probability for DVT. However, limited studies indicated that its absolute value varies with regard to the extent and localization of the thrombus. Therefore, absolute D-dimer level might be able to select those patients to whom extended imaging would be beneficial. This study aims to determine whether we could exclude more distally located thrombi using absolute D-dimer levels.

MATERIALS AND METHODS All consecutive patients referred to an independent diagnostic medical center who were suspected for having a DVT between September 2004 and August 2016 were eligible for this retrospective study. Standard diagnostic work-up for DVT was performed as well as CCUS. Patients with objectified DVT and assessment of D-dimer level were included and categorized according to the Lower Extremity Thrombolysis (LET)-classification. ANOVA test was used for comparing differences between groups. Cut-off values were determined using ROC-curves.

RESULTS A total of 3381 patients with suspected DVT above 18 years old were assessed of which 3090 (1971 female) underwent measurement of the D-dimer level. Subsequently, 441 were diagnosed DVT using CCUS: 114 (26%) with LET I, 247 (56%) with LET II, and 80 (18%) with LET III, respectively. The mean D-dimer level was significantly higher in the LET III group (5,390±6,097 ng/mL) compared to the LET I (2,269±2,993 ng/mL, P<0.001) and LET II group (3,913±3,448 ng/mL, P=0.012). The D-dimer cut-off of<1300 ng/mL has a sensitivity of 91% and negative predictive value of 93% irrespective of clinical score to exclude LET III patients among all DVT patients.

CONCLUSION D-dimer level below 1300 ng/mL could be used to rule-out LET III patients in patients with an objectified DVT.

EP11 PREDICTING HAEMODYNAMIC SUCCESS PRIOR TO SAPHENOUS ABLATION WITH CONCURRENT APG AND PPG ON A TILT-TABLE

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AIM Air-plethysmography (APG) and photo-plethysmography (PPG) are functional tests quantifying venous insufficiency, and have been shown to be responsive to reflux ablation. The rate of calf expansion on a dependency manoeuvre is measured with APG in mL/s, the venous filling index (VFI). The venous filling time (VFT) after calf pumping sitting is measured with PPG in seconds. The PPG test can be modified using elevation emptying and dependent filling so both tests can be performed simultaneously, compared and standardised on a manually operated tilt-table.
Tha aim is to investigate whether the haemodynamic effects of saphenous occlusion can be predicted prior to endo-venous laser ablation (EVLA).

MATERIALS AND METHODS The legs (N.=17) of 12 patients, median [interquartile range] age (61[42-72]) years, BMI (26.4[23.8-32.1]) were tested with concurrent APG and PPG: (i) preoperative, (ii) predicted with ultrasound saphenous thigh occlusion, (iii) actual after a short EVLA of the groin segment of great saphenous vein. Clinical CEAP was: C2=2; C3=4; C4a=10; C6=1. The tilt-table manoeuvre was from standing at -70 degrees to 40 degrees Trendelenburg lasting 3 seconds. The median follow-up was 73[30-89] days.

RESULTS In 2 legs the saphenous vein recannalised and the leg ulcer healed in another. The venous clinical severity score was not statistically different before (5[4-6]) *versus* after EVLA (5[4-9]), P=0.153, Wilcoxon, especially due to the wearing of stockings daily after the procedure. However, both the APG-VFI and the PPG-VFT filling time sitting did improve: APG-VFI (pre 3[2.4-4.4] vs post 1.4[1.1-1.9], P=0.001) and PPG-VFT (pre 8 [3-21] *vs.* post 24 [15-30], P=0.02). Using the VFT parameter (seconds) for both APG and PPG on the tilt-table, the predicted im-

Figure 1. Predicted and actual post-op values using APG and PPG on a tilt-table.

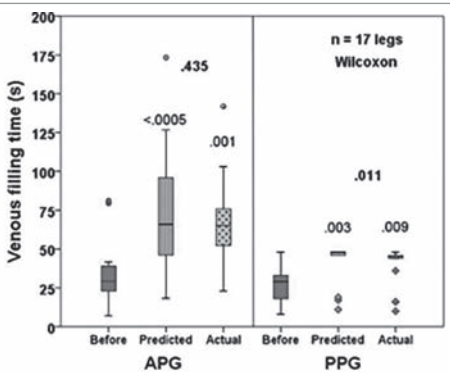
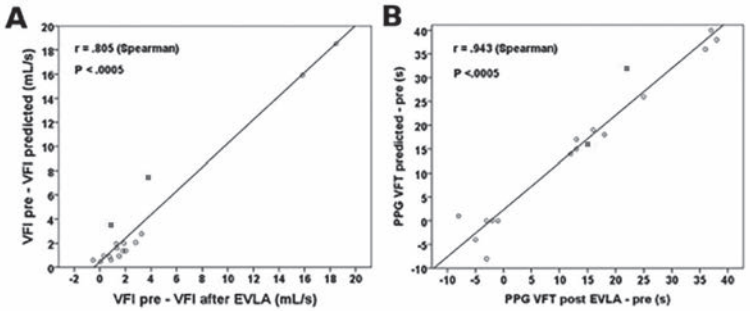


Figure 2. Correlations between predicted versus post-op responsiveness of (A) APG and (B) PPG on a tilt-table. Values above zero indicate improvement. The 2 squares represent recannalised veins.



provement and actual improvement were greater than the preoperative values (Figure 1). However, there was no statistical difference using APG only between the predicted and actual values (P=0.435). Furthermore, correlations between predicted and actual post improvements in both APG and PPG on tilt table were excellent (Figure 2). Comparing both tests, APG identified the 2 failures with almost universal improvements in the VFI. With PPG 6 legs deteriorated despite a successful saphenous ablation.

CONCLUSION The haemodynamic effects of a proximal saphenous EVLA without phlebectomies can be predicted with accuracy using probe occlusion and APG on a tilt table. Predicting the amount of haemodynamic improvement before the ablation may be useful in clinical cases when the decision to ablate is controversial.

EP12 INFERIOR VENA CAVA FILTERS IN VTE PATIENTS: UTILIZATION IN TERTIARY CLINICAL CENTER

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AIM Inferior vena cava filters (IVCF) are widely used as a tool for pulmonary embolism (PE) prevention despite the lack of scientific evidences that they provide a patient benefit. In our clinic, which is a large tertiary hospital, for IVCF placement we use indications postulated in the guidelines of Society of Interventional Radiology (2016). The aim of the present study was to retrospectively analyze the utilization of IVC filters placement in recent years.

MATERIALS AND METHODS The database of patients with VTE hospitalized in the large tertiary clinic in 2016-2017 was analyzed.

RESULTS There were 2399 (48.9% men, 51.1% women, ages 62.4±15.2) patients with VTE hospitalized in 2016-2017 (1148 and 1251 resp.). 1797 (74.9%) patients had deep venous thrombosis with no PE. 602 (25.1%) had PE with or without concomitant deep venous thrombosis. IVCF were inserted in 442 patients (18,4%), of them 116 had PE at admission. 437 (98,8%) filters were retrievable.
Among patients with no IVCF inserted one patient died of massive PE. Of 442 patients with IVC filters five died (1.1%). No PE, primary or recurrent, was registered in IVCF cohort.
On duplex ultrasound before discharge, occlusion of IVCF was found in 104 (23.5%) cases. In 68 (15.4%) patients occlusion might be considered as embolic but not as thrombus progression. No IVCF was retrieved during hospital stay. Only 29 (6.6%) filters were removed later.

CONCLUSION In a tertiary clinical setting IVCF were utilized actively in a recent years. IVCF occlusion rate was high, but in many cases it might be explained not by thrombus progression but by its fragmentation and migration from below. Nearly all the IVCF inserted were retrievable. Nonetheless, the removal rate was very low.

EP13 ENDOVENOUS THERMAL ABLATION OF GREAT SAPHENOUS VEIN PERFORMED USING TUMESCENT LOCAL ANESTHESIA WITH MINIMAL ANESTHETIC DOSE

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AIM Endovenous radiofrequency ablation (ERFA) of great saphenous vein (GSV) usually performed with tumescent local anesthesia (TLA) is the preferred method for varicose veins treatment. The aim: analysis of operative and postoperative results of ERFA using TLA with minimal anesthetic dose, evaluation of this technique for improving perioperative patient comfort.

MATERIALS AND METHODS We analyzed the results of ERFA in 137 patients (a total of 231 extremities) with lower limbs varicose disease (C2-C6), among them 37(27%) males and 100(73%) females. C2-5(2.1%), C3-57(24.7%), C4-152(65.8%), C5-8(3.5%), C6-9(3.9%) of legs. Coronary heart disease was noted in 7(5.1%), arterial hypertension-35(25.5%), diabetes mellitus-12(8.7%), obesity-21(15.3%), arrhythmias-29(21.2%) patients. A total 231 of limbs had ERFA of GSV and synchronous crossectomy in 34 limbs. TLA was used in 100% procedures, in 26.3%-with combined using of spinal anesthesia. In all cases, ERFA of GSV was supplemented with intra- and postoperative foam sclerotherapy under Doppler ultrasound control. The venous status was evaluated by objective examination and duplex angioscanning.

RESULTS 231 incompetent GSVs were treated by ERFA with a cold saline tumescent solution (0.9% at 50C) with local anesthetic drugs (mean total TLA volume per patient, when treating GSV alone, was lidocaine 80 mg: 800 mL for bilateral and 40 mg: 400 mL for unilateral treatment with epinephrine 1 mg: 1000 mL) and sedation (midazolam, diazepam). On average, a standard 10-12 mL/cm of TLA was used for saphenous trunks. No tumescent local anesthesia-related complications occurred. No patient has had pain during the procedure and in postoperative period (pain scores on visual analogue scale).

