AMERICAN VENOUS FORUM
22ND ANNUAL MEETING
February 10–13, 2010
Ritz Carlton ▪ Amelia Island, Florida

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FUTURE MEETINGS

2011
February 23–26
Hilton San Diego Bayfront
San Diego, California

AMERICAN VENOUS FORUM FOUNDATION

The American Venous Forum Foundation was organized in 1988 to support the charitable, educational and scientific purposes of the American Venous Forum.

The Foundation provides the **BSN Jobst Fellowship Award**, the **Sigvaris Traveling Fellowship Award**, the **Servier Fellowship Award** and other significant educational grants to stimulate and recognize excellence in published writing on laboratory and clinical research in the study of venous diseases.

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THE AMERICAN VENOUS FORUM WAS ORGANIZED IN COOPERATION WITH MEMBERS OF:

Society for Vascular Surgery

American Association for Vascular Surgery

Canadian Society for Vascular Surgery

WITH THE SUPPORT OF MEMBERS OF:

International Union of Phlebology

North American Society of Phlebology

Phlebology Society of America

Austrian Society for Angiology

Benelux Society of Phlebology (Belgium, Netherlands and Luxembourg)

European Chapter of the International Society for Cardiovascular Surgery

German Society of Phlebology and Proctology

Latin American Chapter of the International Society for Cardiovascular Surgery

Swiss Society for Phlebology

Sociedad Mexicana de Angiologia

College Francais de Pathologie

Société Francaise de Phlebologie

Société Francaise d'Angéiologie

Societa Italiana de Patologia Vascolare

Pan American Society of Phlebology and Lymphology

Sociedad Argentina de Flebologia y Linfologia

Australian and New Zealand Society of Phlebology

ANNUAL MEETINGS/PAST PRESIDENTS

1989	February 22-24	John J. Bergan, MD *New Orleans, LA – Fairmont Hotel*
1990	February 21-23	Norman M. Rich, MD *Coronado, CA – Hotel Del Coronado*
1991	February 20-22	Lazar J. Greenfield, MD *Ft. Lauderdale, FL – Marina Marriott Hotel*
1992	February 26-28	Michael Hume, MD *Coronado, CA – Hotel Del Coronado*
1993	February 24-26	George Johnson, Jr., MD *Orlando, FL – Hilton Walt Disney World Village*
1994	February 23-25	James A. DeWeese, MD *Maui, HI – Maui Inter-Continental Resort*
1995	February 23-25	Robert Hobson, MD *Fort Lauderdale, FL – Marriott Harbor Beach*
1996	February 22-24	Robert L. Kistner, MD *San Diego, CA – Hyatt Regency Hotel*
1997	February 20-23	James S.T. Yao, MD *San Antonio, TX – Hyatt Regency Hill Country Resort*
1998	February 19-21	D. Eugene Strandness, Jr., MD *Lake Buena Vista, FL – Walt Disney World Swan Hotel*
1999	February 18-21	Thomas F. O'Donnell, Jr., MD *Dana Point, CA – Laguna Cliffs Marriott Resort*
2000	February 3-6	David S. Sumner, MD *Phoenix, AZ – Hilton South Mountain Resort*
2001	February 22-25	Anthony J. Comerota, MD *Ft. Myers, FL – Sanibel Harbor Resort*
2002	February 21-24	Gregory L. Moneta, MD *La Jolla, CA – Hilton Torrey Pines La Jolla*
2003	February 20-23	Peter Gloviczki, MD *Cancun, Mexico – Hilton Cancun Beach Resort*
2004	February 26-29	Frank T. Padberg, MD *Orlando, FL – Gaylord Palms Resort*
2005	February 9-13	Bo G. Eklöf, MD *San Diego, CA – Loews Coronado Bay Resort*

2006	February 22-26	Thomas W. Wakefield, MD *Miami, FL – InterContinental Hotel*
2007	February 14-17	Michael C. Dalsing, MD *San Diego, CA – Rancho Bernardo Inn*
2008	February 20-23	Mark H. Meissner, MD *Charleston, SC – Charlston Place*
2009	February 11-14	Joann Lohr, MD *Phoenix, AZ – Arizona Grand Resort*

D. EUGENE STRANDNESS JR., MD MEMORIAL LECTURE

On January 7, 2002, the American Venous Forum was saddened by the passing of one of its founding members and past presidents, Dr. D. Eugene Strandness Jr. Dr. Strandness was a friend, mentor, colleague and leader in all aspects of vascular surgery. He held several NIH grants and wrote numerous publications on the etiology and non-invasive diagnosis of deep vein thrombosis. One of his most notable accomplishments was the development of duplex ultrasound scanning. His tireless pursuit of knowledge led to a better understanding of the natural history of venous disease and its diagnosis and treatment, for which our patients and we are forever indebted to him.

Each year, the D. Eugene Strandness Jr., MD Memorial Lecture recognizes the significant contributions of an individual in research, education or clinical investigation in the field of venous diseases. The recipient of this distinction, chosen by the president of the American Venous Forum and confirmed by the Forum's Executive Committee, has previously been named to the position of Presidential Guest Lecturer. In honor of the memory of Dr. Strandness, the lectureship was renamed in 2003 and is now known as the "D. Eugene Strandness Jr., MD Memorial Lecture."

This honor, the highest given by the organization, has been bestowed to the following outstanding candidates in past years:

2010 **Manuel Monreal Bosch, MD, Madrid, Spain**
RIETE Database and Multiple Clinical Perspectives

2009 **O. William Brown, MD, Bingham Farms, Michigan**
Venous Disease and Medical Malpractice: A Peek Inside the Playbook of a Plaintiff's Attorney

2008 **Thomas O'Donnell, Jr., MD, Boston, Massachusetts**
What's the Evidence for Treating Perforators in Venous Ulcers

2007 **Robert L. Kistner, MD, Honolulu, Hawaii**
Foresight 2020: Creating the Venous Vision

2006 **Pan Ganguly, PhD, Bethesda, Maryland**
The Challenges in Venous Thrombosis

2005 **Michel R. Perrin, MD, Chassieu, France**
The Importance of International Collaboration for the Development of a Scientific Approach to Venous Disease

2004 **Professor Eberhard Rabe, MD, Bonn, Germany**
Prevalence and Risk Factors of Chronic Venous Diseases: The Bonn Vein Study

2003 **Professor Claudio Allegra, MD, Rome, Italy**
Involvement of the Microcirculation in Chronic Venous Insufficiency

2002 **Professor Alfred Bollinger, MD, Zurich, Switzerland**
Microcirculation in Chronic Venous Insufficiency and Lymphedema

2001 **Professor C.V. Ruckley, MD, Edinburgh, Scotland**
Chronic Venous Insufficiency: Lessons from Scotland

2000 **Professor Sir Norman Browse, MD, FRCS, FRCP, Channel Islands, England**
Forty Years On

1999 **David Robinson, PhD, Bethesda, Maryland**
A Journey to Complexity: The Continuing Evolution in Vascular Research

1998 **David Bergquist, MD, PhD, Uppsala, Sweden**
Chronic Leg Ulcer—The Impact of Venous Disease

1997 **Professor Kevin G. Burnand, London, United Kingdom**
Venous Thrombosis and Natural Thrombolysis

1996 **Ermenegildo A. Enrici, MD, Buenos Aires, Argentina**
The Role of the Perforants' System in Deep Venous Chronic Insufficiency in its Different Stages: Surgical Indications, Tactics and Techniques

1995 **Philip D. Coleridge Smith, MD, FRCS, London, United Kingdom**
Venous Disease and Leukocyte Mediated Microcirculatory Injury

1994 **Andrew W. Nicolaides, MD, FRCS, London, United Kingdom**
Deep Vein Thrombosis—Aetiology and Prevention: The Legacies of the 70's, the Promises of the 80's and the Challenges of the 90's

1993 **Olav Thulesius, MD, PhD, Linkoping, Sweden**
Vein Wall Characteristics and Valvular Functions in Chronic Venous Insufficiency

1992 **G.W. Schmid-Schonbein, MD, La Jolla, California**
Leukocytes as Mediators of Tissue Injury

1991 **Jack Hirsh, MD, Hamilton, Ontario, Canada**
Development of Low Molecular Weight Heparin for Clinical Use

1990 **Hugo Partsch, MD, Vienna, Austria**
Diagnosis of AV Fistulas in Vascular Malformations

2010
D. EUGENE STRANDNESS, JR., MD MEMORIAL LECTURE

RIETE Database and Multiple Clinical Perspectives

Manuel Monreal Bosch, MD

Since April 1992:
Head of Section, Internal Medicine, Hospital Universitari Germans Trias i Pujol, 08916 Badalona (Barcelona), Spain

Since September 1983:
Professor of Medicine, Facultat de Medicina, Universitat Autónoma de Barcelona

Since January 2001:
Coordinator of the International Registry of Patients With Venous Thromboembolism (RIETE)

Since March 2001:
Chair of the Working Group on Thromboembolism, Spanish Society of Internal Medicine

MEMORIAL LECTURE

This lecture will be presented on Saturday, February 13, 2010 at 11:30 am.
Please plan to attend this featured presentation.

JOBST RESEARCH FELLOWSHIP IN VENOUS AND LYMPHATIC DISEASE

In 1995, the American Venous Forum Foundation announced the establishment of the Jobst Research Fellowship In Venous and Lymphatic Disease.

The Jobst Research Fellowship provides a one-year, $25,000 grant to a research fellow chosen through a competitive peer-review selection process. A committee of distinguished vascular physicians, appointed by the American Venous Forum Foundation, determines the fellowship recipient and announces its selection during the opening session of the Annual Meeting.

1995	**Peter J. Pappas, MD**, UMDNJ New Jersey Medical School
1996	**Jae-Sung Cho, MD**, Mayo Clinic, Rochester, MN
1997	**Andrew C. Stanley, MD**, Burlington, VT
1998	**Klaus See-Tho, MD**, Stanford University Medical Center
1999	**Joseph D. Raffetto, MD**, Boston Medical Center
2000	**No Award Given**
2001	**Brajesh K. Lal, MD**, UMDNJ New Jersey Medical School
2002	**Susan O'Shea, MD**, Duke University Medical Center
2003	**Charles Fields, MD**, Mayo Clinic
2004	**John Rectenwald, MD**, University of Michigan
2005	**Allesandra Puggioni, MD**, Mayo Clinic
2006	**Stephanie K. Beidler, MD**, University of North Carolina
2007	**Danny Vo, MD**, Mayo Clinic
2008	**K. Barry Deatrick, MD**, University of Michigan
2009	**Carolyn Glass, MD**, University of Rochester

SIGVARIS, INC. TRAVELING FELLOWSHIP IN VENOUS DISEASE

Sigvaris, Inc. initially established this $12,000 Traveling Fellowship to provide a selected candidate with the opportunity to visit medical centers throughout the United States, Europe and elsewhere which have established themselves as centers of excellence in the management of venous disease. In 2006, the Award criteria was changed to encourage fellows to submit abstracts, attend the Forum's Annual Meeting and broadened to include up to four (4) finalists, who would each receive up to $3,000 in travel reimbursement associated with attending the meeting. Finalists also receive free one-year candidate membership in the American Venous Forum. The finalists present their work during a special dinner hosted by Sigvaris.

1997	**Mark H. Meissner, MD**, University of Washington Medical Center
1998	**Paul R. Cordts, MD**, Triple Army Medical Center
1999	**E. John Harris, Jr., MD**, Stanford University Medical Center
2000	**Harold J. Welch, MD**, Lahey Clinic Medical Center
2001	**David L. Gillespie, MD**, Uniformed Services University of the Health Sciences
2002	**Joseph D. Raffetto, MD**, Boston Medical Center
2003	**Audra Noel, MD**, Mayo Clinic
2004	**Robert McLafferty, MD**, Southern Illinois University
2005	**Antonios P. Gasparis, MD**, Stony Brook University
2006	**Beverly Sharp, MD**, Charing Cross Hospital
	Biju Aravind, MD, Charing Cross Hospital
2007	**Alisha Oropallo, MD**, Boston Medical Center
	M.K. Barsoumi, MD, Mayo Clinic
	Prandath Lall, MD, Mayo Clinic
	Eugene Palchick, MD, University of Rochester
2008	**Stephanie Beidler, MD**, University of North Carolina
	Michael Lebow, MD, University of Tennessee
	Brian Knipp, MD, University of Michigan
	Jung-Ah Lee, MD, University of Washington
2009	**Barbara Moreira, MD**, Wayne State University
	Alejandro Perez, MD, Cleveland Clinic

SERVIER TRAVELING FELLOWSHIP

The Servier Traveling Fellowship provides two fellows an opportunity to travel to the European Venous Forum to present his or her scientific research. Four (4) finalists are identified through a competitive peer-review process, and are invited to present their science during the AVF Meeting. Travel and accommodations for the four finalists are reimbursed as part of the grant. The finalists are judged by an appointed AVF committee. Two winners will be selected to present their work at the European Venous Forum.

2006	**Charles Stonerock, MD**, Indiana University School of Medicine **Gustavo Oderich, MD**, Mayo Clinic
2007	**Brian Knipp, MD**, University of Michigan **Reagan Quan, MD**, Walter Reed Army Medical Center
2008	**David Paolini, MD**, Toledo Hospital **Jorge Martinez, MD**, Toledo Hospital
2009	**Atul Rao, MD**, University of Pittsburgh Medical Center **Axel Thors, MD**, Good Samaritan Hospital

BEST POSTERS

Each year, a formal poster session is held where authors are invited to give a 3-minute synopsis of their work followed by a 2-minute Q & A with the audience in attendance. Posters are scored and prizes are awarded to the top presentations.

2009 WINNERS

David L. Gillespie
The Proliferative Capacity of Dermal Fibroblasts from Patients with Chronic Venous Insufficiency Is Reduced in Physiologic Concentrations in Glucose

Marzia Lugli
Crossed-Tape Technique: A Method to Increase Eccentric Compression Pressure

Christopher J. Pannucci
Underutilization of Venous Thromboembolism Prophylaxis in Reconstructive Breast Surgery: A Survey of 606 Plastic Surgeons

GENERAL INFORMATION

REGISTRATION DESK

The Registration Desk will be located in the foyer of the Lobby Level and will be open during the following hours:

Tuesday, February 9	4:00 pm – 6:00 pm
Wednesday, February 10	7:00 am – 5:30 pm
Thursday, February 11	7:00 am – 6:00pm
Friday, February 12	7:00 am – 12:00 pm
Saturday, February 13	7:00 am – 5:30 pm

REGISTRATION INFORMATION

Full Registration Fee Includes: The full registration fee includes all scientific sessions, Postgraduate Course, continental breakfast, coffee breaks and boxed lunches. In addition, the registration fee includes entrance to the Exhibit Hall, the Welcome Reception on Wednesday and the Forum Finale on Saturday evening.

Guest/Spouse Registration Fee Includes: The spouse/guest registration fee includes the Welcome Reception, continental breakfast, mid-morning refreshments daily in the Hospitality Suite and Forum Finale on Saturday evening.

ANNUAL BUSINESS MEETING LUNCH (Members Only)

The Annual Business Meeting will be held on Friday, February 12, 2010 at 11:30 am in Talbot A-C.

INSTRUCTIONS TO AUTHORS

Audio/Visual
All presentations must be formatted using PowerPoint. All presenters must bring their PowerPoint presentations on CD Rom or Flash Drive (USB) to the Speaker Ready Room at least two hours prior to their scheduled presentation.

Manuscripts
The American Venous Forum requires presenting authors of oral presentations to submit the full manuscript for journal publication. The *Journal of Vascular Surgery* is the official journal of the American Venous Forum, although authors may petition the AVF Recorder in writing to submit their manuscript to an alternate Index-Medicus, peer-reviewed journal. Presenters who fail to submit a manuscript to a recognized journal shall forfeit their right to present any material at two (2) consecutive future meetings of the American Venous Forum.

SCHEDULE-AT-A-GLANCE

22nd Annual Meeting
February 10-13, 2010
Ritz Carlton ▪ Amelia Island, Florida

WEDNESDAY, FEBRUARY 10, 2010

7:00 AM – 8:00 AM **Continental Breakfast**

8:00 AM – 12:00 PM **POSTGRADUATE COURSE**
Updates & Debates
Moderator: Peter J. Pappas, MD

12:00 PM – 1:00 PM **LUNCH SYMPOSIUM**
Venous Hemodynamics
Moderator: Lowell S. Kabnick, MD

1:15 PM – 3:15 PM **SCIENTIFIC SESSION I**
Deep Vein Thrombosis
Moderators: Joseph A. Caprini, MD
Peter Henke, MD

1:15 PM – 1:35 PM **1.** **Inflow Thrombosis Does Not Adversely Affect Thrombolysis Outcomes of Symptomatic Iliofemoral DVT**
G. Jeyabalan, G. Konig, L. Marone, R. Rhee, M. Makaroun, J. Cho, R. Chaer
University of Pittsburgh Medical Center, Pittsburgh, PA

1:35 PM – 1:55 PM **2.** **Objective Outcome Measures of Patients with Iliofemoral DVT Treated with Catheter-Directed Thrombolysis**
N.K. Grewal[1], J. Trabal Martinez[1], L. Andrews[1], Z. Assi[2], S. Kasanjian[2], A.J. Comerota[1]
[1]Jobst Vascular Center, The Toledo Hospital, Toledo, OH; [2]Interventional Radiology, The Toledo Hospital, Toledo, OH

1:55 PM – 2:15 PM **3.** **Anticoagulation Monitoring By an Anticoagulation Service Is More Cost-Effective Than Routine Physician Care**
F. Aziz, M. Corder, A.J. Comerota
Jobst Vascular Center, The Toledo Hospital, Toledo, OH

2:15 PM – 2:35 PM **4.** **Magnetic Resonance T1-Mapping Quantifies the Organisation of Resolving Venous Thrombi**

P. Saha, U. Blume, A. Wiethoff, G. Varma, D. Eastham, M. Waltham, T. Schaeffter, A. Patel, A. Ahmad, C. Evans, B. Modarai, A. Smith
King's College London, London, United Kingdom

2:35 PM – 2:55 PM **5.** **The Controversy of Managing Calf Vein Thrombosis: A Systematic Review**

E.M. Masuda[1], F. Liquido[1], Q. He[2]
[1]Straub Clinic & Hospital, Honolulu, HI; [2]Pacific Health Research Institute, Honolulu, HI

2:55 PM – 3:15 PM **6.** **Validation of the Caprini Risk Assessment Model in Plastic and Reconstructive Surgery Patients**

C.J. Pannucci[1], S. Bailey[2], C. Fisher[3], J. Clavijo-Alvarez[3], J. Hamill[4], K. Hume[4], T. Wakefield[1], J. Rubin[3], E. Wilkins[1], R. Hoxworth[2]
[1]University of Michigan, Ann Arbor, MI; [2]University of Texas-Southwestern, Dallas, TX; [3]University of Pittsburgh, Pittsburgh, PA; [4]American Society of Plastic Surgeons, Arlington Heights, IL

3:15 PM – 3:25 PM **VENOUS FORUM OF THE ROYAL SOCIETY OF MEDICINE** *(Best Paper)*

Post-Procedure Pain, Safety and Efficacy Following Great Saphenous Vein (GSV) Endovenous Laser Ablation (EVLA) Using a 1470 nm Diode Laser

Anna Ikponmwosa[1], Rosie Darwood[1], Michael Gough[1], Michael Gaunt[2]
[1]Leeds Vascular Institute; [2]Addenbrookes Hospital, Cambridge

3:25 PM – 3:45 PM **Coffee Break**

3:45 PM – 5:30 PM **ASK THE EXPERTS**
VTE Management (Cases)
Moderator: Peter Henke, MD

6:00 PM – 7:30 PM **WELCOME RECEPTION**

THURSDAY, FEBRUARY 11, 2010

7:00 AM – 8:00 AM **Continental Breakfast — Exhibits Open**

8:00 AM – 10:00 AM **SCIENTIFIC SESSION II**
Chronic Venous Insufficiency
Moderators: *Mark D. Iafrati, MD*
Robert B. McLafferty, MD

8:00 AM – 8:20 AM **7.** **Healing of Venous Leg Ulcers Is Impaired in Carriers of the Hemochromatosis SNP HFE H63D When Leg Compression Is Performed with High Instead of Moderate Strength Compression**
W. Blaettler[1], B.O. Eugenio[2], F. Amsler[3]
[1]Clinical and Interventional Angiology, University Hospital Bern, Switzerland; [2]Groupo Internacional de la Compresion, Buenos Aires, Argentina; [3]Amslerconsulting, Biel-Benken, Switzerland, Switzerland

8:20 AM – 8:40 AM **8.** **Incidence of and Risk Factors for Ilio-Caval Venous Obstruction in Patients with Chronic Venous Leg Ulcers**
W. Marston, D. Fish, B. Keagy
University of North Carolina, Chapel Hill, NC

8:40 AM – 9:00 AM **9.** **Stenting for Iliac Veins Post-Thrombotic Obstructive Lesions: Results of a Multicentric Retrospective Study**
O. Hartung[1], M. Lugli[2], P. Nicolini[3], M. Boufi[1], O. Maleti[2], Y.S. Alimi[1]
[1]CHU Nord, Marseille, France; [2]Hesperia Hospital, Modena, Italy; [3]Clinique du Grand Large, Lyon, France

9:00 AM – 9:20 AM **10.** **The Efficacy of New VEINOPLUS® Stimulation Technology to Increase Venous Flow and Prevent Venous Stasis**
M.B. Griffin[1], A.N. Nicolaides[1], D. Bond[1], G. Geroulakos[2], E. Kalodiki[2]
[1]The Vascular Noninvasive Screening and Diagnostic Centre, London, United Kingdom; [2]Ealing NHS Trust Hospital, London, United Kingdom

9:20 AM – 9:40 AM **11.** **Period Prevalence of Iliofemoral Venous Occlusive Disease By Doppler Ultrasound and Corresponding Treatment in a Tertiary Care Facility**

P.R. Crisostomo, J. Cho, B. Feliciano, J. Klein, D. Jones, M.C. Dalsing
Indiana University, Indianapolis, IN

MINI PRESENTATIONS

9:40 AM – 9:45 AM **M1.** **Influence of the Location and the Volume of Varicose Vein on Recurrence After Phlebectomy with Preservation of a Refluxing Great Saphenous Vein**

P. Pittaluga, S. Chastanet, T. Locret
Riviera Veine Institut, Nice, France

9:45 AM – 9:50 AM **M2.** **Perforating Veins: Anatomical and Functional Characterization**

A. Orrego
Centro Clínico de Especialidades Vasculares, Viña del Mar, Chile

9:50 AM – 9:55 AM **M3.** **What Is the Method of Choice for Treatment of Obesity Patients with Chronic Venous Diseases?**

S.M. Belentsov
City Cllinic Hospital #40, Yekaterinburg, Russian Federation

9:55 AM – 10:00 AM **National Screening Program Update: 2009**
Marc A. Passman, MD, Chairman

10:00 AM – 10:45 AM **Coffee Break**

10:45 AM – 12:45 PM **SCIENTIFIC SESSION III**
Superficial Vein Disease
Moderators: *Joseph D. Raffetto, MD*
Julianne Stoughton, MD

10:45 AM – 11:05 AM **12.** **Incidence of Varicose Veins, CVI and Progression of the Disease in the Bonn Vein Study II**

E. Rabe[1], F. Pannier[2], A. Ko[1], G. Berboth[1], B. Hoffmann[3], S. Hertel[3]
[1]Dermatologische Universitaetsklinik, Bonn, Germany; [2]Department of Dermatology, AZM, Maastricht, Netherlands; [3]Institut für Med. Informatik, Biometrie und Epidemiologie, University of Essen, Essen, Germany

11:05 AM – 11:25 AM **13.** **Prolonged Mechanical Stretch Is Associated with Upregulation of Hypoxia-Inducible Factors and Reduced Contraction in Rat Inferior Vena Cava**

C.S. Lim[1], X. Qiao[2], V. Mam[3], Y. Xia[2], J.D. Raffetto[4], E. Paleolog[1], A.H. Davies[1], R.A. Khalil[2]

[1]Imperial College London, London, United Kingdom; [2]Brigham & Women's Hospital, Boston, MA, [3]Brigham & Women's Hospital, Boston, MA; [4]VA Boston HCS, West Roxbury, MA

11:25 AM – 11:45 AM **14.** **Ca^{2+}-Dependent Venous Contraction By the Saponoside Escin in Rat Inferior Vena Cava: Implications in Venotonic Treatment of Varicose Veins**

J.D. Raffetto, R.A. Khalil

Brigham and Women's Hospital, Boston, MA

11:45 AM – 12:05 PM **15.** **Neither Ascending Nor Descending Theory Can Fully Explain the Pattern of Venous Reflux in Patients with Primary Chronic Venous Disease**

M.I. Qureshi, A. MacDonald, L. Wing, C.S. Lim, M. Ellis, I.J. Franklin, A.H. Davies

Imperial College London, London, United Kingdom

12:05 PM – 12:25 PM **16.** **Endovenous Radiofrequency Treatment for Patients with Chronic Venous Insufficiency and Venous Ulcerations**

C.J. Marrocco, M.D. Atkins, Jr., W.T. Bohannon, T.R. Warren, C.J. Buckley, R.L. Bush

Scott & White Hospital, Temple, TX

MINI PRESENTATIONS

12:25 PM – 12:30 PM **M4.** **VNUS Closure FAST™ Ablation Versus Laser for Varicose Veins (VALVV): A Randomised Clinical Trial—Preliminary Results**

A.C. Shepherd, M.S. Gohel, L.C. Brown, M.J. Metcalfe, M. Hamish, A.H. Davies

Imperial College, London, United Kingdom

12:30 PM – 12:35 PM **M5.** **The ClariVein Catheter Trial: Final Results and Recommendations**

S. Elias

Mount Sinai School of Medicine, Englewood, NJ

12:35 PM – 12:40 PM **M6. The Influence of Residual Varicose Veins After GSV Stripping on Recurrence in a Long Term Follow Up**
T. Ogawa, S. Hoshino
Fukushima Daiichi Hospital, Fukushima, Japan

12:45 PM – 2:00 PM **INDUSTRY ADVISORY COMMITTEE LUNCH**
(By Invitation)

2:00 PM – 4:30 PM **WORKSHOPS/SYMPOSIUMS**
(Parallel Sessions)

4:30 PM – 6:30 PM **POSTER SESSION**
Wine & Cheese Reception

FRIDAY, FEBRUARY 12, 2010

7:00 AM – 7:30 AM **Continental Breakfast — Exhibits Open**

7:30 AM – 8:50 AM **SCIENTIFIC SESSION IV**
Multi-Topic
Moderators: *Michael A. Vasquez, MD*
M. Ashraf Mansour, MD

7:30 AM – 7:50 AM **17. Validation of Venous Clinical Severity Score (VCSS) with Other Venous Severity Assessment Tools: Analysis from the National Venous Screening Program**

M.A. Passman[1], R.B. McLafferty[2], M.F. Lentz[3], S.B. Nagre[1], M.D. Iafrati[4], W.T. Bohannon[5], C.M. Moore[2], J.A. Heller[6], J.R. Schneider[7], J.M. Lohr[8], J.A. Caprini[9]
[1]University of Alabama at Birmingham, Birmingham, AL; [2]Southern Illinois University, Springfield, IL, [3]National Venous Screening Program, Baltimore, MD; [4]Tufts University, Boston, MA; [5]Scott & White, Temple, TX; [6]Johns Hopkins University, Baltimore, MD; [7]Central Dupage Hospital, Winfield, IL; [8]Lohr Surgical Specialists, Cincinnati, OH; [9]Evanston Hospital, Evanston, IL

7:50 AM – 8:10 AM **18. AVF Membership: Who Are We and Where Are We Going?**

J.M. Lohr
Lohr Surgical Specialists, LLC, Cincinnati, OH

8:10 AM – 8:30 AM **19. Penetrating Inferior Vena Cava Injuries are Associated with Thromboembolic Complications: A Review of the National Trauma Data Bank**

F.L. Joglar, P. Shaw, R. Eberhardt, N. Hamburg, J. Kalish, D. Rybin, G. Doros, A. Farber
Boston University Medical Center, Boston, MA

8:30 AM – 8:50 AM **20.** **Endovascular Treatment for Chronic Cerebrospinal Venous Insufficiency in Multiple Sclerosis: A Longitudinal MRI Blinded Pilot Study**

P. Zamboni[1], R. Galeotti[1], B. Weinstock-Guttman[2], G. Cutter[3], E. Menegatti[1], A.M. Malagoni[1], I. Bartolomei[4], J.L. Cox[2], F. Salvi[4], R. Zivadinov[2]
[1]University of Ferrara, Ferrara, Italy; [2]NY State University in Buffalo, Buffalo, NY; [3]University of Alabama, Birmingham, AL; [4]Bellaria Neurosciences, Bologna, Italy

8:50 AM – 9:00 AM **EUROPEAN VENOUS FORUM**
(First Place Winner)

Intraluminal Fibre-Tip Centering Can Improve Endovenous Laser Ablation: A Histological Study

M. Vuylsteke[1], J. Van Dorpe[2], J. Roelens[3], Th. De Bo[1], S. Mordon[4]
[1]Department of Vascular Surgery Sint-Andriesziekenhuis Tielt Belgium; [2]Department of Pathology Heilig-Hartziekenhuis Roeselare Belgium; [3]Department of Pathology Sint-Andriesziekenhuis Tielt Belgium; [4]INSERM U 703, Lille University Hospital, 59037 Lille, France (SM)

9:00 AM – 9:10 AM **EUROPEAN VENOUS FORUM**
(Second Place Winner)

Atresia of the Inferior Vena Cava and Iliofemoral Venous Thrombosis—Experiences with Catheter-Directed Thrombolysis

Rikke Broholm, Niels Bækgaard, Sven Just, Maja Jørgensen og Leif Panduro Jensen
Department of Vascular Surgery, Department of Radiology and the Thrombosis Centre, Gentofte University Hospital, Denmark

9:10 AM – 9:20 AM **ACP PLATINUM ABSTRACT**

Comparison of Transcranial Doppler Hits Detection During CO2-O2 Versus Air-Based Foam Sclerotherapy of Superficial Veins of the Lower Extremity

Diana L. Neuhardt, RVT

9:20 AM – 9:45 AM **Coffee Break — Visit Exhibits**

9:45 AM – 11:45 AM	**SCIENTIFIC SESSION V** **Award Session** *Moderator: Joseph A. Caprini, MD* *Peter J. Pappas, MD*
10:15 AM – 10:30 AM	**Presidential Address Introduction** *Introduction By: Peter J. Pappas, MD* *President-Elect*
10:30 AM – 11:30 AM	**PRESIDENTIAL ADDRESS** **Hemostasis and Thrombosis: Personal Reflections 40 Years On** Joseph A. Caprini, MD
11:30 AM – 12:30 PM	**MEMBER BUSINESS LUNCHEON**
12:30 PM	**Free Afternoon** *Golf/Tennis Tournaments*

SATURDAY, FEBRUARY 13, 2010

7:00 AM – 8:00 AM **Continental Breakfast — Visit Exhibits**

8:00 AM – 9:25 AM **SCIENTIFIC SESSION VI**
IVC and Filters
Moderators: *David L. Gillespie, MD*
Antonios P. Gasparis, MD

8:00 AM – 8:20 AM **21.** **Stenting of Chronically Obstructed IVC-Filters**
P. Neglén, M.D. Oglesbee, S. Raju
River Oaks Hospital, Flowood, MS

8:20 AM – 8:40 AM **22.** **Prospective Randomized Study Comparing the Clinical Outcomes Between IVC Greenfield Filter and TrapEase Filters**
A. Hingorani, E. Ascher, N. Marks, F. Usoh, A. Shiferson, K. Gopal, D. Jung, S. Reddy, T. Jacob
Maimonides Medical Center, Brooklyn, NY

8:40 AM – 9:00 AM **23.** **Cost-Effectiveness of Guidelines for Insertion of Inferior Vena Cava Filters in High-Risk Trauma Patients**
E.L. Spangler, E.D. Dillavou, K.J. Smith
University of Pittsburgh, Pittsburgh, PA

9:00 AM – 9:20 AM **24.** **Large Vein Reconstruction with Oncologic Procedures**
M.A. Mansour, B. Wheatley, J.M. Gorsuch, C.A. Chambers, R.F. Cuff
Michigan State University, Grand Rapids, MI

9:20 AM – 9:25 AM **Poster Winner #1**

9:25 AM – 10:00 AM **Coffee Break**

10:05 AM – 12:30 PM **SCIENTIFIC SESSION VII**
Chronic Venous Insufficiency
Moderators: *William A. Marston, MD*
Nicos Labropoulos, MD

10:05 AM – 10:25 AM 25. **Post-Menopausal Leg Swelling**
S. Raju[1], M. Oglesbee[2], P. Neglen[2]
[1]University of Mississippi Medical Center, Jackson, MS; [2]River Oaks Hospital, Flowood, MS