CONCLUSION This report of 231 (137 patients) endovenous procedures demonstrates safe performance of radiofrequency treatments using TLA with minimal anesthetic dose. A mean tumescent local anesthesia volume of 10-12 mL/cm administered to the perivenous space provides adequate anesthesia for truncal saphenous ablation. We consider, that ERFA with a cold saline tumescent solution (0.9% at 50C) using minimal local anesthetic (lidocaine – 0.1% with epinephrine 1:1000000) eliminates the risk of anesthetic overdose to avoid lidocaine toxicity and development of cardiovascular disorders, especially in patients with various forms of arrhythmias and improve the patient comfort. Due to extremely low concentrations of anesthetic, TLA is safe even with the introduction of large volumes of solution, which makes it possible to perform operations simultaneously on two limbs without use of general or regional (femoral nerve block, spinal, or epidural) anesthesia with effective and adequate reduction of perioperative pain level.

EP14 FIRST EXPERIENCE OF USING "SWIFT" RADIAL FIBRES FOR ENDOVENOUS LASER ABLATION - A PREMARKETING STUDY

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AIM Endovenous laser ablation (EVLA) is one of the treatment options for lower limb varicose veins. Recent development of newer optical fibres requires clinical studies to explore the technical aspects of their use and to define the optimal energy parameters in EVLA.
The aim is to evaluate the effectiveness, safety and technical aspects of EVLA with "Swift" radial optical fibres in the treatment of lower limb varicose veins.

MATERIALS AND METHODS A prospective single-centre study was carried out. A total of 110 procedures of EVLA in the superficial venous system (great saphenous vein, small saphenous vein, accessory saphenous veins, perforating veins) were included in study. A new type of radial optical fibre ELVeS-radial-swift ™ (Biolitec AG) on a 1470 nm wavelength diode laser was used. Selecting this type of fibre, the ablation energy parameters and the fibre extraction method were left at the operator's discretion. The technical features of the "Swift" optical fibre are: radial emission of laser radiation, 400 microns radial fibre diameter, 1.5 mm scattering tip diameter. Vein puncture was performed with a 14 G catheter, without using an introducer. The physical condition of the fibre was visually evaluated after each EVLA. The clinical outcome was assessed with physical examination and duplex scan on days 1-4 and then 30 days post intervention.

RESULTS All procedures were acutely successful and obliteration rate was with 100% in short-term follow-up. Mean power was 6.1±0.61 (4.7-9) W, with average energy of 2873±1671 J per EVLA procedure. In 9 patients, EVLA was simultaneously performed in multiple venous trunks (3-4 subcutaneous veins) using a single fibre, with average total energy of 8810±1202 J. The mean diameter of the subcutaneous veins was 8.9 mm (5-20 mm). No cases of fibre fragmentation or disintegration were observed. In 2 (1.8%) cases, carbonization of the fibre glass tip was seen after prolonged ablation in a post-thrombotic veins with 7 and 8 W power, and 210 J /cm and 161 J/cm LEED, respectively.

CONCLUSION EVLA with "Swift" radial fibres is safe and effective option for treating lower limb varicose veins. It does not require a use of introducer, which simplifies the procedure with potential cost benefit. This is the first publication describing the clinical use of these fibres.

EP15 SULODEXIDE AS ADJUVANT TO ANTICOAGULANT TREATMENT ON PATIENTS WITH LOWER EXTREMITY DEEP VEIN THROMBOSIS

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AIM Sulodexide represents a novel antithrombotic agent with multiple sites of action on blood coagulation and on vascular processes. Sulodexide has been suggested as an antithrombotic and anticoagulant agent, also the anti-inflammatory effect is well known as it is an agent that helps to repair the damaged glycocalyx. Recent data suggest deep venous thromboembolism is part of a pro inflammatory vascular condition. During the venous thromboembolism process great damage is done to the endothelial layer of the vein. The glycocalyx is seriously damaged during this inflammatory process. Sulodexide is a potent endothelial anti-inflammatory agent and a promoter of the glycocalyx recovery. The concomitant use of sulodexide and one of the new oral anticoagulants, rivaroxaban during the acute phase of venous thromboembolism should accelerate the natural process of recovery of the deep vein thrombosis process.

MATERIALS AND METHODS We made a study comparing two small groups of patients, 53 patients were included on the study. All patients had femoral, popliteal or below the knee deep vein thrombosis confirmed by compression ultrasound. 30 patients received conventional treatment with Rivaroxaban 15 mg BID for the first 30 days plus 20 mmHg compression, the other group of 33 patients received same treatment plus Sulodexide 250 LRU BID for the first 30 days. Control ultrasound performed at 10, 20 and 30 days to all patients to evaluate progress of the thrombus process. We also measured circumference of the affected leg on 3 points at 10, 20, and 30 days, and QOL was measured thru CIVIQ-20 questionnaire.

RESULTS Both groups matched age, sex, and site of DVT. The group that received Sulodexide significantly reduced leg circumference at 20 days average of 1.8 cm above the control group, venous ultrasound was similar on both groups and CIVIQ-20 questionnaire was significantly better on the Sulodexide group 89 points pretreatment and 46 points at 20 days versus 90 points pretreatment and 59 points at 20 days on the Rivaroxaban group.

CONCLUSION Sulodexide is an agent that has multiple antithrombotic and anticoagulant actions, as well as anti-inflammatory and reparative effects on venous endothelium and endothelial glycocalyx. This agent might accelerate the thrombolytic process after the acute period of DVT. Sulodexide seems to be a secure co adjuvant to new oral anticoagulants accelerating the recovery process of the patients with this problem.

EP16 HIGH RESOLUTION ULTRASOUND REVEALS SIX STAGES OF STASIS-INDUCED VEIN VALVE DAMAGE

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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 motion-resistant particle aggregations within valve sinus which are neither sludge nor thrombus, called motion-resistant aggregates (MRA). This consecutive prospective study compares valve structures, cusp motility and extent of aggregates, resulting in a new approach to vein damage classification.

MATERIALS AND METHODS In 500 consecutive patients (322 f, 178 m; 24 - 68 yr/o, GSV, SSV; C0-C6) presenting with unilateral epifascial venous insufficiency>C2, more than 6.800 saphenous vein valve locations were examined with high resolution ultrasound (14-23 MHz, peak up to 32 MHz, Vevo MD). Video recordings (manual 3-D scans) were collected for review and analysis by five experienced ultrasound investigators.

RESULTS Comparing repetitive patterns of valve formation, six different stages of valve changes were determined: 1) alteration of sinus hemodynamics, marked by reduction of flushed sinus volume, was the most frequent finding (59.4%); 2) restriction of cusp function due to aggregates but maintained valve closure was seen in 34.5% of the cases. Rare findings, correlating with short periods of occurrence, were 3) total fixation of cusps without reflux (3.1%), followed by stage 4 with initial onset of reflux (4.2%). Cases with increased reflux showed reduction of aggregates and progressive valve degeneration (5) and finally loss of valve structures.

CONCLUSION Motion-resistant blood cell aggregates at the valve sinus indicate successive stages of venous insufficiency, correlating with specific conditions of cusp motility, shape and flow. Knowledge of these consecutive stages provides a new basis to evaluate the effectivity of preventive measures, potentially effective in stages 1-4, and vein preserving strategies.

EP17 SURPRISE: HIGH INCIDENCE OF VEIN INSUFFICIENCY IN CHILDREN

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AIM Newer studies on the onset of intra- and epifascial venous disease show four major components: 1) congenital valve lesions, 2) stress-induced valve decompensation like seen in heavy workers or athletes, 3) stasis-induced inflammatory valve degeneration, and 4) usually secondary, phlebitis. As congenital vein valve damage is the first to occur in life, it should prepare a primary pattern of individual course of venous disease.

MATERIALS AND METHODS Using high frequency ultrasound systems (Siemens Juniper, Zonare One Pro, Mindray M9, 16 - 23 MHz; Vevo MD, 16-32 MHz), we examined 102 children and adolescents aged 6-18 (mean 12.5 years), 59 f, 43 m, all asymptomatic. Investigation time was limited to 15 minutes. In case of visible vein changes (protruding, more intense color, increased diameter), ultrasound started here. Otherwise, systematic screening of saphenous veins and typical perforator locations was performed.

RESULTS 71/102 children (58.8%), resp. 60/204 legs (34.8%) showed relevant venous pathology. Lesions were mainly located in the GSV: 60/204 (29.4%), versus primary saphenous side branch varices (3.9%), SSV (3.4%), and perforator veins (1.0%). GSV at the lower leg was related to 61.0% of all lesions. In the subgroup of 6-8 y/o kids, 11/23 (47.8%) already showed relevant pathology. 42.3% of all cases were related to a single valve failure. Among these, unilateral commissural mismatch was the most frequent pattern (70.0%). There was no gender predisposition.

CONCLUSION The unexpected high incidence of detected valve lesions in children, in particular in the younger ones, should be best explained by congenital disease. It is a merit of today´s ultrasound systems that even small lesions now can be detected. Not all of them will become symptomatic. Now the challenge is to learn which candidates at which age might have a preventive benefit from early detection, coaching and eventually a cost-effective therapy.

EP18 EVOLUTION OF QUALITY OF LIFE IN OUTPATIENTS WITH CHRONIC VENOUS DISEASE SEEN BY GENERAL PRACTITIONERS: RESULTS FROM THE ALIADO PROGRAM IN COLOMBIA

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AIM Improvement of health-related Quality-of-Life (QoL) is the main therapeutic goal in chronic disease, and QoL can be measured easily in Chronic Venous Disease (CVD). We present the evolution of the QoL in Colombian outpatients with CVD, included in the ALIADO program, seen by general practitioners in their day to day clinical practice.

MATERIALS AND METHODS ALIADO is a national, observational, prospective, multicenter survey that was implemented in Colombia. CVD patients ≥18 years, whatever the clinical, etiological, anatomic, pathophysiologic (CEAP) classification, consulting their General Practitioners, were enrolled in the study. Patient's clinical data, including QoL measured by CIVIQ-14 and CVD symptoms assessed by visual analogue scale (VAS), were recorded at inclusion and at a follow-up visit.

RESULTS 926 patients were included by 42 General Practitioners. The mean ± SD age was 59±14.2 years and 79% of the patients were female. At inclusion 4% of patients were in CEAP class C0, 15% in CEAP 1, 24% in CEAP 2, 28% in CEAP 3, and 30% of patients were in CEAP ≥4. 97% of patients were prescribed Micronized Purified Flavonoid Fraction (MPFF), 77% received lifestyle advices, compression therapy was prescribed in 33.6% of the patients.
After a mean follow-up of 87 days, symptoms decreased significantly: in average, heaviness by -58%, pain by -59%, sensation of swelling by -56% and cramps by -55% (all P values *vs.* inclusion<0,005). There was a parallel improvement in QoL evaluated by CIVIQ and the Global Index Score increased from 52 to 81, +55% (P<0.005).

CONCLUSION In Colombian day to day clinical practice, QoL and symptoms are improved in CVD patients when a comprehensive treatment is initiated. This comprehensive treatment included MPFF, lifestyle modifications and, in some patients, compression therapy.

EP19 CHIVA-LASER: OFFICE-BASED AMBULATORY HEMODYNAMIC PROCEDURE FOR CONSERVATIVE TREATMENT OF VARICOSE VEINS.

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AIM The CHIVA strategy is based on hemodynamic shunt definition with duplex ultrasound and classically consists of office-based surgical disconnection of the escape point (SFJ/SPJ) and/or the varicose branch(es) in local anesthesia. Our aim was to study the efficacy of short-segment endoluminal laser closure of SFJ/SPJ instead of surgical ligation in combination with surgical disconnection of the branches if needed.

MATERIALS AND METHODS 117 patients were evaluated before and 3-6-12 months after the ambulatory treatment of GSV/SSV truncal varicosity with CHIVA strategy using endoluminal double ring radial laser (Biolitec-Leonardo) for SFJ/SPJ short segment closure instead of surgical incision and ligation. The thermal endovenous closure was done in the near proximity of the superficial epigastric vein which was left open as washing vessel. In 70% of the patients a later additional cosmetic sclerotherapy was performed for distal remnant varicose or reticular veins. General data (age, gender), clinical (VCSS score, C classes) and ultrasound parameters (average diameter of GSV taken from 3 points, residual reflux at the groin and thrombophlebitis of GSV/SSV) were recorded and compared.

RESULTS The mean age was 51 years and 62,4% were women. The GSV was involved in the vast majority of the cases. 89,6% were in advanced clinical stages (C3-C6, C=3,9 and VCSS=9.2 on average). In 67,5% the duplex defined shunt type was 1+2 needing laser crossotomy and branch disconnection. The average length treated with laser from the junction was 11.4 mm. The applied mean energy was 1974.5 J/12.5W. The mean follow-up period was 9.8 months. The GSV diameter reduction was significant (from an average of 8.5 mm to 3.8 mm). There was also a significant clinical improvement after 3-12 months (C stage reduction from 3.9 to 2.1 and VCSS from 9.2 to 4.3). We found a 100% ulcer healing rate in C6 stages. Truncal GSV thrombophlebitis below the laser closure level was found in 16% with complete resolution after 3-6 months in the vast majority of the cases. Residual reflux at the groin was present in 7.6% without clinical signs of recurrence compared with 26.7% in our CHIVA classic series. ($P<0.0005$).

CONCLUSION The results of classic CHIVA strategy could be significantly improved applying endoluminal double ring radial laser closure of the escape point at SFJ/SPJ together with a short segment closure of GSV/SSV below. CHIVA-laser procedure seems to be a safe, efficient, ambulatory method for truncal varicose vein treatment with preservation of GSV, shorter intervention time, simpler to perform, less groin residual reflux and better tolerated compared to classical surgical methods.

EP20 CATHETER-DIRECTED FOAM SCLEROTHERAPY VS. ENDOVENOUS LASER ABLATION: ONE-YEAR FOLLOW-UP PROSPECTIVE STUDY

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AIM To compare the results of catheter-directed foam sclerotherapy (CDFS) under ultrasound guidance and endovenous laser ablation (EVLA) in case of elimination of reflux in the GSV of small diameter.

MATERIALS AND METHODS A prospective study of two groups of patients (N.=40) with varicose disease and GSV incompetence, CEAP clinical class 2-3. Reflux spread along the GSV from SFJ to just below the knee.
Group 1 (CDFS): N.=20 patients. The diameter of the GSV (3 cm below the SFJ) ranged from 3.5 mm to 5.1 mm.
The procedure was performed using tumescent anesthesia (or tumescence with physiological saline) with a catheter 6Fc 60 cm long, and 3% STS foam (1:4). On average, up to 10 cm3 of foam was injected into the GSV.
Group 2 (EVLA): N.=20 patients. The diameter of the GSV ranged from 3.5 mm to 5.5 mm.
The procedure was performed in outpatient settings using tumescent anesthesia. A 12 W IRE-POLUS device with a wavelength of 1,560 nm was used. The optical fiber is 600 μm with a radial scattering pattern. The patients were examined with duplex imaging 7-14 days, 6 months and 1 year after surgery.
Statistical analysis was performed using MedCalc software.

RESULTS
After 7-14 days. In group 1, GSV was obliterated in 19 patients (95%). In 1 case (5%), the absence of obliteration of the GSV trunk from SFJ to the middle third of the thigh was recorded. The patient is excluded from the study; he underwent EVLA. In group 2, 100% of patients had GSV occlusion.
After 6 months. In group 1, the trunk occlusion occurred in 15 out of 19 patients (78.9%). In 1 case, the pathological stump of GSV was found, in 3 cases there was partial recanalisation of the GSV. In group 2, GSV was occluded in 100% of cases.
After 1 year. In group 1, there was no dynamics in three trunks after recanalisation. One patient in the GSV stump had reflux. In group 2, 17 patients were examined, GSV was obliterated in all cases.

CONCLUSION A comparative study emphasized the EVLA priorities. However, it is possible to perform CDFS with a GSV diameter less than 4.5 mm and in the absence of large tributaries on the thigh. The advantages of the method are its technical simplicity, the possibility to perform it without local anesthesia, almost complete absence of pain, the rapid recovery of activity and the economic benefit for the patient.

EP21 IMPLEMENTATION OF NEW ENDOVENOUS TREATMENTS OF VARICOSIS IN THE THERAPY OF VENOUS MALFORMATIONS

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AIM In the context of venous malformations we often see a superficial vein of the lateral lower limb as a remnant of embryonic vessels that failed to regress. This so-called marginal vein is the most common venous malformation involved to the Klippel-Trenaunay syndrome. The vein consists of a large diameter and causes venous stasis and hypertension as a consequence of the absence of venous valves along its entire length. The extensive diameter of the vein impedes a successful treatment by sclerotherapy with polidocanol or alcohol. The surgical removal is considered technically challenging for potential severe blood loss due to the large perforators to the deep veins.
Here we show that endovenous treatments of varicosis (laserablation, cyanoacrylate adhesive) in the treatment of lateral embryonic veins might be a feasible treatment option.

MATERIALS AND METHODS In the case of a 31 year old woman with a lateral embryonic vein with a diameter of max. 1.4 cm treated unsuccessfully with recurrent alcohol injections we used a 1470nm diode laser. After accessing the distal aspect of the vein the laser was advanced over the complete subcutaneous length. Following instillation of tumescent anesthesia the vein was treated with laser energy at 10 Watt, delivering a total of 13900 J over a 76cm segment. An ultrasound control after 34 month revealed a complete closure of the treated vein segments.
In a 22 year old student with a marginal vein of the lower leg draining in to the distal femoral vein we used an 1470 nm diode laser with a radial fiber applying 66 J/cm. In the control 6 weeks after treatment ultrasound confirmed the occlusion of the vein.
Two patients, a 16 year old man and a 47 year old women with smaller, more tortuous embryonic veins and multiple subcutaneous small tributaries were treated with the medical adhesive n-butyl cyanoacrylate. In both patients a total amount of 9 ml cyanoacrylate was injected. The adhesive was applied through 18- or 20-G peripheral iv catheters. The ultrasound controls after 28 months showed the closure of the veins.

RESULTS In all cases we saw good results with complete occlusion of the marginal vein confirmed by ultrasound. In all patients a significant reduction of swelling and heaviness of the treated legs was achieved. No thrombosis or pulmonary embolism occurred.

CONCLUSION Endovenous laser ablation as well as the medical adhesive n-butyl cyanoacrylate are safe and effective in the treatment of lateral embryonic vein during short term follow-up.

EP22 NEW VENOUS HEMODINAMICAL AND ANATOMICAL PATTERNS FOR GREAT SAPHENOUS VEIN SPARING SURGERY

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AIM In more than 80% of Great saphenous vein reflux with Terminal valve incompetence, the great saphenous vein chemical or termical distruption or stripping can be avoided. The treatment of varicose veins is usually characterized by the suppression of the saphenous trunks, with or without crossectomy. Our group showed that also in surgery we can remove a saphenous trunk without crossectomy. In ordinary methods of treatment the reflux theory is from top to bottom, but we have seen in many years of phlebological activity that in most cases the reflux begins at mid leg. So the theory could be totally different, from bottom to top. The removal of the varicose tissue leaving the GSV has been published, with interesting results.

MATERIALS AND METHODS From a series of 7500 varicose legs examinated and operated for VV, 500 were chosen for GSVSS (Great Saphenous Vein Sapring Surgery presented). All legs presented Great saphenous vein reflux and terminal valve incompetence; they were mapped and digitally recorded and divided in three groups, depending on haemodynamical and anatomical features: Group A: presence of reentry Dodd or Boyd perforator; Group B: Hypoplasia of GSV; Group C: 4 draining collateral of the thigh with reentry perforator. In all patients the GSV was saved. During mapping, the diameter of GSV was recordered, The TV was examinated and the number and size of tight draining tributaries and perforators was noted.