10:25 AM – 10:45 AM 26. **Neonatal and Adult Dermal Fibroblasts Show Differences in TGF-ß Secretion and TGF-ß Type II Receptor Expression at Baseline and Under Constant Stretch Conditions**
C. Glass, J. Cullen, E. Roztocil, C. Doan, G. Augustin, K. Illig, M. Singh, D. Gillespie
University of Rochester, Rochester, NY

10:45 AM – 11:05 AM 27. **Post Thrombotic Vein Wall Remodeling: Preliminary Findings**
K. Deatrick, N. Baker, S. DeRoo, M.A. Elfline, V. Sood, C. Stabler, S.A. Blackburn, C.E. Luke, T.W. Wakefield, P.K. Henke
University of Michigan, Ann Arbor, MI

11:05 AM – 11:25 AM 28. **Development of a Questionnaire to Evaluate the Burden of Chronic Venous Disease in Daily Life**
J. Guex, Sr.[1], N. Rahhali, Jr.[2], C. Taieb, Jr.[2]
[1]SFP, Nice, France; [2]PFSA, Boulogne, France

11:25 AM – 11: 30 AM **Poster Winner #2**

11:30 AM – 12:30 PM **D. EUGENE STRANDNESS MEMORIAL LECTURE**

RIETE Database and Multiple Clinical Perspectives
Manuel Monreal Bosch, Barcelona, Spain
Introduced By: Joseph A. Caprini, MD

12:30 PM – 1:45 PM **LUNCH SYMPOSIUM**

Venous Research & Education—Where Do We Go From Here? (A Look at the Impact of AdvaMed and PhRMA Codes)
Steve Elias, MD

1:55 PM – 3:00 PM **SCIENTIFIC SESSION VIII**
Lymphedema and Compression
Moderators: Fedor Lurie, MD
Peter J. Pappas, MD

1:55 PM – 2:15 PM **29. A Novel Method of Measuring Human Lymphatic Pumping in Healthy and Lymphedematous Legs Using Indocyanine Green Fluorescence Lymphography**
N. Unno[1], M. Nishiyama[1], M. Suzuki[1], N. Yamamoto[1], H. Tanaka[1], D. Sagara[1], Y. Mano[1], Y. Mano[1], M. Sano[1], H. Konno[2]
[1]Division of Vascular Surgery, Hamamatsu University School of Medicine, Hamamatsu, Japan; [2]Second Department of Surgery, Hamamatsu University School of Medicine, Hamamatsu, Japan

2:15 PM – 2:35 PM **30. Inelastic Compression Is Effective Over Time in Spite of Significant Pressure Drop**
G. Mosti[1], H. Partsch[2]
[1]Clinica MD Barbantini, Lucca (LU), Italy; [2]Private Practice, Wien, Austria

2:35 PM – 2:55 PM **31. A Randomized Trial of Class 2 and Class 3 Elastic Compression in the Prevention of Recurrence of Venous Ulceration**
D.J. Milic, S.S. Zivic, D.C. Bogdanovic, M. Pejic, Z. Roljic, M. Jovanovic
Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia

2:55 PM – 3:00 PM **Poster Winner #3**

3:00 PM – 3:15 PM **Coffee Break**

3:15 PM – 5:00 PM **ASK THE EXPERTS**
Venous Thrombolysis
Moderator: Antonios P. Gasparis, MD

5:00 PM **Adjourn**

7:30 PM – 10:00 PM **THE FORUM FINALE**
Awards, Dinner, Entertainment & More!

AMERICAN VENOUS FORUM
22ND ANNUAL MEETING
February 10–13, 2010
Ritz Carlton ▪ Amelia Island, Florida

WEDNESDAY, FEBRUARY 10, 2010

7:00 AM – 8:00 AM — **Continental Breakfast**

8:00 AM – 12:00 PM — **POSTGRADUATE COURSE**
Updates & Debates
Moderator: *Peter J. Pappas, MD*

Educational Objectives: At the conclusion of the Postgraduate Course, attendees will have a broader understanding of the use of vena caval interruption devices, as well as the effectiveness of venous stenting. Participants will also be able to discern the current CEAP classification scoring system and determine whether it needs to be revised. Attendees will also have better insight as to whether there is a need for a board examination in phlebology.

NEW TRENDS
(No CME will be provided for this session.)

8:00 AM – 8:20 AM — **Technologies of the Future: What Do We Need and Where Are We Going?**
David Doster, AngioDynamics

8:20 AM – 8:40 AM — **Advances in Medical Imaging for Venous Disease: Where Are We and Where Do We Need to Go?**
Brajesh K. Lal, MD

8:40 AM – 9:00 AM **Developing Commercially Available Foam: Update on Current Clinic Trials**
David Wright, MD, Chief Medical Officer – BTG Corporation

9:00 AM – 9:30 AM **Panel Discussion**

9:30 AM – 10:00 AM **Coffee Break**

DEBATES

10:00 AM – 10:30 AM **Do We Need Some Sort of Board Certification for Venous Disease Practitioners?**
PRO: *Anthony Comerota, MD*
CON: *Mark H. Meissner, MD*

10:30 AM – 11:00 AM **To Stent or Not to Stent? That Is the Question**
PRO: *Peter Neglen, MD*
CON: *Gregory L. Moneta, MD*

11:00 AM – 11:30 AM **We Need Stricter Criteria for the Use of Caval Interruption Devices**
PRO: *David L. Gillespie, MD*
CON: *Marc A. Passman, MD*

11:30 AM – 12:00 PM **CEAP: Does it Need to Be Revised Again?**
PRO: *Patrick Carpentier, MD*
CON: *Michael Dalsing, MD*

12:00 PM – 1:00 PM **LUNCH SYMPOSIUM**
Venous Hemodynamics
Moderator: *Lowell S. Kabnick, MD*

Educational Objectives: At the conclusion of the session, attendees will understand the different approaches CHIVA, ASVAL and the USA for the treatment of superficial venous disease based on venous hemodynamics.

Revisiting Chiva
Paulo Zamboni, MD

Revisiting ASVAL
Paul Pittaluga, MD

Review of the Literature
Mark Meissner, MD

Current Venous Pathophysiology
Fedor Lurie, MD

1:15 PM – 3:15 PM **SCIENTIFIC SESSION I**
Deep Vein Thrombosis
Moderators: *Joseph A. Caprini, MD*
Peter Henke, MD

Educational Objectives: After completion of this session, the participant will be able to:

1. Describe the interventional treatments and indications in patients with iliofemoral DVT.
2. Define up to date anticoagulation monitoring
3. Determine the indications for alternative DVT imaging.
4. Define DVT risk assessment in surgical specialty patients.

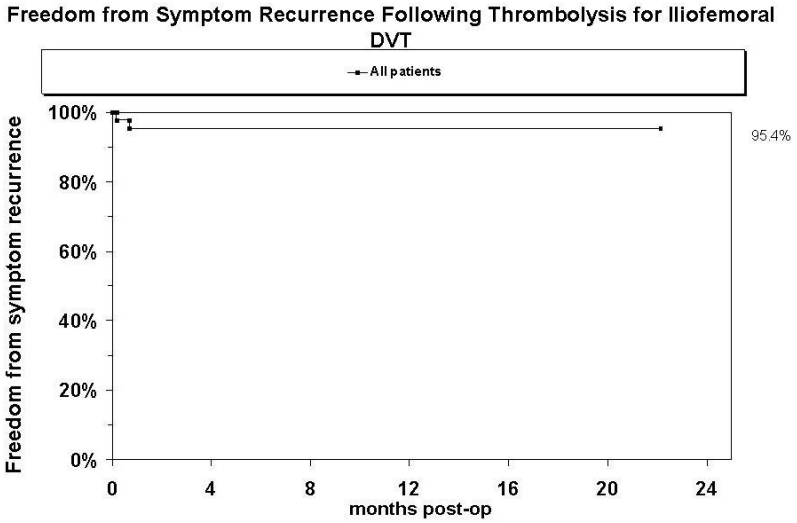
1:15 PM – 1:35 PM **1. Inflow Thrombosis Does Not Adversely Affect Thrombolysis Outcomes of Symptomatic Iliofemoral DVT**

G. Jeyabalan, G. Konig, L. Marone, R. Rhee, M. Makaroun, J. Cho, R. Chaer
University of Pittsburgh Medical Center, Pittsburgh, PA

BACKGROUND: The presence of popliteal or tibial vein clot is thought to adversely affect thrombolysis for iliofemoral DVT. We aimed to examine the effect of inflow thrombosis on functional and anatomic outcomes.

METHODS: A retrospective review of 44 patients treated for symptomatic iliofemoral DVT between 2006–2009 was performed. All patients were treated by pharmacomechanical thrombectomy with local tPA with the Angiojet or Trellis device. Catheter-directed lysis and vena cava filters were used sparingly. Univariate and multi-variate logistic regression analyses were used.

RESULTS: 44 patients with mean age 52.1 ± 15.8 years presented with symptoms averaging 13.4 ± 9.9 days in duration. 20 (45.4%) had symptoms for >14 days. 39% were treated in one session but 27 patients required lytic infusion for residual thrombus. Iliac stenting was required in 49% of limbs. Successful lysis (>50%) was achieved in 91% of patients, and symptom resolution or improvement in 91%. All patients became ambulatory with no or minimal limitation. No major systemic bleeding complications occurred. Freedom from DVT recurrence and reintervention was 84% at 24 months by life table analysis. On preoperative ultrasound 89% had popliteal and tibial clot and were treated by accessing a thrombosed popliteal vein. Only one patient required simultaneous tibial lysis. At a mean follow up of 8.7 ± 6.3 months, 41 (93%) of patients had no symptom recurrence (Figure), 82% had preserved valve function and no reflux on duplex, with a mean CEAP class of 1.4. The presence of inflow thrombus had no adverse effect on symptom relief, treatment duration, patency,



CEAP class, or valve reflux. Interestingly, 90% of patients with initial popliteal thrombus had a patent popliteal vein on post-lysis ultrasound, and the presence of tibial thrombus on presentation was predictive of symptom relief with thrombolysis (OR 13.03, 95% CI 1.02–165.58, P = 0.048).

CONCLUSIONS: Inflow thrombosis is common and does not preclude successful thrombolysis of iliofemoral DVT. Valve function is preserved on midterm follow up with maintained CEAP class and symptom relief.

1:35 PM – 1:55 PM **2. Objective Outcome Measures of Patients with Iliofemoral DVT Treated with Catheter-Directed Thrombolysis**

N.K. Grewal[1], J. Trabal Martinez[1], L. Andrews[1], Z. Assi[2], S. Kasanjian[2], A.J. Comerota[1]
[1]Jobst Vascular Center, The Toledo Hospital, Toledo, OH; [2]Interventional Radiology, The Toledo Hospital, Toledo, OH

BACKGROUND: It has been suggested that elimination of thrombus in patients with iliofemoral deep venous thrombosis (DVT) may reduce the risk of the post-thrombotic syndrome (PTS). The purpose of this study is to provide objective follow-up in patients treated with pharmacomechanical thrombolysis or catheter-directed thrombolysis for extensive lower extremity DVT.

METHODS: Patients with iliofemoral DVT who underwent catheter-directed or pharmacomechanical thrombolysis were followed and assessed for signs and symptoms of PTS using validated outcome measures. The measures used were the CEAP clinical classification, the Villalta score, and the Venous Clinical Severity Score (VCSS).

RESULTS: Forty-eight patients underwent catheter-based treatment for iliofemoral DVT, 21 with catheter-directed thrombolysis and 27 with pharmacomechanical lysis. The average patient age was 46 years (range 16–78). Mean percentage of clot lysis as determined by pre- and post-procedural venography was 76%, and follow-up averaged 21.3 months. Mean clinical class of CEAP and VCSS and Villalta scores were 2, 3, and 4, respectively. Complications of thrombolysis included one acute renal failure and two major hematomas. No intracranial bleed or symptomatic pulmonary embolism occurred.

CONCLUSION: Patients with iliofemoral DVT who underwent catheter-based thrombolytic techniques to eliminate thrombus demonstrated good technical results based upon percentage clot lysis. This resulted in overall good clinical scores based on the CEAP, VCSS, and Villalta validated scoring systems. PTS was avoided as defined by the Villalta score. Based upon these observations, a successful strategy of catheter-directed thrombolysis will likely prevent the development of PTS or substantially reduce its severity.

1:55 PM – 2:15 PM **3. Anticoagulation Monitoring By an Anticoagulation Service Is More Cost-Effective Than Routine Physician Care**

F. Aziz, M. Corder, A.J. Comerota
Jobst Vascular Center, The Toledo Hospital, Toledo, OH

BACKGROUND: Vitamin K antagonists (VKA) are the mainstay of long-term anticoagulation but require careful monitoring for effectiveness and safety. Most patients are treated by physicians, although anticoagulation services are becoming increasingly popular. A new anticoagulation service (AS) run by nurses and overseen by a physician was established and its effectiveness versus usual physician care was independently assessed by the insurance carrier. We report the independent analysis of anticoagulation morbidity reflected by emergency room (ER) visits and hospitalizations observed by these two paradigms of VKA monitoring.

METHODS: An independent analysis of ER visits and hospitalizations as a consequence of anticoagulation for 2,397 patients receiving VKA between July 1, 2008 and December 31, 2008 was performed. 2,266 patients were monitored by physicians and 133 by the newly formed AS. The average cost of ER visits and hospitalizations was calculated for each patient cohort. The expense of each amortized for a 12-month period to determine an annual cost of anticoagulation morbidity per hundred patients treated.

RESULTS:

Table: Six-Month Data for ER Visits and Hospitalizations Related to Anticoagulation

	MD Monitored	AS Monitored	Total
Number of patients evaluated (%)	2266 (94.5)	131 (5.5)	2397
ER data			
Number of visits (%)	247 (10.9)	2 (1.5)	249 (12.4)
Cost per visit	$288.00	$139.00	
Cost per patient treated	$31.00	$2.00	
Savings per patient treated by AS			$29.00
Annual savings per 100 patients treated by AS			$5,800.00
Hospitalization data			
Number of hospitalizations (%)	289 (12.8)	3 (2.3)	292 (15.1)
Cost per hospitalization	$15,125.00	$17,794.00	
Cost per patient treated	$1,929.00	$407.00	
Savings per patient treated by AS			$1,522.00
Annual savings per 100 patients treated by AS			$304,400.00
Total annual savings per 100 patients treated by AS			$310,200.00

CONCLUSION: Management of long-term VKA therapy by an anticoagulation service with established protocols reduces anticoagulation morbidity, resulting in significant cost savings by reducing the number of ER visits and hospitalizations.

2:15 PM – 2:35 PM **4. Magnetic Resonance T1-Mapping Quantifies the Organisation of Resolving Venous Thrombi**

P. Saha, U. Blume, A. Wiethoff, G. Varma, D. Eastham, M. Waltham, T. Schaeffter, A. Patel, A. Ahmad, C. Evans, B. Modarai, A. Smith
King's College London, London, United Kingdom

BACKGROUND: Current imaging modalities are unable to accurately assess the degree of organisation in venous thrombi. We use a mouse model of thrombosis to optimise and validate a novel magnetic resonance (MR) imaging protocol for the quantification of organisation during venous thrombus resolution.

METHODS: An MR T1-relaxation mapping sequence was used to image venous thrombi in male BALB/C mice (n = 30). T1-relaxation times were quantified after 7, 10, 14, 21 and 28 days, using MATLAB and OsiriX analysis of Par-Rec and DICOM data sets. Thrombus was harvested and processed for histology after imaging from groups of mice at each time interval (n = 3/group). Sections, obtained from at least 10 defined intervals throughout the thrombus, were stained for markers of organisation, including: red cell and collagen content (MSB); and haemosiderin content (Perl's stain). Three-blinded observers used image analysis to calculate the percentage area of thrombus containing stain and correlated these with the T1-relaxation times of the corresponding MR scan slices.

RESULTS: The mean T1-relaxation time of the thrombus proportionally increased with time (Figure 1). Stronger correlations were observed between mean T1-relaxation time of the thrombi and collagen (Figure 2) or haemosiderin content (R2 = 0.72, P < 0.0001). The red cell content of thrombi had a weaker, but significant correlation with T1-times (R2 = 0.41, P = 0.01).

Figure 1: T1 Relaxation during thrombus resolution

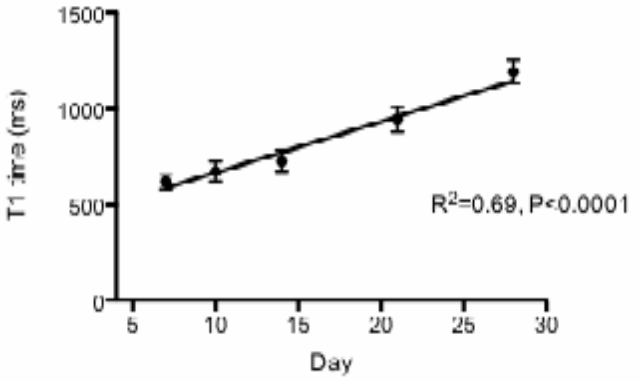
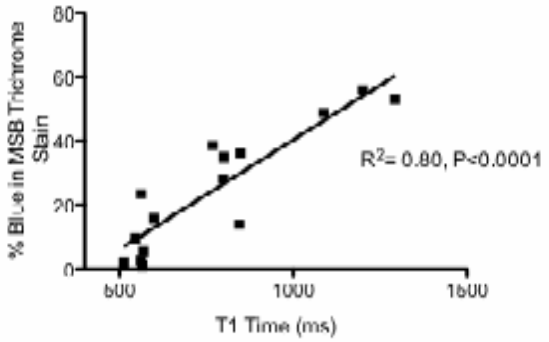


Figure 2: Mean T1 Relaxation and Collagen Content of Venous Thrombi



CONCLUSIONS: MR T1-relaxation mapping can be used as a non-invasive method for the longitudinal quantification of thrombus organisation and requires no contrast. This technique could be used to predict clinical outcome following deep vein thrombosis; guide management; and assess the efficacy of treatments in both pre-clinical and clinical settings.

2:35 PM – 2:55 PM **5. The Controversy of Managing Calf Vein Thrombosis: A Systematic Review**

E.M. Masuda[1], F. Liquido[1], Q. He[2]
[1]*Straub Clinic & Hospital, Honolulu, HI;*
[2]*Pacific Health Research Institute, Honolulu, HI*

BACKGROUND: The lack of evidence-based data regarding the optimal treatment of calf deep vein thrombosis (C-DVT) has resulted in controversy as to whether all C-DVT should be treated with anticoagulation or observed with duplex surveillance. The studies published have reported highly variable statistics on pulmonary emboli rates associated with C-DVT and clot propagation to the popliteal vein or higher. As a result, this analysis was undertaken to determine the incidence of these events associated with C-DVT.

METHODS: A total of 1,460 articles were reviewed that were published from 1975 to 2009 using computerized database searches of Pub Med, Cochrane Controlled Trials Register, and extensive cross references. The quality of the papers were reviewed by two investigators (EM, FL) and papers underwent strict selection based on specific inclusion and exclusion criteria. Studies were required to have clear definitions of C-DVT including involvement of muscular (soleal, gastrocnemius) and/or axial veins (peroneal, posterior tibial, peroneal) but not involving the popliteal vein, clearly defined inception cohort, design by randomized controlled trial (RCT) or prospective trial, serial surveillance by either duplex ultrasound scanning or radionuclide testing supplemented by venography. Only English-language papers were reviewed in this study.

RESULTS: Of the 1460 citations reviewed, there were 14 relevant English-language papers that met the selection criteria: 3 randomized controlled trials (RCT) and 11 prospective observational cohort studies. There were no RCT's designed to compare anticoagulation to observation with duplex scan surveillance. All 3 RCT's had varied regimens of anticoagulation dosing and duration. Pulmonary emboli (PE) during presentation was reported up to 33%, whereas PE during surveillance in the pooled data analysis was 3.5%, including those treated and untreated. Propagation to the popliteal vein or higher tended to be greater in those groups not treated with anticoagulation as opposed to those treated with anticoagulation.

CONCLUSIONS:. As opposed to PE at presentation, the incidence of PE during surveillance of C-DVT is low. The risk of propagation to the popliteal vein or higher that must be considered in determining optimal treatment. Clearly scientific evidence guiding treatment is lacking and RCT's comparing anticoagulation against duplex ultrasound surveillance are needed to determine the best approach.

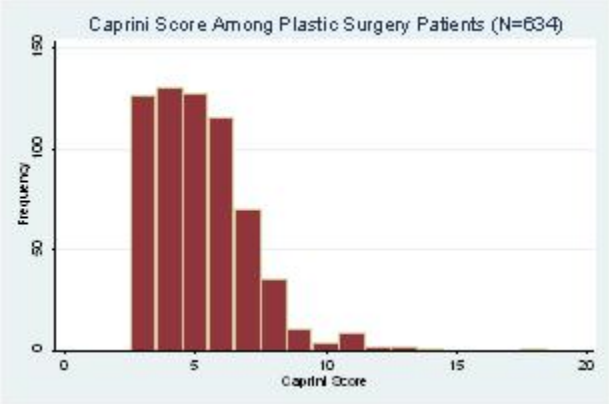
2:55 PM – 3:15 PM **6. Validation of the Caprini Risk Assessment Model in Plastic and Reconstructive Surgery Patients**

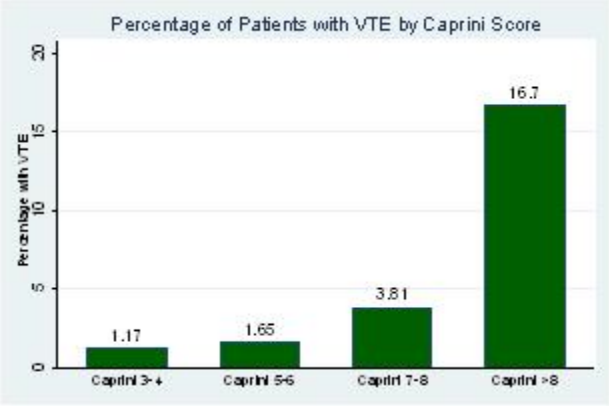
C.J. Pannucci[1], S. Bailey[2], C. Fisher[3], J. Clavijo-Alvarez[3], J. Hamill[4], K. Hume[4], T. Wakefield[1], J. Rubin[3], E. Wilkins[1], R. Hoxworth[2]
[1]University of Michigan, Ann Arbor, MI; [2]University of Texas-Southwestern, Dallas, TX; [3]University of Pittsburgh, Pittsburgh, PA; [4]American Society of Plastic Surgeons, Arlington Heights, IL

BACKGROUND: In contrast to other surgical subspecialties, the plastic surgery literature demonstrates a paucity of research regarding the efficacy of chemoprophylaxis in venous thromboembolism (VTE) prevention. As a result, we created a consortium of three tertiary referral centers with demonstrated expertise in plastic and reconstructive surgery to perform a prospective cohort study with historic controls to examine the efficacy of low molecular weight heparin prophylaxis for VTE prevention in plastic surgery patients.

METHODS: A mid-term analysis of the study's control group was conducted to evaluate the incidence of VTE when chemoprophylaxis is not provided and to validate the predictive ability of the Caprini Risk Assessment Model (RAM) for VTE. Medical record review for patients undergoing plastic surgery between March 2006 and June 2008 was conducted. All patients with Caprini scores ≥3 having surgery under general anesthesia with post-operative hospital admission were included. Patients who received any form of chemoprophylaxis were excluded. Outcomes of interest included symptomatic DVT or PE (confirmed with imaging) within the first 60 post-operative days.

RESULTS: At present, 634 patients meeting inclusion criteria have been identified. Mean Caprini score was 5.3. VTE occurred in 16 patients (2.52%; 8 DVT, 4 PE, 4 DVT + PE) with 25% of VTE occurring between post-operative day 30 and 60. When compared to those with Caprini scores of 3–4, patients with Caprini scores of 5–6 (OR 1.41, $p = .654$) and Caprini scores of 7–8 (OR 3.34, $p = .119$) were more likely to develop VTE. Patients with Caprini scores >8 were significantly more likely to develop VTE when compared to those with Caprini scores of 3–4 (OR 16.87, $p < .001$), Caprini scores of 5–6 (OR 11.95, $p < .001$), and Caprini scores of 7–8 (OR 5.05, $p = .022$). Based on preoperative risk factors, the Caprini RAM categorized 81% (13/16) patients who eventually developed VTE as "highest risk". The Caprini RAM has good discrimination for VTE in this patient population (c-statistic = 0.679).





CONCLUSIONS: Plastic and reconstructive surgery patients are at notable risk for perioperative VTE and the Caprini RAM demonstrates acceptable validity in identifying those patients at greatest risk. Patients with a Caprini score >8 are at significantly increased risk to develop VTE. A separate "maximum" risk level may be warranted for these patients in future RAMs.

3:15 PM – 3:25 PM **VENOUS FORUM OF THE ROYAL SOCIETY OF MEDICINE** *(Best Paper)*

Post-Procedure Pain, Safety and Efficacy Following Great Saphenous Vein (GSV) Endovenous Laser Ablation (EVLA) Using a 1470 nm Diode Laser

Anna Ikponmwosa[1], Rosie Darwood[1], Michael Gough[1], Michael Gaunt[2]
[1]Leeds Vascular Institute; [2]Addenbrookes Hospital, Cambridge

AIMS: EVLA abolishes GSV reflux and is an alternative to surgery for treating varicose veins. Currently lasers of 810–980 nm wavelength (peak absorption by haemoglobin) are used. Both direct vein wall contact and steam derived from intra-luminal blood may facilitate ablation. Despite its minimally invasive nature post-procedure pain was similar to that for surgery in a recent RCT. We have therefore assessed pain scores (and safety and efficacy) after GSV EVLA using a 1470 nm diode laser (energy absorption by water in vein wall 40x >haemoglobin).

METHODS: GSV ablation (ultrasound, 6 weeks), post-operative pain (100 mm linear analogue scale, days 1–7) and complications were assessed in patients treated with either an 810 nm laser (Group A: n = 29) or a 1470 nm laser (Group B: n = 22).

RESULTS: Both groups received 70J/cm laser energy (median) with complete GSV occlusion achieved in 26/29 legs (90%, Group A) and 22/22 (100%, Group B) respectively. In Group A 2/29 (7%) patients developed temporary saphenous nerve paraesthesia (resolved by 6 weeks) and 3 (10%) significant "phlebitis". No complications occurred in Group B. Median pain scores (days 1–7) were 41, 20, 19, 8, 11.5, 14.5, 15 and 1, 0.5, 0, 0, 0.5,1 for Groups A and B respectively ($P < 0.001$ for all days).

CONCLUSIONS: GSV EVLA using a 1470 nm diode laser is safe and effective. Furthermore patients experienced minimal post-procedure discomfort compared to those treated with the current generation of lasers. This may reflect more specific vein wall injury secondary to the absorption characteristics of the laser energy.

3:25 PM – 3:45 PM **Coffee Break**

3:45 PM – 5:30 PM **ASK THE EXPERTS**
VTE Management (Cases)
Moderator: Peter Henke, MD

Educational Objectives: At the conclusion of this session, the attendees will be able to:

1. Integrate risk factor assessment and best prophylaxis practices.
2. Define the new anticoagulants and mechanisms of actions.
3. Describe the therapies for unusual and difficult patient DVT prevention and treatment.

Risk Assessment and Prophylaxis—Up to Date
Peter Henke, MD

VTE Treatment and New Anticoagulants—Up to Date
Thomas W. Wakefield, MD

Unusual Situations (TOS, Calf Vein Thrombi, When Not to Anticoagulate)
Joseph A. Caprini, MD

6:00 PM – 7:30 PM **WELCOME RECEPTION**

NOTES

THURSDAY, FEBRUARY 11, 2010

7:00 AM – 8:00 AM **Continental Breakfast — Exhibits Open**

8:00 AM – 10:00 AM **SCIENTIFIC SESSION II**
Chronic Venous Insufficiency
Moderators: *Mark D. Iafrati, MD*
Robert B. McLafferty, MD

Educational Objectives: At the conclusion of this session, participants will be able to:

1. Understand the pathophysiology of CVI.
2. Review clinical paradigms surrounding the care of venous insufficiency.
3. Overview the epidemiology of chronic insufficiency.

8:00 AM – 8:20 AM **7. Healing of Venous Leg Ulcers Is Impaired in Carriers of the Hemochromatosis SNP HFE H63D When Leg Compression Is Performed with High Instead of Moderate Strength Compression**

W. Blaettler[1], B.O. Eugenio[2], F. Amsler[3]
[1]Clinical and Interventional Angiology, University Hospital Bern, Switzerland; [2]Groupo Internacional de la Compresion, Buenos Aires, Argentina; [3]Amslerconsulting, Biel-Benken, Switzerland, Switzerland

BACKGROUND: Chronic venous hypertension causes skin damage. External leg compression, therefore, is the logic treatment. In venous ulceration, however, secondary phenomena, e.g., chronic inflammation caused by iron overload and toxicity, may attain a crucial role and render high pressure bandaging unfavorable.

METHODS: Assessment of eventual associations between patient characteristics, ulcer features, and strength of compression and success of healing with the intention to identify risk factors which might ask for treatment modification.

RESULTS: Data were gathered from 99 patients taking part in trials comparing various types of compression. Patients were grouped according to compression strength measured in representative subsets. The moderate compression group included 41 patients (all treated with stockings exerting 15–30 mmHg to the ulcer area), the high strength group 58 patients (9 treated with stockings ≥35 mmHg, 49 with bandages ≥40 mmHg). Significant associations ($p < .05$)

were identified between potential risk factors and non-healing or healing within 90 days, respectively: patient age (66 vs 57yrs), BMI (30 vs 33kg/m^2), presence of hemochromatosis SNP *HFE* H63D (38 vs 19%), SNP of coagulation factor *FXIII* V34L (56 vs 35%), deep venous reflux (50 vs 26%), time of ulcer presence (42 vs 11mos), and ulcer surface 27 vs 4.5 cm^2). Sex, recurrent ulcer, edema and pain and strength of compression showed no association with healing. Upon multivariate analysis patient age, time of ulcer presence, and size remained the only significant determinants of non-healing ($p = .018$, .037, and <.001, respectively). Two-way ANOVA of compression and risk factors showed an interaction effect between compression and *HFE* H63D: ulcer healing was poor in carriers of *HFE* H63D (prevalence 29%) treated with high strength compression (2 of 15; 13%) as compared with carriers treated with moderate strength and wild type patients treated with either strength of compression (42 of 84; 50%; $p = .008$).

CONCLUSIONS: Of the many factors connected with poor healing of venous leg ulcers only one emerged as possibly relevant for treatment: carriers of the SNP *HFE* H63D are at high risk of non-healing when treatment is performed with high instead of moderate strength compression. The finding is of particular importance as the prevalence of this genetic variant is high in ulcer patients.

8:20 AM – 8:40 AM **8. Incidence of and Risk Factors for Ilio-Caval Venous Obstruction in Patients with Chronic Venous Leg Ulcers**

W. Marston, D. Fish, B. Keagy
University of North Carolina, Chapel Hill, NC

BACKGROUND: Ilio-caval venous obstruction (ICVO) can be a significant contributor to venous hypertension in patients with advanced disease. Percutaneous stenting has been reported to correct ICVO, resulting in improvement in pain, swelling and other venous symptoms. The incidence of ICVO in patients with CEAP clinical class 5 and 6 disease has not been reported. In this study, we reviewed a series of patients with healed or active venous leg ulcers to determine the incidence of ICVO and the risk factors related to its occurrence.

METHODS: Patients with CEAP clinical class 5 and 6 venous insufficiency underwent routine evaluation with duplex ultrasound to identify the presence of venous reflux in the deep and superficial systems. CT or MR venography was performed in all patients. Each study was evaluated by 2 separate examiners to determine the percentage of obstruction in the ilio-caval outflow tract. Demographics and risk factors related to venous disease were collected and examined for their association with the presence of ICVO.

RESULTS: A total of 78 CEAP clinical class 5 and 6 patients evaluated with either a CT or MR venogram were retrospectively reviewed. The average patient age was 59.3 years and 53.4% were male. The ulcer affected the left lower extremity in 46% of cases and 50% of patients reported a prior history of DVT. Duplex ultrasonography identified deep venous reflux (DVR) only in 13% of ulcerated limbs, superficial venous reflux (SVR) only in 38%, and combined DVR and SVR in 49% of limbs. The incidence of iliac and/or IVC obstruction is listed in Table 1. Overall, 37% of imaging studies demonstrated ICVO of at least 50%. Risk factors that were found to be associated with a significantly higher incidence of >80% narrowing of the iliocaval outflow tract included a prior history of DVT ($p = .005$) and reflux in the deep venous system ($p = .002$). No limb with SVR alone was found to have ICVO >80%. Although high grade ICVO occurred more frequently in females and in patients with left leg ulcers, the frequency in these cases did not reach statistical significance.