RESULTS The analysis of the results has been based on clinical evidences and color duplex study after 1 and 3 years. The duplex analysis in the groups A,B,C take note of the residual Great saphenous vein with: a) diameter, b) presence of reflux c) presence of thrombus d) absence of reflux and draining flow. In 9% of cases the GSV was thrombosed, and the reentry perforator was very thin or non present. In 98% of cases the GSV diameter was reduced and in 8% of cases the GSV was still refluent but draining in a perforator, In 69% of cases the GSV was without reflux. In 98% of cases there was improvement in clinical status and no varices were present, In 2% of cases there were residual varices and worsening of previous status (due to acute thrombosis of the residual axis).

CONCLUSION More than 80% of Great saphenous vein reflux with terminal valve incompetence the GSV chemical or termical distruption or stripping can be avoided. This new point of view is interesting because of local anesthesia, no hospitalization, very low risk for patient and surgeon, with an excellent compliance.

EP23 DEEP VENOUS VALVULAR FUNCTION IN LOWER EXTREMITY VENOUS DRAINAGE

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AIM The aim is to assess the role of deep venous valvular function in lower extremity venous drainage.

METHODS The study involved 22 healthy volunteers without any signs of chronic venous diseases. Duplex ultrasound scanning (DUS) was performed in order to examine the function of the valve of the superficial femoral vein using the M-mode. Venous diameter, venous intercusp lumen reduction, and valve cycle were assessed.

RESULTS Active function of valves was recorded in 9 patients with a venous intercusp lumen reduction of 35.5% to 55.4% (mean 46.9%). Active function of valves was not registered in 7 subjects, while the degree of venous lumen reduction varied from 27% to 62.5% (average 45.9%). There was no statistical difference between the 2 groups (P>0.05); venous outflow at rest was strongly associated with "*vis a tergo*" factor. Patients with an actively functioning valve had the valve cycle strongly associated with the act of breathing, *i.e.* "*vis a fronte*" factor. To assess the effects of the cardiac cycle on the deep venous valvular function, we additionally enrolled six subjects who were admitted to the department of vascular surgery and underwent DUS with ECG synchronization. At admission, valvular function recorded in 5 out of 6 patients; the valve cycle was synchronized with breathing. Active function of deep venous valves was not registered in one subject. After 2 to 3 days of intravenous infusion therapy, active valvular function was recorded in all patients, and was strongly associated with breathing, while not synchronized with the ECG. To exclude the "*vis a fronte*" effects, the patients were asked to hold their breath: the valves closed strictly after the ventricular systole as monitored on the ECG. However, it was not an influence of the overall kinetic energy of blood movement during cardiac output, but its component - a potential energy of the deformation of the vascular wall. Such mechanism of the venous outflow may be described as an arterio-venous pump.

CONCLUSION Continuous work of the deep venous valves is not a prerequisite for venous outflow from the lower extremities. Active function of the valves is rather associated with a mechanical factor i.e. the volume of blood accumulated in the venous system.

EP24 THE EFFICACY AND SAFETY OF MICRONIZED PURIFIED FLAVONOID FRACTION IN THE TREATMENT OF VENOUS DISEASES IN GERONTOLOGICAL PATIENTS

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AIM The study was aimed at assessing the efficacy and safety of a treatment strategy including micronized purified flavonoid fraction (MPFF) in the treatment of gerontological patients with chronic venous disease (CVD) C4-C6 (CEAP) of the lower extremities.

MATERIALS AND METHODS This was a national observational study involving patients who consulted vascular surgeons for any clinical presentation related to CVD. Demographic characteristics, medical history and concomitant diseases were recorded. The patients underwent a clinical examination of the lower limbs to identify the CVD signs using the Clinical Etiological Anatomic Pathophysiologic (CEAP) classification. After a first visit, patients were asked to return for a follow-up visit after one month. We report here the management of the subgroup of patients with venous ulcers. Treatment strategy included ulcer debridement every 5-7 days, topical application of antiseptics and hydro-alginate dressings, and stimulation of reparative processes using MPFF 1000 mg daily. Laser Doppler flowmetry (LDF) was used for the study of microcirculatory blood flow.

RESULTS A total of 281 gerontological patients with CVD were enrolled, including 242 patients (86%) with primary vein-valve incompetence and 39 (14%) with post-thrombotic syndrome (PTS). Trophic disorders (CEAP classes C4-C6) were present in 132 patients, including venous ulcers in 40 patients. Among the 40 patients with ulcers, 28 had a history of coronary artery bypass and 19 patients had diabetes mellitus. After treatment strategy including 4-week treatment with MPFF 1000 mg daily there was an increase in the microcirculation index up to 16.9±2.1 perfusion units in 31 of 40 patients, suggesting an improvement in the lower limbs skin perfusion. No surgical interventions on the venous system were performed. Venous ulcers were completely epithelialized in 9 patients. Epithelialization of the ulcers was achieved in 17 patients, and wound defect decreased in 11 patients. The repeated cardiac evaluation revealed an improvement in the functional class of the chronic heart failure in 9 out of 17 patients with a healed venous ulcer. No adverse reactions to MPFF were reported, and no decompensation of comorbidities throughout the follow-up period was observed.

CONCLUSION The prescription of venoactive treatment (MPFF 1000 mg/day) as part of a treatment strategy including ulcer debridement, topical application of antiseptics and hydro-alginate dressing to gerontological patients with complicated forms of CVD (stage C5-C6), provides a safe and effective correction of trophic disorders and ulcer healing with the achievement of a positive clinical outcome.

EP25 EVOLUTION OF SYMPTOMS WITH ENDOVENOUS ABLATION OF VARICOSE VEINS IN OUTPATIENTS WITH CHRONIC VENOUS DISEASE: RESULTS OF THE ALIVIO PROGRAM IN COLOMBIA

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AIM Compared with stripping operations, endovenous ablation (EA) of varicose veins (VV) produces less postoperative pain and a shorter sick leave, and the different techniques can be used safely and effectively. We present here the evolution of symptoms and quality of life with EA of the patients included in the ALIVIO program.

MATERIALS AND METHODS ALIVIO was a national, observational, prospective, multicenter survey, implemented in adult Colombian symptomatic outpatients with Chronic Venous Disease (CVD) undergoing EA of VV performed by Vascular Surgeons (VS). Measurements at inclusion included evaluation of symptoms by a 10-cm visual analogue scale (VAS) and quality of life (Qol) by CIVIQ-14. After the procedure, patients were asked to return for a follow-up visit after at least on month. At the follow-up visit, the VS assessed symptoms by VAS, CIVIQ-14 and patient's expectations with a Darvall questionnaire. Z test for paired samples were used to compare mean values at baseline and at the follow-up visit.

RESULTS A total of 209 patients were enrolled by 12 VS; 74% were women and mean age (± SD) was 54 ± 13.4 years. In addition to the EA, 92% of the patients received Micronized Purified Flavonoid Fraction (MPFF), 81% compression therapy and 36% life style modifications. After a mean follow-up of 58.6±32.6 days, pain decreased by -50% (from 6.3±2.2 to 3.2±1.7 cm), swelling by -53% (from 5.7±2.5 to 2.7±1.7 cm) and cramps by -27% (5.1±2.5 to 3.7±2.5 cm) (all $P<0.005$). In terms of Qol, all the 14 items of the CIVIQ decreased significantly (all $P<0.05$) producing a parallel improvement in the Global Index Score that increased in average from 67 to 87 ($P<0.005$). In relation to the post procedure expectations, 82% of the patients reported that the treatments improved the leg appearance (varicose veins and telangiectasias) an awful/a lot or quite bit, 18% reported a little improvement of the appearance, 82% reported that the procedure allowed them to do their work better an awful/a lot or quite bit, 10% a little and 1% not at all.

CONCLUSION Regarding symptoms and Qol, the ALIVIO program in Colombia confirms that EA of VV, associated with MPFF and compression therapy in most patients, is efficient in reducing symptoms with a parallel improvement in quality of life. More efforts are needed to raise awareness about lifestyle changes in CVD to improve even more QoL.

EP26 INTRALUMINAL VENOUS STENTING FOR NON-THROMBOTICILIAC VEIN LESION (NIVL)-A SINGLE INSTITUTION EXPERIENCE

WenHsien Hsu
Taipei Medical University-WanFang Hospital, Taipei, Taiwan

AIM With advance of imaging techniques the diagnosis of non-thrombolic ilac vein lesion (NIVL) become more frequently recognized. The pathogenicity of iliac vein lesion varied but the pathophysiology is essentially the venous outflow obstruction (VOO) that causes venous hypertension manifesting with different clinical symptoms and signs, notably lower limb lymphedema (LLL) and chronic venous disease (CVD). The VOO is most commonly related to arterial compression at left iliocaval junction known as May-Thurner syndrome or other points of iliac vein where iliac artery cross over. Multiple venous compressions are frequently encountered in patient with tortuous iliac artery. Other pathogenicity of VOO is related to the iliac vein torsion secondary to vertebral degenerative disease or spondylolisthesis. This compression effect is progressive and may end up with substantial disabilities. The intraluminal stenting of pelvic vein was first described in 1988 as a single case report by a vascular physician of Zurich and further popularized in late 1990's in USA. For a decade we have adopted this procedure for NIVL manifested with LLL with or without CVD.