Table: Incidence of Iliocaval Stenosis in All Cases and in Limbs with Prior DVT or DVR

Degree of Iliocaval Stenosis	% of Total Cases	History of DVT	Deep Venous Reflux
100%	8.8%	17.2%	18.3%
80–99%	14%	20.7%	21.5%
50–79%	14%	13.8%	12.3%
30–49%	5.3%	3.4%	5.1%
10–29%	17.5%	13.8%	11.8%
<10%	42.1%	31%	30.8%

CONCLUSIONS: ICVO is a frequent and underappreciated contributor to venous hypertension in patients with venous leg ulcers. Patients with a history of DVT or duplex diagnosed DVR have a higher incidence of outflow obstruction and should be routinely studied with CT or MR venography to allow correction in this high-risk group of patients.

8:40 AM – 9:00 AM **9. Stenting for Iliac Veins Post-Thrombotic Obstructive Lesions: Results of a Multicentric Retrospective Study**

O. Hartung[1], M. Lugli[2], P. Nicolini[3], M. Boufi[1], O. Maleti[2], Y.S. Alimi[1]
[1]CHU Nord, Marseille, France; [2]Hesperia Hospital, Modena, Italy; [3]Clinique du Grand Large, Lyon, France

BACKGROUND: Stenting was recognized as the method of choice for treatment of femoro-iliac veins obstructive disease. We report the experience of three European centers in the endovascular treatment of post-thrombotic obstructive lesions which are recognized as the most challenging.

METHODS: From January 1996 to July 2009, 130 limbs in 109 consecutive patients (66 women, median age 44 years, thrombophylia 28 patients) were admitted for endovascular treatment of non malignant post DVT iliac veins obstructive disease. Limbs were classified CEAP C1 in 1 limb, C2 in 1, C3 in 42, C4 in 28, C5 in 11 and C6 in 47. All patients were symptomatic and disabled despite medical treatment including 49 with venous claudication. Median delay since DVT was 12 years. Lesions were bilateral in 21 cases. The IVC and the common femoral vein were involved in 21 and 33 cases. Moreover 80 limbs (61%) had at least one occluded venous segment. 4 IVC filters and 2 IVC clip were in place. The endovascular procedure was performed through percutaneous access of the femoral vein. Recanalization was performed when needed then self-expanding stents were deployed.

RESULTS: 63 patients had general anesthesia and 46 local anesthesia associated to sedation in 44 cases. In 22 limbs (15 patients), recanalisation failed and the procedure was stopped. Moreover in 3 limbs, recanalisation failed but the ipsilateral ascending lumbar vein was stented. 181 stents were deployed to treat 149 venous segments. One IVC clip was removed. No perioperative death nor pulmonary embolism occurred but one SFA tear was treated with a stentgraft. Postoperative complications included 4 early rethrombosis (3 had left iliac vein recanalization with common femoral vein involvement and 3 were successfully treated by venous thrombectomy), one right hemothorax and 2 haematomas. Median length of stay was 3 days (1–14). During a median 27 months follow-up (1–157), 1 patient died at 18 months, 4 symptomatic restenosis needed iterative endovascular procedure and 5 late rethrombosis were diagnosed (2 had successful venous thrombectomy). Moreover one patient had controlateral femoro-iliac DVT successfully treated by venous thrombectomy. Primary, assisted primary and secondary patency rates in intention to treat were respectively 76%, 77% and 80% at 1 year and 66%, 70% and 77% at 5 and 10 years (90%, 91% and 93% at 1 year and 77%, 82% and 86% at 10 years in case of technical success). All C6 limbs but 2 had healed at the end of the follow-up.

CONCLUSIONS: Late results confirm that stenting is a safe and effective technique but also a durable way to treat iliac veins post-thrombotic obstructive disease.

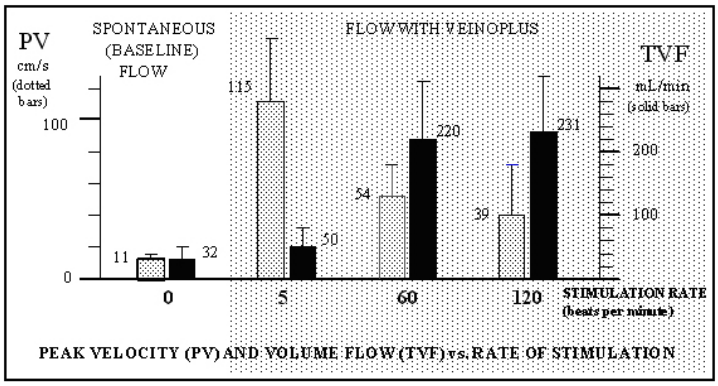
9:00 AM – 9:20 AM **10. The Efficacy of New VEINOPLUS® Stimulation Technology to Increase Venous Flow and Prevent Venous Stasis**

M.B. Griffin[1], A.N. Nicolaides[1], D. Bond[1], G. Geroulakos[2], E. Kalodiki[2]
[1]The Vascular Noninvasive Screening and Diagnostic Centre, London, United Kingdom; [2]Ealing NHS Trust Hospital, London, United Kingdom

BACKGROUND: Electro-stimulation of calf muscles has been shown to be effective in prevention of DVT. Nevertheless, the stimulation rates needed to obtain optimal hemodynamic effects for preventing venous stasis have not yet been investigated. The aim of this study was to determine: (a) dependence of venous blood velocity and ejected volume on the rates of stimulated calf contractions and (b) clinical factors that affect efficacy.

METHODS: The maximum intensity stimulus that can be tolerated comfortably, was applied to calves of 12 normal volunteers. In popliteal veins, Peak Velocities (**PV**) and Total Volume Flow (**TVF**) of expelled blood were determined using duplex-Doppler. Eleven stimulation rates: 2, 3, 4, 6, 7.5, 10, 15, 20, 30, 60 and 120 beats per minute **(**b.p.m.) were applied using FDA-and CE-registered Veinoplus devices.

RESULTS: PV decreased and TVF increased with increasing rate of stimulation. The mean and 95% CI of the PV and TVF measurements obtained at 5, 60 and 120 b.p.m. are shown on the graph below:



The rates of stimulation resulting in highest mean **TVF** were 60 and 120 b.p.m. They showed an increase of **TVF** equal to **7x** baseline. In addition, there were simultaneous increases of mean PV equal to **5x** baseline at a rate of 60 and **4x** baseline at a rate of 120. The stimulation rate of 5 b.p.m. produced highest

mean **PV** of **11x** baseline, yet it resulted in only a small increase of mean **TVF** (<**2x** baseline). The **PSV** and **TVF** were approximately 40% lower in females. They were also 30% lower in subjects older than >50 years, those with calf circumference 37 cm and/or in those with popliteal vein diameter <0.87 cm. Using logistic regression with PSV as the dependent variable, the following clinical factors remained significant: rate ($p < 0.001$), age ($p < 0.001$), gender ($p < 0.001$), calf circumference ($p < 0.003$), and popliteal vein lumen diameter ($p < 0.005$).

CONCLUSION: Veinoplus stimulation is an effective method of activating the calf muscle pump. The enhancements of popliteal blood velocity and volume flow, as shown by this study, are key factors in the prevention of venous stasis and DVT. Further studies are justified to determine the rates and configurations of stimulation, which are applicable in presence or absence of clinical factors and venous reflux, which influence calf pump output.

9:20 AM – 9:40 AM **11. Period Prevalence of Iliofemoral Venous Occlusive Disease By Doppler Ultrasound and Corresponding Treatment in a Tertiary Care Facility**

P.R. Crisostomo, J. Cho, B. Feliciano, J. Klein, D. Jones, M.C. Dalsing
Indiana University, Indianapolis, IN

BACKGROUND: Patients with iliofemoral DVT are at highest risk for postthrombotic morbidity including the post-thrombotic syndrome. Invasive therapies such as catheter directed thrombolysis (CDL), thrombectomy with or without balloon angioplasty and stenting improves venous patency, venous valve function, and quality of life in patients with acute iliofemoral DVT. What is the current prevalence of acute iliofemoral DVT and how aggressively is it being treated? We hypothesize that the 10 year period prevalence of iliofemoral DVT among acute DVT cases is greater than previously reported. Further, we hypothesize that thrombus removal to treat acute iliofemoral DVT is little utilized in current practice.

METHODS: Indiana University (IU) Vascular laboratory records from Jan 1, 1998 to Dec 31, 2008 were searched by CPT code for venous doppler ultrasound study (n = 7240). A random sample based on the IU medical record number of lower extremity doppler studies was then selected (n = 750) for retrospective chart review. Corresponding clinical information was gathered from the patients' electronic medical record in Cerner PowerChart.

RESULTS: Acute DVT occurred in 7.3%, and chronic DVT in 9.7% of patients studied (24.0% inpatient, 60.9% female, mean age 56.3 years [range, 4–91 years, 1.1% less than 16 years]). History of previous DVT (74.0%) and smoking (38.0%) were the most common risk factors in patients with DVT. Iliac DVT was identified in 9.6% of acute DVT and 5.7% of chronic DVT. Common femoral DVT was identified in 30.8% of acute DVT and 22.9% of chronic DVT. CDL was utilized in 14.3% and thrombectomy in 4.8% of acute iliac/common femoral DVT and was never used with distal DVT. Warfarin anticoagulation ±heparin/enoxaparin overlap was the most common treatment for acute (58.5%) and chronic (48.6%) iliac/common femoral DVT. In 2008, the referral base of our laboratory increased significantly. Acute DVT occurred significantly less often during the 1 year period 2008 (5.3%) than the 10 year period 1998–2007 (7.6%), but iliac/common femoral DVT as a component of acute DVT did not differ significantly (40.0% in 2008, 41.9% in 1998–2007).

CONCLUSIONS: Iliac/common femoral DVT affects almost half of patients with acute DVT. Current recommendations of acute thrombus removal for the treatment of iliofemoral DVT is underutilized suggesting that perhaps greater education of clinicians and patients regarding invasive therapy for iliofemoral DVT is necessary.

MINI PRESENTATIONS

9:40 AM – 9:45 AM **M1. Influence of the Location and the Volume of Varicose Vein on Recurrence After Phlebectomy with Preservation of a Refluxing Great Saphenous Vein**

P. Pittaluga, S. Chastanet, T. Locret
Riviera Veine Institut, Nice, France

BACKGROUND: The aim of this study is to evaluate the influence of the preoperative location and volume of varicose vein (VV) on the postoperative VV recurrence (VR) after isolated phlebectomy with preservation of a refluxing great saphenous vein (GSV).

METHODS: Retrospective study reviewing all patients operated on by phlebectomy with preservation of a refluxing GSV between January 2003 and December 2007. The location of the origin of the VV on the lower limb (LL) was catagorized as following: thigh (T), thigh + calf (T + C), upper third of the calf (UPC), lower third of the calf (LWC), multiple on the calf (MPC). The volume of the VV has been evaluated regarding the number of zones treated by phlebectomy (NZT) each LL having been divided in 32 zones. The presence of a VR was defined according to the REVAS definition.

RESULTS: During the period studied we operated on a total of 1010 LLs (C0-C1 = 0%; C2 = 85.5%; C3 = 5.2%; C4-C6 = 9.2%) by isolated phlebectomy with preservation of a refluxing GSV, in 680 patients (509 women and 171 men) aged between 19 and 93 (mean age 56.1). We have reviewed 786 LLs in 529 patients with a mean follow-up of 36.6 months (12 to 76 mo; median 36.0 mo). During the follow-up, 90 LLs have presented a VR (Group 1), meanwhile 696 LLs were free of VR (Group 2). The comparison of the preoperative population characteritics of the two groups showed no differences (Table 1), whereas the preoperative VV location and volume showed a higher frequency of UPC and MPC, and a higher NZT in Group 2 (Table 2).

Table1: Preop Characteristics of Patients with VR (Group 1) and without VR (Group 2) During the FU

	Group 1	Group 2	P
LLs	90	696	
Preop age (mean)	51.4 y	51.7 y	NS
Preop CEAP Class C2	83.3%	85.5%	NS

Table 2: Preop VV Location and Volume in LLs with VR (Group 1) and without VR (Group 2) During the FU

	Group 1	Group 2	P
Preop VV location			
T	2.2%	19.8%	<.05
T + C	27.8%	26.1%	NS
UPC	20.0%	35.5%	<.05
LWC	3.3%	6.8%	NS
MPC	60.0%	12.8%	<.05
Preop VV volume			
NZT	9.47	7.54	<.05

CONCLUSION: After phlebectomy with preservation of a refluxing GSV, the presence of VV with multiple origins at the calf and greater VV volume were correlated with a higher frequency of VR. At the opposite, presence of VV with origin at the thigh or at the upper third of the calf were correlated to a lower frequency of VR. These correlations might be taken into account for the choice of treatment and the management of follow-up.

9:45 AM – 9:50 AM **M2. Perforating Veins: Anatomical and Functional Characterization**

A. Orrego
Centro Clínico de Especialidades Vasculares, Viña del Mar, Chile

BACKGROUND: Leg ulcers are a serious public health problem because of their prevalence, how they affect quality of life, and the high costs of their treatments and laboral absenteeism. There is a demonstrated relationship between the incompetence of the perforating veins of the leg and venous leg ulcers.

METHODS*:* Every patient who consulted the Vascular Surgeon's office from November 6, 2007 to August 31, 2009 with chronic vein illness was studied with the Duplex Scan. From the results of the High Resolution Duplex Scan, patients whose perforating veins were visualized were selected. The same Vascular Surgeon performed every Duplex Scan.

RESULTS: The study included 275 patients; 203 (73.8%) were females and 72 (26.2%) were males. The mean age was 58 years, ranging from 20 to 92 years. No difference was found between male and female patients. Patients with visible perforating veins in the right leg were 66.8% and 65.3% in left leg. In the right leg there were 180 perforating veins visualized and 49.3% were incompetent; 95.6% of the patients had 1 perforating vein; 3.6% had 2, and 0.7% had three. The mean diameter was 0,28 cm and the mean distance from the medial maleolus was 8.7 cm, localizing 68% between 6 and 10 cm. Of these 79% drained in the Posterior Arch Vein, 14.5% in the Great Saphenous Vein, and 0.7% in the Gastrocnemius Vein. In the left leg there were 180 perforating veins found and 66.7% were incompetent. 93.3% of the patients had only one perforating vein; 6% had 2, and 0.7% had three. The mean vein diameter was 0.28 cm and the mean distance from the maleolus was 8cm, localizing 61.1% between 6 and 10 cm. Of these 82.6% drained in the posterior arch vein and 17.4% in the Great Saphenous Vein.

Perforating Veins Characterization According to CEAP

	CEAP 1		CEAP 2		CEAP 3		CEAP 4		CEAP 5		CEAP 6	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Total number of peforating veins (%)	15,3	19,4	25	25,7	37,2	30,6	15,3	11,8	0	0	9,7	11,8
Incompetent Veins (%)	54,5	46,4	63,9	51,4	68	45,5	68,2	64,7	0	0	71,4	47
Mean Diameter (Cms)	0,24	0,24	0,3	0,29	0,28	0,27	0,29	0,39	0	0	0,33	0,28

CONCLUSIONS: The anatomical and functional characterization of leg perforating veins is of vital importance for understanding the ethiopathogenics of vein ulcers. It also allows us to plan for minimal invasive treatments like foam, laser, and radiofrequency to give an effective and rapid solution to a great public health problem.

9:50 AM – 9:55 AM **M3. What Is the Method of Choice for Treatment of Obesity Patients with Chronic Venous Diseases?**

S.M. Belentsov
City Cllinic Hospital #40, Yekaterinburg, Russian Federation

BACKGROUND: Obesity is a factor which makes a treatment of patients with Chronic Venous Diseases (CVD) a very difficult task. One the one hand, these patients have more chances to get complication after high flight legation and stripping. On the other hand, trophic changes progress very fast and these patients have C3–C6 class (CEAP) more often. Additionally, these patients suffer severe from elastic bandage. There are almost no publications discussing this subject.

METHODS: Prospective randomized study included 65 patients with CVD, C3–C6 class (CEAP) and body mass index (BMI) more then 30 kg/m^2. They all had incompetent Great Saphenous Vein (GSV) valves and varicose veins. The two groups were comparable in gender, age, class of CVI and GSV diameter. Main group consisted of 34 patients, who were treated with the using of Radiofrequency Ablation of GSV, Ultrasound Guided Foam Sclerotherapy of Incompetent Perforators and compression sclerotherapy of Varicose Veins. Elastic compression of thigh lasted 24 hours, patients used compression stockings. 31 patients of control group were treated by high ligation and stripping of GSV and phlebectomy of side branches. 9 of them were underwent compression sclerotherapy 2 weeks after operation. Patients of the control group used elastic bandage 2 weeks after operation and then compression stockings. Personal comfort was valued by using of Visual Analog Scale from 0 (rather comfortable) to 10 (unbelievable discomfort).

RESULTS: All the patients were released from veno-venous refluxes and Varicose Veins. There were no any complications in the first group, the value of comfort according Visual Analog Scale was 3,5 ± 2,13. There were 9 (29%) complications in the second group, the value of comfort according Visual Analog Scale was 7,3 ± 2,86 (<0,05)

CONCLUSIONS: Radiofrequency Ablation of GSV is a safe and effective method of treatment obese patients with CVD. The method is more comfortable for patients, ambulatory and could keep usual activity.

9:55 AM – 10:00 AM **National Screening Program Update: 2009**
Marc A. Passman, MD, Chairman

10:00 AM – 10:45 AM **Coffee Break**

10:45 AM – 12:45 PM **SCIENTIFIC SESSION III**

Superficial Vein Disease

Moderators: *Joseph D. Raffetto, MD*
Julianne Stoughton, MD

Educational Objectives: At the conclusion of this session, participants should be able to:

1. Understand the epidemiology of varicose veins and progression of disease in a study population.
2. Gain knowledge in the potential mechanism of varicose vein formation and how matrix metalloproteinases are related to hypoxia inducible factor and stretch.
3. Gain knowledge in the mechanism of escin and other venous modulating drugs on venous tissue tone and its implications on treatment.
4. Understand the possible theories in the development of varicose vein reflux in primary venous disease.
5. Gain information on ablation treatment for venous reflux and advanced stages of chronic venous disease and on trials using different ablative modalities.
6. Understand the implications of residual great saphenous vein on recurrent venous disease.

10:45 AM – 11:05 AM 12. Incidence of Varicose Veins, CVI and Progression of the Disease in the Bonn Vein Study II

E. Rabe[1], F. Pannier[2], A. Ko[1], G. Berboth[1], B. Hoffmann[3], S. Hertel[3]
[1]Dermatologische Universitaetsklinik, Bonn, Germany; [2]Department of Dermatology, AZM, Maastricht, Netherlands; [3]Institut für Med. Informatik, Biometrie und Epidemiologie, University of Essen, Essen, Germany

BACKGROUND: Chronic venous disorders are among the most common diseases in Germany. In the Bonn Vein Study I (BVS I), conducted in 2000, 3072 participants of the general population of the city of Bonn and two rural townships, aged 18–79 years were took part in this study (1350 men, 1722 women). Participants were selected via simple random sampling from the registries of residents. In this follow-up study 6.6 years later, the same population was investigated again to. The aim was to identify the incidence of newly developed chronic venous disorders and of progression of pre-existing CVD.

METHODS: From May 2007 to September 2008, we contacted all participants of BVS I and invited them for a reinvestigation. The participants answered a standardized questionnaire and were examined by clinical means and by duplex ultrasound in the same way as in BVS I.

RESULTS: The response at follow-up after 6.6 years was 84.6%. We reinvestigated 1978 participants. The prevalence for varicose veins rose from 22.7 to 25.1% and for CVI from 14.5 to 16%. The incidence for new varicose veins was 13.7% and for new CVI 13.0% per 6.6 years increasing with age. Participants with C-Class C2 as a maximum at BVS I increased to higher C-classes in 19.8% (nonsaphenous VV) and in 31.8% (saphenous VV).

CONCLUSIONS: These results show a high incidence of app. 2% for varicose veins and for CVI per year. In the same time the incidence of progression to higher C-classes seems to be very high.

11:05 AM – 11:25 AM 13. Prolonged Mechanical Stretch Is Associated with Upregulation of Hypoxia-Inducible Factors and Reduced Contraction in Rat Inferior Vena Cava

C.S. Lim[1], X. Qiao[2], V. Mam[3], Y. Xia[2], J.D. Raffetto[4], E. Paleolog[1], A.H. Davies[1], R.A. Khalil[2]

[1]Imperial College London, London, United Kingdom; [2]Brigham & Women's Hospital, Boston, MA, [3]Brigham & Women's Hospital, Boston, MA; [4]VA Boston HCS, West Roxbury, MA

BACKGROUND: Decreased venous tone and vein wall dilation secondary to venous hypertension may contribute to varicose vein formation. We have shown that prolonged increases in vein wall tension are associated with overexpression of matrix metalloproteases (MMPs) and increased venous relaxation. Expression of hypoxia-inducible factors (HIFs) also increases with mechanical stretch. This study aimed to assess whether upregulation of HIF is an intermediary mechanism linking the prolonged increases in vein wall tension to the changes in venous contraction and MMP expression.

METHODS: Circular segments of inferior vena cava (IVC) from male Sprague-Dawley rats were suspended between two wires in a tissue bath. IVC segments were subjected to control 0.5 g basal tension for 1 hr. After eliciting a control contraction to KCl (96 mM) and phenylephrine (PHE, 10^{-5} M), the veins were exposed to prolonged 18 hr basal tension at 0.5 g, 2 g, 2 g plus HIF inhibitor (U-0126 10^{-5} M, 17-DMAG 10^{-5} M, echinomycin 10^{-6} M), or 2 g plus DMOG (10^{-4} M), a prolyl-hydroxylase inhibitor which stabilizes HIF. The fold change in contraction to KCl or PHE after prolonged tension for 18 hr was compared to the corresponding initial contraction at 0.5 g tension for 1 hr. Vein homogenates were analyzed for HIF-1α, HIF-2α, MMP-2 and MMP-9 expression using real-time RT-PCR.

RESULTS: Compared to control IVC contraction at 0.5 g tension for 1 hr, the contraction to KCl and PHE at prolonged 0.5 g tension for 18 hr was 1.1 ± 0.06 and 2.0 ± 0.35, respectively. KCl- and PHE-induced contraction at prolonged 2 g tension was significantly reduced (0.72 ± 0.05 and 0.87 ± 0.13, respectively). KCl-induced contraction was restored in IVC exposed to prolonged 2 g tension plus the HIF inhibitor U0126 (1.14 ± 0.05) or echinomycin (1.11 ± 0.15). U0126 and echinomycin also restored PHE-induced IVC contraction after prolonged 2 g tension (1.38 ± 0.15 and 1.99 ± 0.40, respectively). Stabilization of HIF using DMOG further reduced KCl and PHE-induced contraction in veins under prolonged 2 g tension (0.57 ± 0.01 and 0.47 ± 0.06, respectively), implicating HIF in the reduced contraction associated with prolonged stretch. HIF-1α and HIF-2α mRNA expression was increased in IVC segments under prolonged 2 g tension, and reversed in IVC treated with U0126, 17-DMAG, or echinomycin. The overexpression of HIF was associated with increased MMP-2 and MMP-9 mRNA expression.

CONCLUSION: Prolonged increases in vein wall tension are associated with overexpression of HIF-1α and HIF-2α in rat IVC. The upregulation of HIF is associated with increased MMP-2 and MMP-9 expression and reduced venous contraction. The data suggest that the increased vein wall tension secondary to venous hypertension may induce HIF overexpression, and cause an increase in MMPs expression and reduction of venous contraction, leading to progressive venous dilation and varicose vein formation.

11:25 AM – 11:45 AM 14. Ca^{2+}-Dependent Venous Contraction By the Saponoside Escin in Rat Inferior Vena Cava: Implications in Venotonic Treatment of Varicose Veins

J.D. Raffetto, R.A. Khalil
Brigham and Women's Hospital, Boston, MA

BACKGROUND: Saponosides such as horse chestnut seed extract (escin) exhibit venotonic properties that have been utilized in treatment of varicose veins. Escin is known to form pores in the cell membrane, but the cellular mechanisms underlying its venotonic properties and long-term effects on venous function are unclear. Because Ca^{2+} is a major regulator of venous smooth muscle function, we tested the hypothesis that escin promotes Ca^{2+}-dependent mechanisms of venous contraction.

METHODS: Circular segments of inferior vena cava (IVC) were isolated from male Sprague-Dawley rats and suspended between two wires in a tissue bath filled with Krebs solution for measurement of isometric contraction. Following control contraction to 96 mM KCl, the effect of increasing concentrations of escin (10^{-10} to 10^{-4} M) on venous contraction was measured. To test for Ca^{2+}-independent effects, the response to increasing concentrations of escin was measured in Ca^{2+}-free (2 mM EGTA) Krebs. To test for Ca^{2+}-dependent effects, IVC segments pretreated with escin (10^{-4} M) were incubated in 0 Ca^{2+} Krebs for 5 min, then increasing extracellular $CaCl_2$ concentrations (0.1, 0.3, 0.6, 1, 2.5 mM) were added and the $[Ca^{2+}]_e$-contraction relationship was constructed. Contraction data were presented as mg/mg tissue (means ± SEM).

RESULTS: In IVC, the α-adrenergic agonist phenylephrine (PHE, 10^{-5} M) and membrane depolarization by 96 mM KCl caused significant contraction (175.4 ± 21.1 and 216.5 ± 24.2, respectively). In normal Krebs (2.5 mM Ca^{2+}), escin caused concentration-dependent contraction reaching a maximum of 115.7 ± 15.3 at 10^{-4} M. The escin-induced contraction was reversible, and after washing 3 times with Krebs, the veins returned to a relaxed state, suggesting that the escin-induced contraction is not a rigor state. In Ca^{2+}-free Krebs there was essentially no contraction in response to increasing concentrations of escin (1.9 ± 1.9 at 10^{-4} M), supporting that escin-induced contraction is not solely due to its pore forming properties, potential loss of intracellular ATP, and consequent contractile rigor. In escin-treated veins incubated in 0 Ca^{2+} Krebs, stepwise addition of extracellular $CaCl_2$ caused corresponding increases in contraction that reached a maximum of 76.9 ± 15.3 at 2.5 mM $CaCl_2$. In IVC segments, pretreated with escin (10^{-4} M) for 2 hours, PHE caused a small contraction (5.8 ± 3.6, $p < 0.001$), and KCl-induced contraction was significantly reduced (82.3 ± 14.8, $p = 0.026$).

CONCLUSION: In rat IVC, escin induces extracellular Ca^{2+}-dependent contraction that could translate into measurable venotonic effects. However, escin also disrupts -adrenergic receptor-mediated pathways and depolarization-induced Ca^{2+} entry-dependent vein contraction. Thus the initial venotonic benefits of escin may be offset by long-term disruption of venous smooth muscle response to vasoactive stimuli and thereby limit its long-term therapeutic benefit in varicose veins.

11:45 AM – 12:05 PM 15. Neither Ascending Nor Descending Theory Can Fully Explain the Pattern of Venous Reflux in Patients with Primary Chronic Venous Disease

M.I. Qureshi, A. MacDonald, L. Wing, C.S. Lim, M. Ellis, I.J. Franklin, A.H. Davies
Imperial College London, London, United Kingdom

BACKGROUND: The natural history of venous reflux in patients with chronic venous disease (CVD) remains unclear. The study aimed to assess the pattern of venous reflux on duplex ultrasonography in patients with primary CVD.

METHODS: A retrospective analysis of duplex ultrasonographic reports of patients with CVD in one institution between January 1, 2000 and August 31, 2009 was performed. Patients with secondary CVD, and limbs previously treated with open surgery, endovenous ablation and injection sclerotherapy were excluded. Patients whose scan reports contained inadequate information were also excluded. Subgroup analysis was performed to compare the pattern of venous reflux in men and women, and three age-groups (<30, 30–60, >60 years). Chi-squared test was used and $P < 0.05$ was considered significant.

RESULTS: Figure 1 summarizes the limbs that were included and excluded. Following exclusion, 3089 patients (1160 men and 1929 women; mean age 54 years; range 12–101 years) were included for analysis. Saphenofemoral junction (SFJ) reflux was demonstrated in 53% (2230/4185) of limbs; men 58% and women 51% ($P < 0.0001$). There was no significant difference noticed in the proportion of SFJ incompetence between age-groups ($P = 0.9925$). Great saphenous vein (GSV) reflux was found in 82% (3472/4223) of limbs; men 84% and women 81% ($P = 0.0072$). There was no significant difference observed in the proportion of GSV incompetence between age-groups ($P = 0.1048$). Saphenopopliteal junction (SPJ) reflux was found in 23% (956/4236) of limbs; men 22%

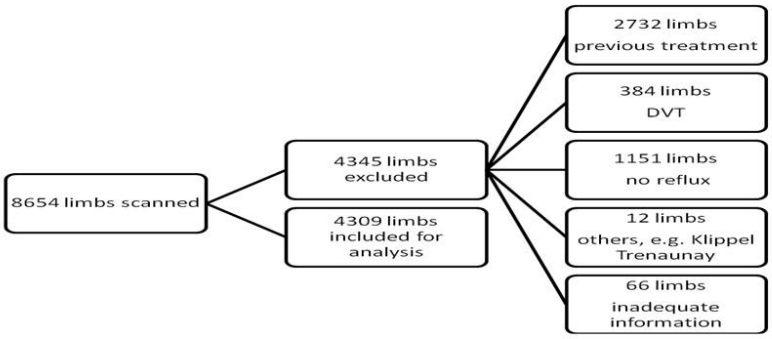


Figure 1: Inclusion and Exclusion of Limbs for Analysis

and women 23% (P = 0.7964). The percentage of SPJ incompetence was significantly different between age-groups (P = 0.0446). Small saphenous vein (SSV) incompetence was shown in 31% (1307/4200) of limbs; men 34% and women 30% (P = 0.0086). Significant difference was also noted in the proportion of SSV reflux in between age-groups (P = 0.0386). Of 676 limbs with a competent SFJ, 1318 (67%) had refluxing GSV, and 51% (785/1527) of limbs with competent GSV above the knee showed GSV reflux below the knee. Eighty-one of 1664 (5%) limbs were found to have a competent GSV above the knee despite incompetent SFJ and below knee GSV. Furthermore, 20% (655/3280) of limbs with competent SPJ demonstrated refluxing SSV.

CONCLUSIONS: Reflux does not invariably originate at junctions of patients with primary CVD. There appears to be multi-focal initiation of disease rather than following the ascending or descending theory. Some variations were observed between men and women, and in different age-groups. Such pattern of venous reflux is likely to be due to primary venous wall changes rather than primary valvular dysfunction.

12:05 PM – 12:25 PM 16. Endovenous Radiofrequency Treatment for Patients with Chronic Venous Insufficiency and Venous Ulcerations

C.J. Marrocco, M.D. Atkins, Jr., W.T. Bohannon, T.R. Warren, C.J. Buckley, R.L. Bush
Scott & White Hospital, Temple, TX

BACKGROUND: Venous ulcerations are frequently slow to heal and recurrent, causing major disability in afflicted persons. This retrospective study examines outcomes of aggressive endovenous therapy in promoting ulcer healing and/or preventing ulcer recurrence.

METHODS: In 2007 and 2008, 340 patients with venous insufficiency were treated in an academic health science center vein clinic. Medical records of 68 (18.8%) patients with severe chronic venous disease (C5: n = 43, 73%; C6: n = 25, 37%) were reviewed. Data analysis included body-mass index (BMI), history of deep vein thrombosis (DVT) or prior vein surgery, type of procedure [radiofrequency ablation (RFA) of greater saphenous vein (GSV) alone or GSV and perforator ablation (GSVP)]. Complications, ulcer healing rates, and recurrent ulcerations were examined. Descriptive statistics are reported and contingency tables used when appropriate.

RESULTS: The patients were 63 ± 16 years of age (men: n = 24, women: n = 44) with a BMI of 32.4 (range 20.8–53.4). Duplex scanning showed that all patients had GSV insufficiency and 30 (44%) had deep vein incompetence. Only 19 (28%) patients had a history of a DVT and 13 (19%) had prior vein procedures. Prior to undergoing ablation, 25 patients with C6 disease were conservatively treated with compression for an average of 5.4 months (range 1–13). Ablation alone of the GSV was performed in 49 patients (72%) and perforator ablation of the GSV was conducted in 19 patients (28%). Only 2 (2.9%) patients experienced complications. One patient had excessive hemosiderin staining; another patient had paresthesias. Of the C5 patients treated, 2 (4.7%) developed recurrent ulcerations. An appreciably greater percentage of C6 patients, 20% (n = 5), did not heal completely or developed a recurrent ulcer. The table below shows the comparison of C5 and C6 patients treated with and without the addition of perforator interruption. Prior treatment with compression, prior history of DVT and/or prior venous procedures did not impact patient outcomes.