MATERIALS AND METHODS Between April 2008 and August 30 2017, 1050 consecutive patients (median age 55, range 14 to 86) with chronic LLL in 1198 limbs were retrospective reviewed to evaluate the efficacy of intraluminal treatment for LLL that related to venous pathology etiologically. The diagnosis was established by detailed history, clinical examination, non-invasive vascular test and vascular sonogram. Iliac venography with multi-detector computed tomography (MDCT) performed for verification of venous pathology. The demonstrated venous pathology includes radiographic evidence of occlusion, particularly at the iliocaval junction with development of venous collaterals, stricture and anatomical deformity of the iliac vein. Treatment included angioplastic balloon dilatation with placement of metallic stents in different configuration depending on the anatomy of the iliocaval confluence.

RESULTS Three types of stent configuration applied; unilateral iliac vein stenting 259/1050(24.6%) for simple left iliac vein compression, appositional bilateral iliac vein stenting 246/1050 (23.4%) for bilateral iliac vein compression and bilateral kissing stents as original procedure for iliocaval confluence with obtuse angle 386/1050 (36.7%). Totally 2048 stents deployed. Technical success rate 99.8%. Patency rate at 3 months, 6 months and 12months were 98.3%, 96.6% and 94.7% respectively. Clinical symptoms improved significantly in terms of pain, swelling and function. No surgical mortality reported. The morbidity was minimal.

CONCLUSION Phlebolymphedema of lower limb due to NIVL is ameliorable with intraluminal placement of metallic stents. The procedure is safe and effective. Long term follow-up is necessary to verify the value of this treatment modality.

EP27 RADIOFREQUENCY VERSUS 1470NM LASER ABLATION OF GREAT SAPHENOUS VEIN REFLUX: A SINGLE CENTER, RANDOMIZED CLINICAL STUDY

Christos Karathanos; Petroula Nana; Konstantinos Spanos; Konstantinos Batzalexis; Nikolaos Roussas; Athanasios Giannoukas
Department of Vascular Surgery, University Hospital of Larissa, Faculty of Medicine, University of Th, Larissa, Greece

AIM most of the studies have compared radiofrequency ablation (RFA) with old generation laser technology. Our aim was to compare the outcome of RFA and endovenous laser ablation (EVLA) with the new generation 1470nm laser for the the treatment of great saphenous vein (GSV) reflux.

MATERIALS AND METHODS Consecutive patients with GSV reflux were randomized to RFA (VNUS® ClosureFAST™) or EVLA with 1470 nm (radial - ELVes® or linear - VenaCure®) fiber at a single academic center. Clinical classification (CEAP), 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 at 7, 30 days and 1 year post-ablation including clinical examination and duplex scan. Primary outcome was anatomic success defined as absence of reflux or recanalization of GSV. Secondary outcomes were procedure related complications (thrombotic complications, ecchymosis, tederness), postoperative pain using the VAS scale and improvement of VCSS and CIVIQ scores.

RESULTS 135 patients were included in the study; 45 patients RFA (group I), 45 EVLA 1470 nm radial fiber (group II) and 45 EVLA 1479nm linear fiber (group III). Patients' demographics, CEAP classification, mean linear endovenous energy density, average vein diameter and length of ablated vein were comparable between the three groups. No major complications were observed post-operatively. Endothermal heat- induced thrombosis was observed in 2 patients in group I, 1 in group II and 2 in group III (4.4% *vs.* 2.2% *vs.* 4.4%, respectively $P>0.5$). Minor complications such as ecchymosis and tederness were similar in all groups at all visits. GSV occlusion rate at 12 months were 93% in group I, 93% in group II and 95% in group III ($P>0.5$). During follow up, all patients showed a significant improvement in all domains compared to postoperative assessment ($P<0.05$). VCSS was more improved in group II at 1 week ($P=0.02$). CIVIQ pain score was more improved in 1470 nm radial fiber patients at 7 and 30 days after treatment.

CONCLUSION Endothermal venous ablation using the RFA and 1470nm radial or linear fiber laser are equally effective and safe modalities for the treatment of GSV reflux. EVLA with the 1470nm radial fiber showed better outcomes in terms of early postoperative VCSS and pain CIVIQ scores. However, clinical and quality of life improvements were similar after 30 days in all groups during first post-operative year.

EP28 INFLUENCE OF CDT ON QUALITY OF LIFE OF PATIENTS WITH LOWER LIMB LYMPHEDEMA

Tatiana Apkhanova; Detelina Kulchitskaya
[1]*National Medical Research Center for Rehabilitation and Balneology, Ministry of Health of Russia, Moscow, Russia*

AIM The method of CDT, still remains the "gold" standard for the treatment of lymphedema of the lower extremities. Based on 10 years of experience CDT, we have established negative side effects of the CDT, which significantly reduce the QoL of patients with lymphedema, as well as their compliance to treatment.
The aim is to study the effect of the CDT on QoL of patients with lower limb lymphedema.

MATERIALS AND METHODS 40 patients with lymphedema of the lower extremities of I-III stages were randomly divided into the following groups: group 1 – 20 patients received CDT: MLD, skin care, short-stretch elastic Bandaging of limbs, physical exercises; 2nd group – 20 patients received standard elastic stockings of the 3rd compression class and oral flavonoid. The study of the QoL was carried out using the questionnaire CIVIQ-20. Duration of treatment was 3 weeks. In the 1st group receiving CDT, there was a decrease in malleolar volume by 9.79%. Reliable regression of edema in patients in the 2nd group was not noted. In the 1st group after treatment was observed a reliable positive dynamics of QoL: by a pain scale of 23.37%, by a physical scale of 21.01%, according to the social scale by 18.11%. The change in the QoL score on the psychological scale was unreliable. In patients of the 2nd group positive dynamics of QoL parameters was observed only on a psychological scale - by 19.06%. The majority of patients in the 1st group who received CDT had negative secondary effects of Bandaging: dryness, itching, skin irritation in the area of popliteal fossa and ankle. The patients also experienced psychological discomfort associated with the prolonged impact of the bandaging (23 hours a day), in which it was necessary to work, move and sleep, as well as aesthetic problems caused by the difficulty in choosing clothes and shoes. Absence of reliable clinical effect in patients of the 2nd group is apparently due to the fact that 3 weeks of taking oral flavonoid are not sufficient for the onset of significant clinical effect, and the standard elastic stockings of the 3rd compression class is ineffective for lymphedema II-III stages.

CONCLUSION The use of the CDT method in patients with lymphedema of the lower extremities is accompanied by the most pronounced decongestive effect, but is accompanied by psychological and physical discomfort, leading to a decrease in the QoL score on a psychological scale. To facilitate the "burden" of short-stretch elastic Bandage, new alternative methods of compression therapy for lymphedema can be used (Velcro and quilts devices).

EP29 RISK FACTORS FOR RECURRENT DEEP VENOUS THROMBOSIS

Raghid Kreidy[1], Benallal S[2]
[1] *Saint George Hospital, University Medical Center, Beirut, Lebanon*
[2] *Sidi Bel Abbas, University Medical Center, Sidi Bel Abbas, Algeria*

AIM Venous thromboembolism recurs in about 30% of cases. The aim of this study is to evaluate risk factors for recurrent deep venous thrombosis among Lebanese population.

MATERIALS AND METHODS Between January 2000 and January 2019, four hundred ninety four patients diagnosed with lower extremity deep venous thrombosis in a tertiary university hospital were retrospectively reviewed. One hundred twenty patients (24.2%) had recurrent venous thrombosis (Group I). Risk factors for venous thrombosis were reported in group I and compared to those observed in a control group including 120 patients with primary venous thrombosis (Group II). The two groups had similar characteristics for age, sex, hospitalization, localization and extension of the thrombosis. A statistical analysis using CHI 2 test, Log rank: P value and multivariate cox regression was done.

RESULTS The most significant risk factors were the presence of more than 3 major risk factors (P<0.0003, odd ratio: 2.74, IC (95%): 1.58-4.76) and the presence of genetic mutation (P<0.002, odd ratio: 2.44, IC (95%): 1.35-4.39). The presence of inferior vena cava malformations (P=0.063), history of inherited thrombophilia (P=0.215), heart failure (P=0.22), homozygote mutation for factor V - Leiden (P=0.279) and for MTHFR C 677 T (P=0.365), increased plasmatic homocysteine level (P=0.381) and heterozygote mutation for factor II (P=0.48) did not reach statistically significant level.

CONCLUSION Inferior vena cava malformations, often associated with inherited thrombophilia, increases recurrent thrombosis. Patients with multiple risk factors and/or carriers for pro-thrombotic genetic polymorphisms are at a higher and significant risk for recurrent venous thrombosis. These patients require more active preventive measures in high risk conditions and long term extension of anti-coagulant treatment after the first episode of venous thrombosis.

EP30 ENDOVENOUS LASER, SCLEROTHERAPY AND VEIN GLUING COMBINED AS A SINGLE CATHETER PROCEDURE FOR SAPHENOUS VEINS. INITIAL EXPERIENCE.

Valeriia Volkovaia; Sebastian Kreis; Chris Ragg
Angioclinic Vein Center, Zurich, Switzerland

AIM Gluing of veins is discussed as being superior to thermo-occlusive methods or sclerotherapy as it may achieve immediate and permanent vein closure. Furthermore, no tumescent anesthesia is required. However, current gluing device (VenaSeal, VariClose, VenaBlock) require continuous placement of aggressive N-butyl-cyanoacrylate (NBCA) to induce a vein spasm, which is mandatory for an effective displacement of blood. Inflammatory discomfort due to NBCA or to residual blood resorption is frequently observed. The NBCA glue is hardly resorbable, it is a long-term plastic implant. For safety reasons the junction is generously spared, thus SFJ branch relapse (mainly AAGSV) is increased. Segmental glue application is preferred by some investigators, leaving native endothelium and thus another source of relapse. All these drawbacks could be overcome by a new modality which combines endovenous laser for the junction, followed by segmental or pointwise gluing and catheter sclerotherapy.

MATERIALS AND METHODS 26 patients (19 f, 8 m, 41-72 yr) with GSV insufficiency and diameters of 8-22 mm Ø (mean: 9.0 mm), length 39-62 cm (mean 52.1 cm) underwent endovenous laser (1470 nm, radial, slim fiber) for an 8 cm long junction segment ("laser crossectomy"), followed by a Scleroglue® prototype procedure, comprising sclerotherapy (Aethoxysklerol 1%, 1+4 with air) and NBCA spot gluing, using a single coaxial catheter access. No external compression media were used post treatment except a film bandage for superficial varicosities. Follow-up was performed next day and 2-6-12 months.

RESULTS All cases (26/22) showed immediate saphenous occlusion and reflux elimination. Day one examinations showed the saphenofemoral junction closed without any stump (26/26). Procedural time from first puncture to access closure was 9:30-15:30 min. (mean: 11:35 min). No patient reported intra- or postprocedural discomfort. At one-year follow-up, all cases showed total occlusion, including the junction. Sclerofoam segments showed 45% more diameter regression compared to the glue spots.

CONCLUSION Combining laser crossectomy and ScleroGlue®, optimal morphological and functional results were obtained in this small initial experience. Patient comfort was considerably good, compared to the experience with single laser, sclerofoam or glue procedures. Now the challenge is on the manufacturers to provide a cost-effective (*e.g.*<500 USD) device.

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MEDICAL AND TECHNICAL EXHIBITION

A trade exhibition of medical and pharmaceutical products will be staged in the Exhibit Area (Lichthof Nord, Sud and Foyer West KOL-D-43a, situated in the lower ground level.
(Please see exhibition plan on page 74)

ACKNOWLEDGEMENTS

The organisers of the meeting would like to thank the sponsors and exhibitors for their generous support of the meeting.

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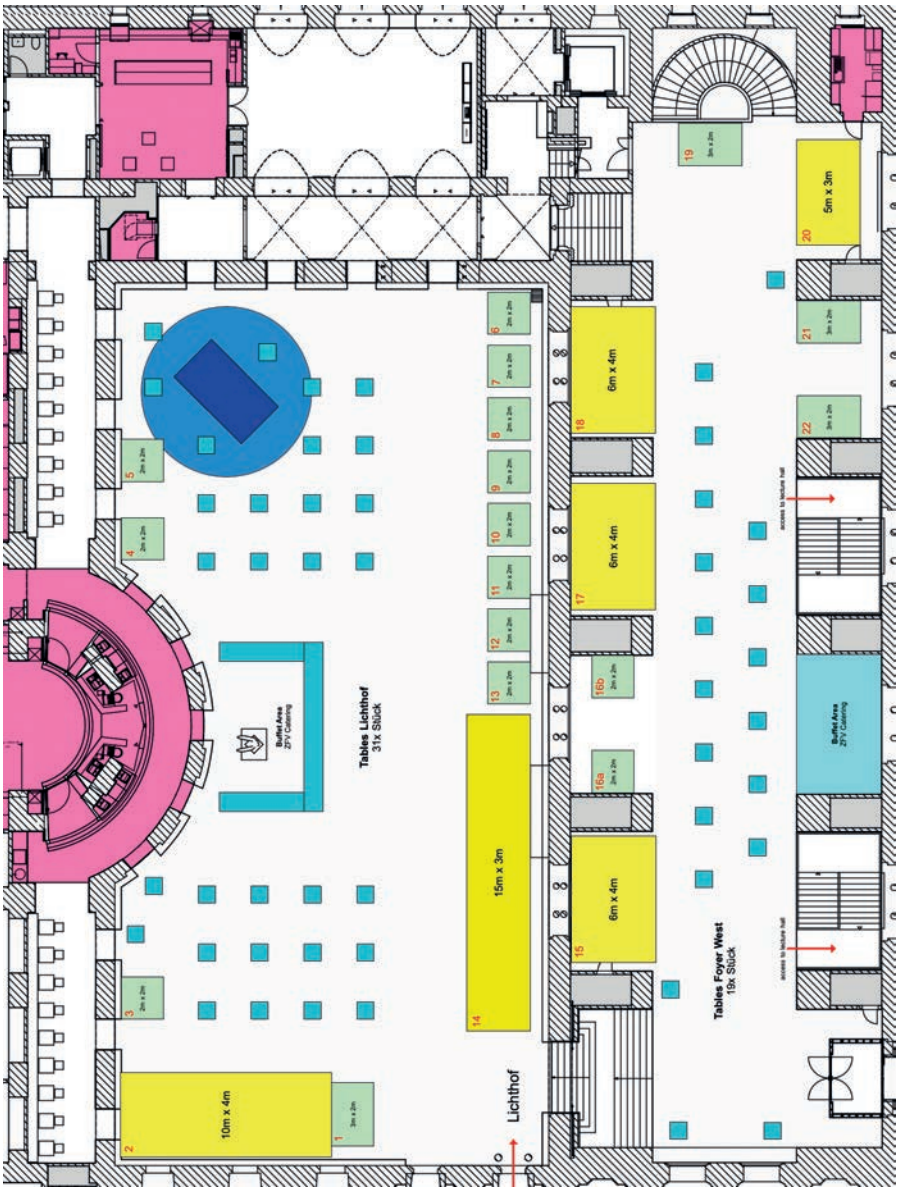
The EVF would like to thank the Swiss Society of Phlebology for their support of the meeting and the congress dinner.

EXHIBITION PLAN



Stand	Dimensions	Company
1	2 x 3m	Cardinal Health
2	10 x 4m	SIGVARIS Management AG
3	2 x 2m	STD Pharmaceutical Products Ltd
4	2 x 2m	VENARTIS
5	2 x 2m	Venous News/Charing Cross
6 + 7	4 x 2m	VENOSAN
8	2 x 2m	Philips
9	2 x 2m	EVF Stand
10 + 11	4 x 2m	OM Pharma Switzerland
12 + 13	4 x 2m	Bauerfeind AG
14	15 x 3m	SERVIER
15	6 x 4m	Medtronic
16a	2 x 2m	Cook Medical
16b	2 x 2m	Kreussler Pharma
17	6 x 4m	ALFASIGMA S.p.A
18	6 x 4m	Medi GmbH & Co. KG
19	2 x 3m	Pierre Fabre
20	5 x 3m	Biolitec biomedical technology GmbH
21	2 x 2m	EVF Stand
22	2 x 2m	LSO Medical

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Models for illustration purpose – not actual patients