Comparison of C5 and C6 Patients

	C5, n = 43	C6, n = 25	P value
Age (years)	61.8	66.5	NS
BMI	34.1	30.6	NS
Gender (m/f)	11/32	13/12	0.028
Deep vein insufficiency	18	13	NS
GSV/GSVP	31/12	16/9	NS
Recurrent or non-healing ulcer	2	5	0.049

CONCLUSIONS: Chronic venous insufficiency with active or healed ulceration is commonly seen in our academic health science center vein clinic. In this series, endovenous ablation allowed for excellent healing rates and acceptable recurrent ulcer rates. It is unclear from this small cohort whether the addition of perforator ablation was of benefit in improving venous hemodynamics.

12:25 PM – 12:30 PM M4. VNUS Closure FAST™ Ablation Versus Laser for Varicose Veins (VALVV): A Randomised Clinical Trial—Preliminary Results

A.C. Shepherd, M.S. Gohel, L.C. Brown, M.J. Metcalfe, M. Hamish, A.H. Davies
Imperial College, London, United Kingdom

BACKGROUND: Endovenous thermal ablation is associated with excellent technical, clinical and patient reported outcomes, although direct comparisons between modalities are scarce. The aim of this study was to compare endovenous laser ablation (EVLA) and segmental radiofrequency ablation (RFA) with respect to post-procedural pain and quality of life in the setting of a randomised clinical trial (ISRCTN66818013).

METHODS: Consecutive patients with primary great saphenous vein (GSV) reflux were screened and consenting patients were randomised to EVLA (980nm) or RFA (VNUS ClosureFAST™) at a single centre. Procedures were performed under general anaesthesia with concomitant phlebectomy, follow-up was at 1 week, 6 weeks and 6 months. The primary outcome was post-procedural pain measured using a 100mm visual analogue scale and secondary outcomes were analgesia use, quality of life (QoL) at 6 weeks (Aberdeen Varicose Vein Questionnaire [AVVQ]) and occlusion of the GSV on colour duplex at 6 months.Sample size calculations based on the primary outcome suggested that 47 patients in each group would be sufficient to detect a difference in pain scores. The planned recruitment period was 12 months and analysis was on intention to treat using linear regression, adjusted for baseline and treatment variables or analysis of co-variance (ANCOVA) as appropriate.

RESULTS: 131 patients were recruited over 12 months between July 2008 and 2009, and randomised to EVLA (n = 64) and RFA (n = 67) and baseline variables were comparable. Mean (SD) pain scores over 3 days were 26.4 mm (22.1) for RFA and 36.8 mm (22.5) for EVLA (p = 0.012). Over 10 days, mean-(SD) pain scores were 22.0 mm (19.8) versus 34.3 mm (21.1) for RFA and EVLA respectively (p = 0.001). Patients randomised to RFA used fewer analgesic tablets (mean [SD]) over 3 (8.8 [9.5] vs 14.2 [10.7]; p = 0.003) and 10 days (20.4 [22.6] vs 35.9 [29.4]; p = 0.001) compared to EVLA. Changes in AVVQ score over 6 weeks were similar between the groups; mean (SD) change of 10.0 (9.6) points improvement and 9.4 (9.0) for RFA (n = 56) and EVLA (n = 49) respectively (13 patients awaiting follow up) p = 0.991(ANCOVA). 6 month data will be complete in February 2010.

CONCLUSIONS: RFA using VNUS ClosureFAST™ is associated with less post-procedure pain and reduced analgesia use compared to EVLA (980 nm). However, improvements in disease-specific QoL were similar at 6 weeks.

12:30 PM – 12:35 PM M5. The ClariVein Catheter Trial: Final Results and Recommendations

S. Elias
Mount Sinai School of Medicine, Englewood, NJ

BACKGROUND: Currently most forms of endothermal ablation of the great (GSV) and small saphenous veins (SSV) require instillation of tumescent anesthesia and an exogenous energy source (radiofrequency or laser). These two requirements involve: some patient discomfort, additional procedure time, an operator learning curve and increased cost. A new endovenous device, ClariVein™ was evaluated that does not require tumescent anesthesia or an exogenous energy source (generator).

The ClariVein™ catheter combines two modalities: endovenous mechanical vein destruction with a rotating wire and the simultaneous infusion of a FDA approved liquid sclerosant, sodium tetradecyl sulfate to enhance venous occlusion. This mechanical-chemical ablative modality is unique. An IRB sanctioned study was conducted to evaluate the safety and efficacy of this technique.

METHODS: 30 patients with GSV incompetence were treated. CEAP class was C2 (24), C3 (2) and C4 (4). All procedures were performed in office with local anesthesia at the access site only. No tumescent anesthesia or oral sedation was used. Ultrasound guided access and post procedure evaluation was similar to existing endothermal techniques. Post procedure, patients resumed normal activity. No concomitant treatments (phlebectomy, sclerotherapy, PAPS) were performed. Post treatment compression was utilized for 14-days. Patients were studied 1week, 1month, 3months and 6months post treatment.

RESULTS: Total procedure time averaged 14 minutes with catheter ablative treatment time of 5 minutes. GSV size 2 cm from SFJ was 8.1 mm (5.5–12 mm) with an average treatment length of 36 cm.

At 1 month and 3 months, 29 of 30 patients are occluded. 10 patients have been followed for 6 months, 9 of 10 occluded. Full study 6 month results for the remaining 20 patients will be complete by December 2009. The only GSV patent is the first subject of the trial, all others are successfully ablated.

Complications consisted of thigh ecchymoses (3). No DVT, nerve, skin or deep vessel injury occurred. All patients resumed full activity the day of the procedure.

CONCLUSION: The endomechanical ablative aspect of ClariVein™ coupled with an approved liquid sclerosant accomplishes GSV occlusion without tumescent anesthesia. The elimination of this step in endovenous ablation represents a further simplification for patient and physician. Pain, discomfort and bruising are minimal.

Short-term occlusion rates are comparable to existing endothermal methods. Symptom improvement also parallels these methods. Longer follow up will continue to evaluate the durability of this technique. Theoretical advantages include: the treatment of GSV from ankle to groin and SSV without concern for endothermal nerve, skin, or vessel injury. The ClariVein™ catheter appears to be a viable treatment option for most incompetent great saphenous veins.

12:35 PM – 12:40 PM M6. The Influence of Residual Varicose Veins After GSV Stripping on Recurrence in a Long Term Follow Up

T. Ogawa, S. Hoshino
Fukushima Daiichi Hospital, Fukushima, Japan

BACKGROUND: Residual varicose veins and incompetent perforators are found even after venous stripping with stab avulsion as a radical treatment of primary great saphenous vein (GSV) varicosities. It is unclear if residual varicose veins and incompetent perforators play a role for recurrence of varicose veins in long term follow up. This aim was to study the efficiency of complete removal of varicose veins through GSV stripping and stab avulsions on the recurrence rate in long term follow up.

METHODS: 150 consecutive patients (209 legs; C2 98 legs, C3 64 legs, C4a 38 legs, C4b 6 legs, C5,6 3 legs in C classification) who underwent GSV stripping from SFJ to knee level with stab avulsions of varicose veins. Sclerotherapy was done for 10 cases and phlebectomy for 1 case with residual varicose vein 3 months postoperatively. Inspection of visible varicose vein and venous hemodynamics using duplex ultrasound and air-plethysmography (APG) were performed for all cases before and three months after surgery, and for 48 (60 legs) of 150 patients 3–5 years after surgery.

RESULTS: Residual varicose veins were found in 61 of 209 legs (29.2 %) at 3 months and 13 of 60 legs (21.7 %) at 3–5 years after surgery. Recurrent varicose veins were found in 10 of 60 legs (16.7 %), where 22.2 % were legs with residual varicose veins and 14.3 % cases with complete removal of varicose veins at 3 months follow up, respectively. Venous reflux disappeared at 3 months follow up in 3 of 15 SSV (20%), 60 of 96 perforators (62.5%) and 4 of 17 deep veins (23.5%). The reduction rate of venous reflux sites in legs with residual varicose veins was approximately 2 times lower than these with completely resolved varicose veins at three months as well as 3–5 years follow up. 9 of 10 legs with recurrent varicose vein had new venous reflux sites after operation. APG examination showed that the venous refilling index (VFI) was improved significantly afteroperation. There was no significant VFI difference at 3 months and 3–5 years follow up between the cases with completely removed or residual varicose veins at the three months follow up.

CONCLUSIONS: The case with completely removed varicose veins after GSV stripping and phlebectomy had less venous reflux sites than the case with residual varicose veins in the long term follow up. However, complete removal of varicose veins did not contribute to reduce recurrent varicose vein. One major cause of recurrent varicose vein may be not residual varicose vein itself but the appearance of new venous reflux sites.

12:45 PM – 2:00 PM **INDUSTRY ADVISORY COMMITTEE LUNCH**
(By Invitation)

2:00 PM – 4:30 PM **WORKSHOPS/SYMPOSIUMS**
(Parallel Sessions)
Note: *Workshops Repeat—Symposia Do Not*

2:00 PM – 3:00 PM

WORKSHOPS

a. Calf Vein Imaging
Gail Size, BS, RVT, RVS, FSVU

b. Reflux, Caval Occlusion (Ultrasound)
Nicos Labropoulos, MD

c. Wound Care

Bandaging
Hugo Partsch, MD

Manual Lymphatic Massage
Franz-Josef Schingale, MD

Skin Substitutes
Vincent Falanga, MD & William A. Marston, MD

d. IVUS Interpretation
David L. Gillespie, MD & Robert B. McLafferty, MD

2:00 PM – 3:00 PM

SYMPOSIUM 1

COMMUNITY PRACTICE POTPOURRI

Coding & Billing—What's New
Sean P. Roddy, MD

Preparing for New Changes in Practice Management—The Insurance Quagmire
Diana L. Neuhardt, RVT

3:15 PM – 4:15 PM

WORKSHOPS *(Repeat)*

a. Calf Vein Imaging
Gail Size, BS, RVT, RVS, FSVU

b. Reflux, Caval Occlusion (Ultrasound)
Nicos Labropoulos, MD

c. Wound Care

Bandaging
Hugo Partsch, MD

Manual Lymphatic Massage
Franz-Josef Schingale, MD

Skin Substitutes
Vincent Falanga, MD & William A. Marston, MD

d. IVUS Interpretation
David L. Gillespie, MD & Robert B. McLafferty, MD

3:15 PM – 4:15 PM

SYMPOSIUM 2

AMERICAN COLLEGE OF PHLEBOLOGY

Moderator: John Mauriello, MD

What We Know and What We Don't Know About Endovenous Thermal Ablation
Lowell Kabnick, MD

What Nerves Are Important When Treating Leg Veins
John Mauriello, MD

Can Nerve Damage Be Avoided During Endovenous Thermal Ablation
Ted King, MD

Missed and Misinformation on Duplex Examination
Joseph Zygmunt, Jr., RVT

Perforator Veins: Anatomy Guiding Therapy
Michael Vasquez, MD

4:30 PM – 6:30 PM **POSTER SESSION**
Wine & Cheese Reception

NOTES

FRIDAY, FEBRUARY 12, 2010

7:00 AM – 7:30 AM **Continental Breakfast — Exhibits Open**

7:30 AM – 8:50 AM **SCIENTIFIC SESSION IV**
Multi-Topic
Moderators: *Michael A. Vasquez, MD*
M. Ashraf Mansour, MD

Educational Objective: At the conclusion of the session, participants should have a better understanding of:

1. The relationship of the Venous Clinical Severity Score to other venous assessment tools in a general venous screening population.
2. Thromboembolic complications following Inferior Vena Cava penetrating injuries.
3. Treatment options for chronic cerebrospinal venous insufficiency in Multiple Sclerosis.

7:30 AM – 7:50 AM **17. Validation of Venous Clinical Severity Score (VCSS) with Other Venous Severity Assessment Tools: Analysis from the National Venous Screening Program**

M.A. Passman[1], R.B. McLafferty[2], M.F. Lentz[3], S.B. Nagre[1], M.D. Iafrati[4], W.T. Bohannon[5], C.M. Moore[2], J.A. Heller[6], J.R. Schneider[7], J.M. Lohr[8], J.A. Caprini[9]
[1]University of Alabama at Birmingham, Birmingham, AL; [2]Southern Illinois University, Springfield, IL, [3]National Venous Screening Program, Baltimore, MD; [4]Tufts University, Boston, MA; [5]Scott & White, Temple, TX; [6]Johns Hopkins University, Baltimore, MD; [7]Central Dupage Hospital, Winfield, IL; [8]Lohr Surgical Specialists, Cincinnati, OH; [9]Evanston Hospital, Evanston, IL

BACKGROUND: With the expansion of the American Venous Forum (AVF), National Venous Screening Program (NVSP) in 2007, several standard venous assessment tools were incorporated into the screening process as independent determinants of venous disease severity, but correlation between these instruments has not been tested. The scope of this study is to assess the validity of venous clinical severity scoring (VCSS) and it integration with other venous assessment tools as a global venous screening instrument.

METHODS: NVSP data registry over the past 2 years was queried for participants with complete datasets including CEAP clinical staging, VCSS, modified CIVIQ quality of life (QOL) assessment, and venous ultrasound results. Statistical correlation trends were analyzed using Spearman's rank coefficient as related to VCSS.

RESULTS: 5,814 limbs in 2,907 participants were screened and included CEAP clinical stage C0: 26%; C1: 33%; C2: 24%; C3: 9%; C4: 7%; C5: 0.5%; C6: 0.2% (mean 1.41 ± 1.22). VCSS mean score distribution (range 0–3) for the entire cohort included: pain 1.01 ± 0.80, varicose veins 0.61 ± 0.84, edema 0.61 ± 0.81, pigmentation 0.15 ± 0.47, inflammation 0.07 ± 0.33, induration 0.04 ± 0.27, ulcer number 0.004 ± 0.081, ulcer size 0.007 ± 0.112, ulcer duration 0.007 ± 0.134, and compression 0.30 ± 0.81. Overall correlation between CEAP and VCSS was moderately strong ($r_s = 0.49$ $p < 0.0001$), with highest correlation for attributes reflecting more advanced disease including varicose vein ($r_s = 0.51$ $p < 0.0001$), pigmentation ($r_s = 0.39$ $p < 0.0001$), inflammation ($r_s = 0.28$ $p < 0.0001$), induration ($r_s = 0.22$ $p < 0.0001$), and edema ($r_s = 0.21$ $p < 0.0001$). Based on the modified CIVIQ assessment, overall mean score for each general category included: QOL-Pain 6.04 ± 3.12 (range 3–15), QOL-Functional 9.90 ± 5.32 (range 5–25), and QOL-Social 5.41 ± 3.09 (range 3–15). Overall correlation between CIVIQ and VCSS was moderately strong ($r_s = 0.43$ $p < 0.0001$), with highest correlation noted for pain ($r_s = 0.55$ $p < 0.0001$) and edema ($r_s = 0.30$ $p < 0.0001$). Based on screening venous ultrasound results, 38% of limbs had reflux and 2% obstruction in the femoral, saphenous or popliteal vein segments. Correlation between overall venous ultrasound findings (reflux + obstruction) and VCSS was slightly positive ($r_s = 0.23$ $p < 0.0001$), but was highest for varicose vein ($r_s = 0.32$ $p < 0.0001$), and showed no correlation to swelling ($r_s = 0.06$ $p < 0.0001$) and pain ($r_s = 0.003$ $p < 0.0001$).

CONCLUSION: While there is correlation between VCSS, CEAP, modified CIVIQ and venous ultrasound findings, sub-group analysis indicates that this correlation is driven by different components of VCSS compared to the other venous assessment tools. This observation may reflect that VCSS has more global application in determining overall severity of venous disease, while at the same time highlighting the strengths of the other venous assessment tools. With update of VCSS planned in the near future, validation of any revised VCSS should factor in the correlation of VCSS with other venous assessment tools.

7:50 AM – 8:10 AM **18. AVF Membership: Who Are We and Where Are We Going?**

J.M. Lohr
Lohr Surgical Specialists, LLC, Cincinnati, OH

BACKGROUND: The AVF Membership was surveyed regarding their current certification and professional activities.

METHODS: The certification survey was forwarded to all of the members of the American Venous Forum with a 28% response rate.

RESULTS: Of the respondents, currently one-third have a practice limited to venous disease and two-thirds had a mixed practice. 91% have hospital privileges that are active while 9% do not have hospital privileges. 52% of respondents have active privileges in an outpatient surgery center and 48% do not participate in an outpatient surgery center. 20% of respondents have a practice limited to office procedures and 80% have a mixed practice. 65% of the membership is Board Certified in Vascular Surgery. Several other boards are represented amongst the membership, for example: general surgery, cardio-thoracic and family practice.