1. Abbreviated Summary of Product Characteristics (Doxium® Switzerland)

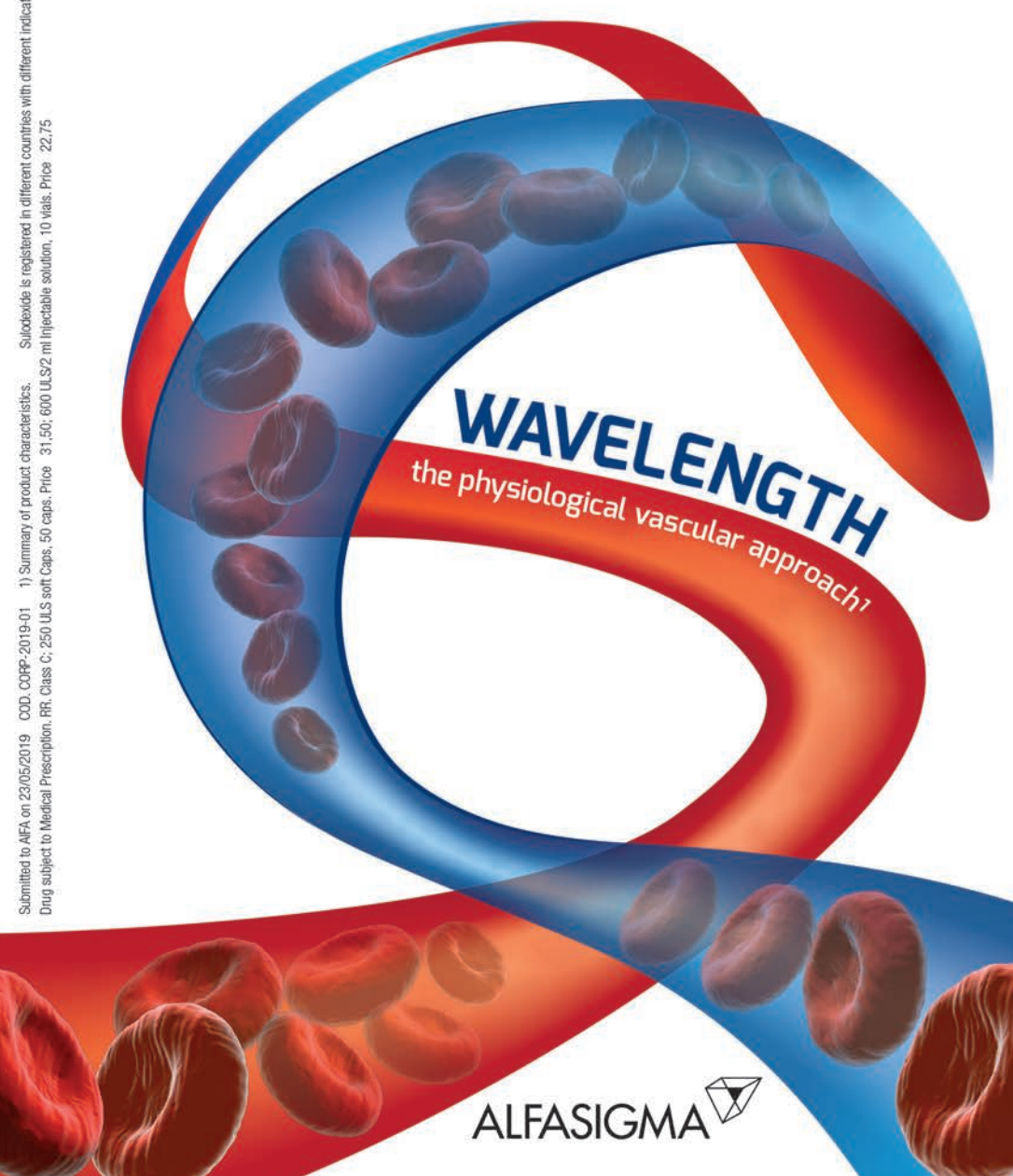
C2 Calcium dobesilate monohydrate. 500 mg capsules. **I1** Microangiopathies, in particular diabetic retinopathy, clinical manifestations of chronic venous insufficiency of the lower limbs, superficial thrombophlebitis as an adjuvant, haemorrhoidal syndrome, post-thrombotic syndrome, microcirculatory disorders of arteriovenous origin. **D1** For adults only. 500 mg to 2000 mg of calcium dobesilate monohydrate daily to be taken during or after meals; generally for a few weeks to several months depending on disease. The dose may be reduced for the administration of Doxium to patients with kidney failure, in particular with the ones requiring dialysis. The safety and efficacy of calcium dobesilate have not been established in patients with liver failure. It is recommended that the benefit of the treatment be reassessed in the event of a significant increase in liver values. No trials have been conducted to study the use of calcium dobesilate in children. **CI1** Hypersensitivity to calcium dobesilate monohydrate or to any of the excipients. **Pr1** Pregnancy, breastfeeding. Data on the use of calcium dobesilate in pregnant women is limited, animal studies do not indicate direct or indirect harmful effects with respect to reproductive toxicity, the medication should not be administered during pregnancy unless absolute necessary. Calcium dobesilate monohydrate enters the maternal milk in very small quantities, as a precaution, either the treatment or the breastfeeding should be stopped. **W&P1** In case of renal insufficiency, a dose reduction may be required since the drug is excreted by the urinary route. In very rare cases, administration of calcium dobesilate monohydrate may induce agranulocytosis, probably as part of a hypersensitivity reaction; symptoms may include high fever, infections of the oral cavity (tonsillitis), sore throat, anogenital inflammation and other symptoms that are common signs of infection. Blood formula and leukogram must be performed and the medication must be withdrawn immediately. In the event of a hypersensitivity reaction, treatment must be stopped. **AE1** Common (≥1/100 to <1/10): Abdominal pain, nausea, diarrhoea, vomiting, headaches, joint pain, muscle pain. Uncommon (≥1/1,000 to <1/100): Fever, shivering, sensation of weakness, fatigue, hypersensitivity. Very rare (≥1/10,000) or frequency unknown: anaphylactic reaction, neutropenia, leukocytopenia, agranulocytosis. These reactions are generally reversible once treatment is stopped. In case of gastrointestinal disorders, dosage should be reduced or treatment temporarily withdrawn, in case of skin reactions, fever or change in blood formula, treatment must be stopped (possible hypersensitivity reactions). Influence on diagnostic methods. At therapeutic doses, calcium dobesilate monohydrate may interfere with creatinine assay, resulting in values lower than those expected. The taking of a sample (e.g. a blood sample) required for laboratory tests must be done before the first administration of the medication in order to minimise any potential interaction between Doxium and the laboratory tests. **Ability to drive and use machines:** Taking Doxium can cause undesirable effects such as nausea, headaches and fatigue, so care is recommended when driving and operating machines. **For further information, please contact OM Pharma SA. Vifor Pharma/OM Pharma SA, 22 rue du Bois-du-Lan, 1217 Meyrin, Geneva, Switzerland.** www.viforpharma.com Version date: February 2016 – **Therapeutic indications and dosing schemes can vary from a country to another. For more information please refer to your local Summary of Product Characteristics.**

2. Rabe, E. et al. A randomized, double-blind, placebo-controlled, clinical study on the efficacy and safety of calcium dobesilate in the treatment of chronic venous insufficiency. Phlebology 31:4 (2016): 264-274.

HQ-DX-1910008

SULODEXIDE

VESSEL - VESSEL DUE F - ATERINA



ALFASIGMA

Submitted to AIFA on 23/05/2019 COD. CORP-2019-01 1) Summary of product characteristics. Sulodexide is registered in different countries with different indications
Drug subject to Medical Prescription. RR. Class C; 250 ULS soft Caps, 50 caps. Price 31,50; 600 ULS/2 ml Injectable solution, 10 vials. Price 22,75

SULODEXIDE

VESSEL - VESSEL DUE F - ATERINA

SUMMARY OF PRODUCT CHARACTERISTICS

1. MEDICINE NAME

VESSEL® 250 ULS soft capsules
VESSEL® 600 ULS/2 ml solution for injection

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Soft capsules: 250 ULS sulodexide
Ampoules: 600 ULS sulodexide
For the complete list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Soft capsules.
Solution for injection.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Chronic venous ulcers.

4.2 Posology and method of administration

Dosage

VESSEL® 250 ULS soft capsules: 1 capsule twice a day away from meals.VESSEL® 600 ULS/2 ml solution for injection: 1 ampoule a day for intramuscular or intravenous administration. As a guideline, it is recommended to start the treatment with the ampoules and after 15-20 days continue with the capsules for 30-40 days. The complete therapeutic cycle is to be repeated at least twice a year. The dosage may be changed in amount and frequency on the judgement of the physician.

Paediatric population

The safety and effectiveness of sulodexide in children and adolescents under 18 years of age have not yet been established.

4.3 Contraindications

Hypersensitivity to the active ingredient or any one of the excipients listed in section 6.1 and to heparin and heparinoids.
Diathesis and haemorrhagic diseases.

4.4 Special warnings and precautions for use

Because of its pharmaco-toxicological properties, there are no particular precautions for use of VESSEL.
However, in cases where a treatment with anticoagulants is in progress, it is advisable to periodically check the blood coagulation parameters.

4.5 Interaction with other medicinal products and other forms of interaction

Sulodexide is a heparin-like molecule and may hence increase the anticoagulant effects of heparin and oral anticoagulants if administered simultaneously. Also see section 6.2.

4.6 Fertility, pregnancy and lactation

Pregnancy

The amount of data on use of sulodexide in pregnant women is limited (less than 300 pregnancy results). Studies on animals do not indicate direct or indirect harmful effects on reproductive toxicity (see section 5.3).As a precautionary measure, it is preferable to avoid using sulodexide during pregnancy.

Breast-feeding

It is not known whether sulodexide or its metabolites are excreted in human or animal milk. A risk for new-born babies cannot be excluded. VESSEL must not be used during breast-feeding.

Fertility

Studies on animals do not indicate direct or indirect harmful effects on male and female fertility.

4.7 Effects on ability to drive and use machines

VESSEL does not alter or negligibly alters the ability to drive or use machines.

4.8 Undesirable effects

Clinical trials

The incidences of adverse drug reaction (ADR) associated with the treatment with sulodexide come from three clinical trials conducted on 430 patients treated with standard dosage and treatment times. The table below includes the adverse reactions from clinical trials listed according to the MedDRA System Organ Classes (SOC) and, in addition, according to the preferred terms in order of severity where possible. The adverse reactions have been divided by frequency classes according to the following convention: very common (<1/10); common (≥1/100, <1/10); uncommon (≥ 1/1000, <1/100); rare (≥1/10000, <1/1000); very rare (<1/10000).

MedDRA System Organ Class	Common	Uncommon
Nervous system diseases		Headache, loss of consciousness
Ear and labyrinth diseases	Vertigo	
Gastrointestinal diseases	Upper abdominal pain, diarrhoea	Gastric haemorrhage
Skin and subcutaneous tissue diseases	Skin eruption	Eczema, nettle-rash
Systemic diseases and administration site-related conditions		Bleeding during injection, peripheral oedema

Post-marketing experience

During marketing of sulodexide other undesirable events were reported.
It is not possible to determine the frequency of these undesirable events as the data derives from spontaneous reports. Consequently, the frequency of these adverse events is indicated with "unknown" (it cannot be defined based on the available data).

Soft capsules:

MedDRA System Organ Class	Frequency unknown
Haemolymphopoetic system diseases	Anaemia
Metabolism and nutrition disorders	Plasma protein metabolism disorders
Gastrointestinal diseases	Epigastralgia, nausea, vomiting, melaena, flatulence, dyspepsia
Skin and subcutaneous tissue diseases	Angioedema, ecchymosis, erythema
Reproductive system and breast diseases	Genital oedema, genital erythema, polymenorrhea

Solution for injection:

MedDRA System Organ Class	Frequency unknown
Psychiatric disorders	Derealizing
Nervous system diseases	Convulsions, tremor
Eye diseases	Sight disorder
Cardiac diseases	Palpitations
Vascular diseases	Hot flushes
Respiratory, thoracic and mediastinal diseases	Haemoptysis

Skin and subcutaneous tissue diseases	Itchiness, purpura, generalized erythema
Renal and urinary diseases	Vesical stenosis, dysuria
Systemic diseases and administration site-related conditions	Chest pain, pain, burning during injection

Reporting of suspected adverse reactions
Reporting suspected adverse reactions after authorisation of the medicinal product is important. Itallows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked treport any suspected adverse reactions via the national reporting system at the address **http://www.agenziafarmaco.gov.it/it/responsabili.**

4.9 Overdose
Haemorrhage is the only effect that may occur with an overdose. In the event of haemorrhage, inject protamine sulphate (1% solution) according to the use in "heparin haemorrhages".

5. PHARMACOLOGICAL PROPERTIES
Sulodexide has a marked antithrombotic action on both the arterial and the venous side.

5.1 Pharmacodynamic properties
Pharmacotherapeutic class: Sulodexide is classified among heparin antithrombotic drugs - ATC code: B01AB11.

Mechanism of action
Sulodexide performs an antithrombotic action on both arterial and venous level through a series of action mechanisms, such as inhibition of some factors involved in the coagulation cascade, in particular activated factor X, fibrinolytic action and inhibition of platelet adhesion. Interference with the thrombin is minimal and this limits the anticoagulant action.
Promoting the reduction of fibrinogen levels, sulodexide is effective in normalizing the altered blood viscosity of patients with vascular diseases and thrombotic risk. In addition, through activation of the lipoprotein lipase, sulodexide is effective in normalizing the altered lipidic levels.

Pharmacodynamic properties
Specific studies have shown that administration of sulodexide does not have an anticoagulant effect.

Clinical efficacy and safety
The therapeutic activity of sulodexide was evaluated in patients affected by vascular diseases with thrombotic risk, both on the arterial and the venous side. The drug proved to be particularly effective in elderly and diabetic patients.

5.2 Pharmacokinetic properties
Absorption
Absorption after oral administration in man, studied with the marked product, showed that a first blood level peak occurs after 2 hours and a second between 4 and 6 hours, after which the drug is no longer detectable in the plasma; it is again detected at about 12 hours and then remains constant until about 48 hours. The constant blood level found after 12 hours is probably due to the slow release of the drug by the absorption organs and in particular, the vessel endothelia.

Metabolism
The metabolism is mainly hepatic and the excretion mainly urinary.

Elimination
Urinary elimination
Using the marked product, 55.23% of the radioactivity administered is excreted with the urine during the first 96 hours. This elimination shows a peak after about 12 hours and a mean urinary value of 17.6% of the dose administered in the 0-24 hour interval; a second peak around the 36th hour with urinary elimination of 22% between 24 and 48 hours; a third peak around the 78th hour with a urinary elimination of 14.9% in a period of time of 48-96 hours. After 96 hours, the radioactivity is no longer detectable in the samples collected.

Faecal elimination
The total radioactivity recovered in the faeces is 23% in the first 48 hours, after which no marked substance can be detected.

Linearity/non-linearity
Pharmacological tests conducted in man with intramuscular and intravenous administration of the product show a linear dose/effect relation.

5.3 Preclinical safety data
The preclinical data based on conventional studies on pharmacological safety, toxicity at repeated doses, genotoxicity, reproductive and development toxicity do not show particular risks for man.

6. PHARMACEUTICAL PARTICULARS
6.1 List of excipients
VESSEL® 250 ULS soft capsules
Sodium lauroyl sarcosinate, silicon dioxide, triacetin, gelatine, glycerol, ethyl para-hydroxybenzoate, sodium propyl para-hydroxybenzoate, titanium dioxide (E 171), red iron oxide (E 172).
VESSEL® 600 ULS/2 ml solution for injection
Sodium chloride, water for injectable preparations.

6.2 Incompatibilities
Sulodexide being an acid polysaccharide, if administered in extemporaneous associations, it may react complexing with all basic substances. Commonly used substances incompatible in extemporaneous associations for intravenous drip are: vitamin K, complex B vitamins, hydrocortisone, hyaluronidase, calcium gluconate, quaternary ammonium salts, chloramphenicol, tetracycline, streptomycin.

6.3 Shelf-life
Soft capsules and solution for injection: 5 years.

6.4 Special precautions for storage
Store at a temperature below 30°C.

6.5 Nature and contents of container
VESSEL® 250 ULS soft capsules: cardboard box containing 2 PVC/PVDC-ALU/PVDC blister packs of 25 capsules each.
VESSEL® 600 ULS/2 ml solution for injection: cardboard box containing a polystyrene tray of 10 dark glass ampoules of solution for injection.

6.6 Special precautions for disposal and handling
No special requirements. Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

7. MARKETING AUTHORISATION HOLDER
Alfasigma S.p.A. - Via Ragazzi del '99, n. 5 - 40133 Bologna (BO)

8. MARKETING AUTHORISATON NUMBERS
"250 ULS soft capsules": 50 capsules in 2 PVC/PVDC-ALU-PVDC blister packs -A.I.C. No. 022629113
"600 ULS/2 ml solution for injection": 10 ampoules of 2 ml -A.I.C. No. 022629101

9. DATE OF FIRST AUTHORIZATION / RENEWAL OF THE AUTHORIZATION
Date of authorisation: 09/10/1972
Date of last renewal: 01/06/2010

10. DATE OF REVISION OF THE TEXT
05 July 2018

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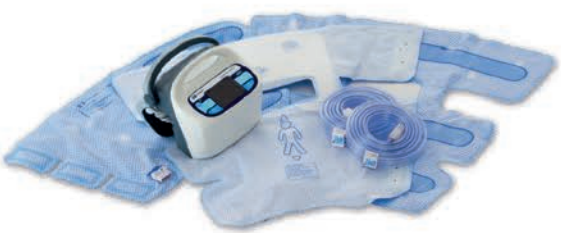

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Warning/Pay attention: CYCLO 3® FORT is registered in various countries under different conditions. CYCLO 3® FORT is not registered and not available in Switzerland. See the list of licensed countries in the flyer available at the booth. For further information, please refer to the SPC approved in your country.

COMPOSITION**: Dry Ruscus extract titrated in sterolic heterosides 150.0 mg ; Hesperidin methyl chalcone 150.0 mg ; Ascorbic acid 100.0 mg ; for one hard capsule. INDICATION **: Indicated in adults for Treatment of symptoms related to veno-lymphatic insufficiency and Treatment of functional signs linked to haemorrhoid attacks. DOSAGE AND ADMINISTRATION**: In veno-lymphatic insufficiency: usual dose is 2 to 3 capsules per day; In proctology: 4 to 5 capsules per day. CONTRAINDICATIONS**: Hypersensitivity to the active substances or to any of the excipients listed in section 6.1.**; Iron storage disorders due to the presence of ascorbic acid in the composition of the medicinal product. WARNINGS**: If diarrhoea develops, discontinue treatment. Haemorrhoid attacks: Treatment must be of short duration. The administration of the product is no substitute for specific treatment of other proctological diseases. If the symptoms do not resolve rapidly, proctological examination must be conducted and treatment must be reviewed. INTERACTION(S)**, FERTILITY**, PREGNANCY/ LACTATION**: There are no or limited amount of data available. DRIVE & USE MACHINES**, UNDESIRABLE EFFECTS**: The most commonly reported are diarrhea and abdominal pain; Uncommon: Insomnia, Dyspepsia, Nausea, Erythema, Pruritus, Muscle spasms, Pain in extremity. OVERDOSE**: No cases of overdose have been reported. PROPERTIES**: Venotonic action: in vitro, in isolated perfused vein, Ruscus extract rapidly induces (within 5 to 8 minutes) a marked, progressive and lasting contraction; in vivo, in animals, Ruscus extract administration induces an increase in venous perfusion pressure. The intensity of the effects is comparable in healthy and rendered pathological veins. Action on lymphatic circulation: lymphatic flow measured on the thoracic duct in dogs shows a significant and lasting increase. Vasculo-protective actions: a reduction in capillary permeability was demonstrated in humans. PRESENTATION*: Pack-sizes of 20, 30, 60 or 100 hard capsules. Not all pack sizes may be marketed. ** For complete information, please refer to the Summary of Product Characteristics for your country.

1. Summary of Product Characteristics Cyclo 3® Fort. 2. Nicolaides AN, *et al.* Int. Angiology;Vol. 37 pp 232-254 (2018). 3. Allaert, A. E. Int Angiol 35, 111–116 (2016). 4. de Almeida Cyrino, F. Z. G. *et al.* Clinical Hemorheology and Microcirculation 68, 371–382 (2018). 5. Rauly-Lestienne, I. *et al.* Microvascular Research 114, 1–11 (2017). 6. Bouaziz, N. *et al.* Int Angiol 18, 306–312 (1999).

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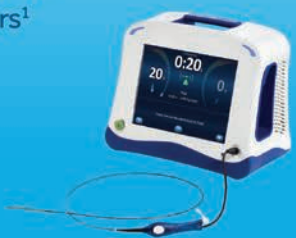

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1. Morrison N. VeClose Extension Study Five-year Results. Presented at Charing Cross, April 16, 2019; London, UK
2. Proebstle™, Alm BJ, Gockeritz O, et al. Five-year results from the prospective European ulticentre cohort study on radiofrequency segmental thermal ablation for incompetent great saphenous veins. British Journal of Surgery. Feb 2015; 102(3): 212–18.

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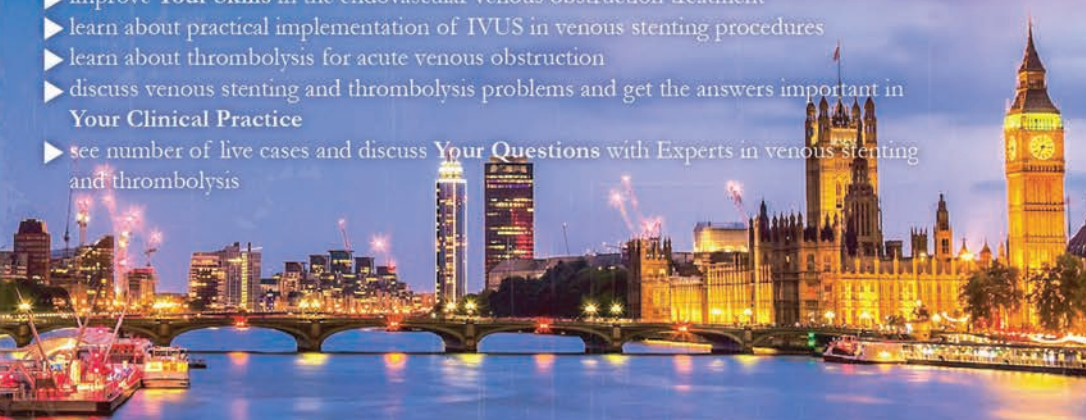

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