Respondents identified issues with hospital emergency room call coverage, endovascular privileges or described their practice as established prior to vascular board certification. Emergency room call requirements appear to have regional variations with a variety of requirements for hospital privileges. Several respondents plan to limit their scope of practice to venous disease work only. Multiple respondents identified the circular logic of the need for hospital privileges to maintain certification. Multiple respondents identified the requirement for minimum number of procedures to maintain hospital privileges while their scope of practice is still limited. This was especially problematic for arterial procedures in a practice limited to venous disease. As venous stenting, mechanical thrombectomy and thrombolytic therapies evolve, the scope of venous practice will become more diversified. The need for hospital privileges is a current requirement of the Board of Surgery for maintenance of certification.

CONCLUSIONS: Multiple members of the AFV have identified these issues as an impediment to board certification. Several respondents however identified vascular certification as a bad idea. Modular maintenance of certification was also thought to be a poor solution by some of the membership. Several members suggested a separate standard be applied to those specializing solely in venous disease.

Clearly the American Board of Surgery will need to address the current requirements as maintenance of certification moves forward. The results of this survey have been shared with the American Board of Surgery.

8:10 AM – 8:30 AM **19. Penetrating Inferior Vena Cava Injuries are Associated with Thromboembolic Complications: A Review of the National Trauma Data Bank**

F.L. Joglar, P. Shaw, R. Eberhardt, N. Hamburg, J. Kalish, D. Rybin, G. Doros, A. Farber
Boston University Medical Center, Boston, MA

BACKGROUND: Prior studies suggest that inferior vena cava (IVC) injuries have high lethality and may increase the rate of thromboembolic complications in survivors. We sought to define the effect of penetrating IVC injury on thromboembolism risk in a large, comprehensive, nationwide registry of trauma patients.

METHODS: We conducted a case-control study derived from prospectively collected data from the National Trauma Data Bank (NTDB). Cases, identified by ICD-9 codes, were patients 18–65 years old who had penetrating abdominal trauma and IVC injury. Controls were patients with penetrating abdominal injury and no IVC injury. We excluded patients with previously diagnosed deep venous thrombosis (DVT), concomitant lower extremity vascular or skeletal injury, pelvic fracture, head trauma, or spinal cord injuries. Comparative analyses of demographics, injury severity scores, type of penetrating injury, complications, and outcomes were performed.

RESULTS: We identified 590 cases of patients with penetrating IVC injuries and 13,061 controls with penetrating abdominal injuries without IVC injury among 1,309,311 patients in the dataset. Two hundred and fifty six (43.4%) patients with IVC injury underwent some form of open repair or ligation. No endovascular repairs were reported. Demographic and outcome data are shown in the Table. Patients with IVC injury were more commonly African-American and more likely to be treated at a university hospital. IVC injury was associated more frequently with gunshot wounds. Patients with IVC injury had evidence of greater injury severity with lower presenting systolic blood pressure (SBP), higher injury severity scores (ISS), and longer ICU and overall length of stay (LOS). In IVC injury patients, the incidence of DVT was 2.88%. There was no difference in IVC filter use. Compared to control patients, patients with IVC injury suffered a higher risk of DVT OR 2.4 (95%CI 1.4, 3.9, p = 0.001). While there were no differences in limb complications including compartment syndrome, fasciotomy, or amputation, we did confirm higher mortality in patients with IVC injury.

CONCLUSIONS: Patients with IVC injury have a higher risk of DVT than those with penetrating intra-abdominal injury alone. Penetrating IVC injury is associated with increased injury severity and mortality. Our findings emphasize the importance of developing appropriate surveillance and prevention strategies to reduce the rate of venous thromboembolism in patients with IVC injury.

Variable (SD = standard deviation)	IVC Injury (n = 590)	No IVC Injury (n = 13,061)	p-value
Mean Age (SD)	29.8 (± 10.2)	30.9 (± 10.7)	0.018
Male (%)	538 (91.2)	11,813 (90.4)	0.566
African American (%)	287 (48.6)	5,097 (39.0)	<0.001
Hispanic (%)	117 (19.8)	3,090 (23.7)	
Caucasian (%)	105 (17.8)	3,248(24.9)	
Other (%)	40 (6.78)	865 (6.62)	
Hospital type (%)			0.013
University	396 (67.1)	8,117 (62.1)	
Community	156 (26.4)	3,751 (28.7)	
Nonteaching	21 (3.56)	777 (5.95)	
Mechanism (%)			<0.001
Firearm	487 (82.5)	7,688 (58.9)	
Stab injury	98 (16.6)	5,141 (39.4)	
ED Mean SBP (SD)	93.4 (±52.2)	120.6 (±39.7)	<0.001
Mean ISS (SD)	25.7 (±14.9)	15.2 (±12.0)	<0.001
Mean ICU LOS (SD)	6.06 (±10.9)	3.78 (±9.39)	<0.001
Mean overall LOS (SD)	12.0 (±19.9)	9.83 (±14.2)	<0.001
DVT (%)	17 (2.88)	162 (1.24)	<0.001
Pulmonary embolism (%)	5 (0.85)	60 (0.46)	0.180
IVC Filter (%)	4 (0.68)	66 (0.51)	0.565
Compartment syndrome (%)	5 (0.85)	80 (0.61)	0.478
Fasciotomy (%)	7 (1.19)	134 (1.03)	0.706
Amputation (%)	2 (0.34)	19 (0.15)	0.241
Pneumonia (%)	32 (5.42)	463 (3.54)	0.017
Mortality (%)	306 (51.9)	1,413 (10.8)	<0.001

8:30 AM – 8:50 AM **20. Endovascular Treatment for Chronic Cerebrospinal Venous Insufficiency in Multiple Sclerosis: A Longitudinal MRI Blinded Pilot Study**

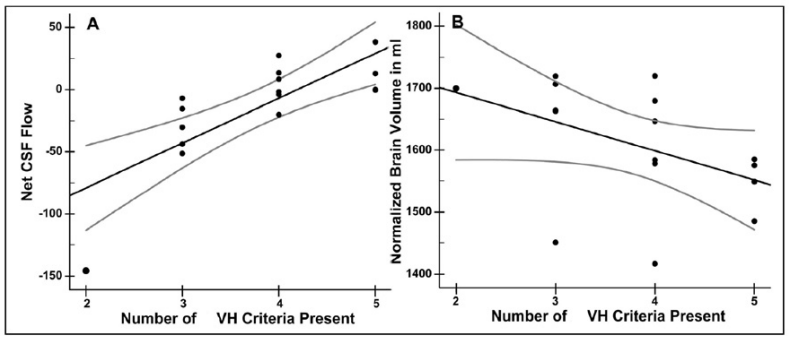
P. Zamboni[1], R. Galeotti[1], B. Weinstock-Guttman[2], G. Cutter[3], E. Menegatti[1], A.M. Malagoni[1], I. Bartolomei[4], J.L. Cox[2], F. Salvi[4], R. Zivadinov[2]
[1]University of Ferrara, Ferrara, Italy; [2]NY State University in Buffalo, Buffalo, NY; [3]University of Alabama, Birmingham, AL; [4]Bellaria Neurosciences, Bologna, Italy

BACKGROUND: Chronic cerebrospinal venous insufficiency (CCSVI) is characterized by stenosies of the internal jugular veins and/or the azygous vein. It has been recently reported that this condition contributes to severe disregulation of the physiologic mechanisms of cerebral venous outflow in patients with MS. Endovascular treatment (EVT) demonstrated to be a safe and effective CCSVI treatment, but only in a not blinded clinical evaluation.

METHODS: We designed an open-label, MRI-blinded, two-center, randomized, EVT intervention parallel-group, 12 month study (EVTMS) following an initial cross-sectional (CVIMS) study. Sixteen relapsing-remitting MS patients, 8 from Ferrara, Italy and 8 from Buffalo, NY were enrolled in CVIMS. All 16 patients who completed the CVIMS study and presented severe Doppler hemodynamic venous anomalies (VH) accepted participation in the EVT intervention prospective study (EVTMS). Half of the cohort (early intervention group, 4 from Buffalo and 4 from Italy) were randomly selected to have the EVT procedure (in Italy) at 3 months, whereas 6 patients (delayed control intervention group, late group) at 6 months; 2 patients were followed up without any EVT. The EVT procedure consists of selective venography complemented by balloon dilatation when significant stenosies are detected. All patients will be prospectively evaluated at 3, 6, 9 and 12 months with sonography, MRI, and clinical examinations.

RESULTS: CVIMS cross-sectional study. Mean age at baseline was 36.1 ± 7.3 yrs, mean disease duration 7.5 ± 1.9 yrs and median EDSS 2.5. Mean number of gadolinium active lesions at baseline was 0.38 ± 1.5 and mean number of T2 lesions 27.1 ± 10.5. Median of VH of CCSVI was 4 (2–5).

All 16 MS patients investigated and none of the HCs met the VH criteria for CCSVI ($p < 0.0001$). MS patients showed significantly lower net CSF flow compared to the HC ($p = 0.038$) that was associated with number of anomalous VH criteria present ($r = 0.79$, $p < 0.001$) (Figure A), confirmed by the strong relationship with the venous haemodynamic insufficiency severity score ($r = 0.77$, $p < 0.0007$). Moreover, increases in the number of anomalous VH criteria present were negatively associated with lower whole brain volume (Spearman $R = -0.5$, $p = 0.05$) (Figure B). **EVTMS longitudinal study.** The longitudinal 1 year blinded study will be concluded next October and results analysis completed within the Fall.



CONCLUSIONS: CCSVI is associated with abnormal CSF flow dynamics and decreased brain volume. Finally, the EVTMS study should provide valuable data on preliminary efficacy of EVT for CCSVI associated to MS.

8:50 AM – 9:00 AM **EUROPEAN VENOUS FORUM**

(First Place Winner)

Intraluminal Fibre-Tip Centering Can Improve Endovenous Laser Ablation: A Histological Study

M. Vuylsteke[1], J. Van Dorpe[2], J. Roelens[3], Th. De Bo[1], S. Mordon[4]

[1]Department of Vascular Surgery Sint-Andriesziekenhuis Tielt Belgium; [2]Department of Pathology Heilig-Hartziekenhuis Roeselare Belgium; [3]Department of Pathology Sint-Andriesziekenhuis Tielt Belgium; [4]INSERM U 703, Lille University Hospital, 59037 Lille, France (SM)

OBJECTIVE: In this histological study we analysed the use of a new tulip-shaped self-expandable catheter fixed to the fibre for ELT in an anial model (goats). Can the avoidance of the direct contact between the fibre tip and the vein wall prevent vessel wall ulcerations and perforations and perivenous tissue destruction? We were looking the difference in destruction between veins treated with a normal bare fibre and veins treated with this new catheter fixed to the fibre.

MATHERIALS AND METHODS: In 10 goats, 20 lateral saphenous veins were treated with ELT. In 10 veins we used the tulip-shaped catheter fixed to the fibre (Figure 1). With a 980 nm diode laser (Inter-Medic°, Barcelona, Spain) 62,1J/cm on average were administrated.

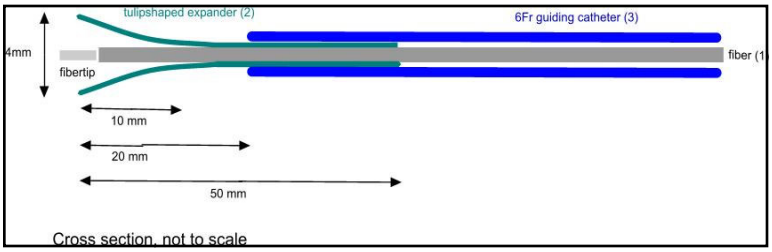


Figure 1: Tulip-shaped self-expandable catheter fixed to the fibre.

Postoperatively the veins were removed at different stages and sent for histological examination. The pathologists measured the diameter of the ulcerations, as well as the depth of penetration in the vein wall. A score to measure the perivenous tissue destruction was used (see the following).

Description of the fibre-tip catheter: "Tulip-catheter"

To prevent the direct contact of the fibre tip with the vein wall, a fibre-tip centering catheter was designed. It consists of a tube fixed to the fibre, with a tulip-shaped self expandable end at the fibre tip (Tobrix, Waarle, The Netherlands). This tube is folded in a outer guiding catheter. The fibre tip is covered by the tulip. The material is thermoresistant (up to 200°C). When withdrawing the outer guiding catheter (pullback), the tulip shaped end of the catheter expands and pushes away the vein wall. With this manoeuvre the intraluminal centering of the fibre tip is obtained and avoiding a direct contact with the vein wall. (Figure 1).

Perivenous tissue destruction scale (Figure 2):

The lateral saphneous vein in a goat is surrounded by a triangular shaped fascia. At three different points at the edge of the vein, located at a distance of 120° from each other, the perivenous tissue destruction is measured. The distance between the vein wall and the surrounding fascia is divided in three equal layers. Extent of necrosis was graded following the scale: 0 = no necrosis, 1 = necrosis. Consequently, at each location, if the 3 layers were involved extent of necrosis was graded 3, if the necrosis was seen in all 3 positions, the maximum necrosis score could reach 9. We count one point for each part where necrosis is seen.

The perivenous tissue destruction was measured at different stages after ELT (immediately, 10 days and 3 weeks).

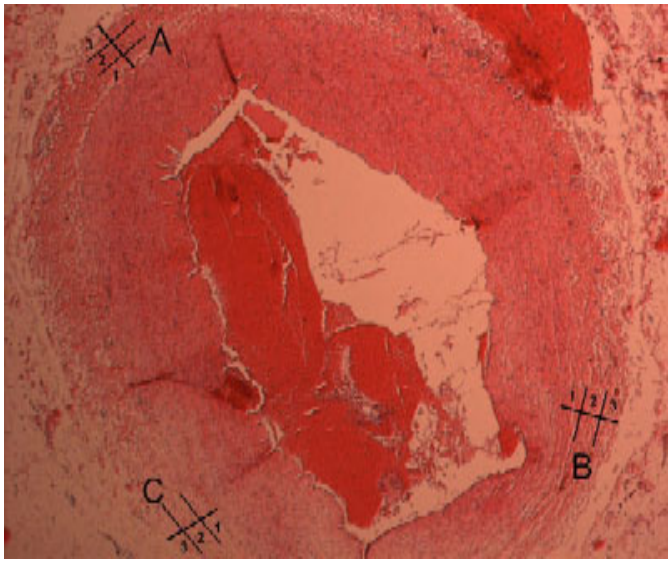


Figure 2: Perivenous tissue destruction scale: at three points (A,B,C) the perivenous destruction is measured. The distance between the edge of the outer vein wall and the surrounding fascia is divided in three parts (1,2,3).

Measurements of perivenous temperature:

Peroperatively the temperature in the perivenous liquid collection was measured using thermocouples (Thermocouple type K). One needle was inserted at the proximal and another at the more distal part of the vein. The needle location in the perivenous liquid in the immediate proximity to the vein wall was controlled by peroperative ultrasound. The probes for temperature readings were connected to a digital thermometer (Pronto tc, Thermo-Electric, Balen, Belgium). Temperature was measured during fibre withdrawal in order to determine the maximum temperature for both groups (with and without tulip-catheter).

RESULTS: A temperature increase around the treated vein (in the tumescent liquid) was observed during fibre pullback. On average the maximum temperature was 50°C (min: 32,3°C; max: 68,3°C) without using the catheter and 47°C (min: 34,1°C; max: 80°C) using the tulip-catheter. These differences were not statistical significant ($p > 0,05$).

Veins removed immediately after ELT (without catheter) ($n = 6$, 78 sections) show an uneven destruction of the vein wall with ulcerations and perforations. Using the catheter these ulcerations were avoided. In veins removed 10 days after treatment ($n = 8$, 99 sections), we found a much more extended vein wall destruction. Using the tulip-shaped catheter we obtained a significant higher circumferential total vein wall necrosis (79,8 versus 64,4%) ($p = 0,001$) and a reduced perivenous tissue destruction rate ($p < 0,001$). Veins removed three weeks ($n = 6$, 88 sections) after treatment still show a higher circumferential vein wall necrosis (97,6 versus 79,1%) ($p < 0,001$) but the difference in perivenous tissue destruction disappeared due to inflammatory regression and healing of the damaged tissue ($p = 0,47$).

CONCLUSION: The use of a new tulip-shaped self-expandable catheter fixed to the fibre for ELT avoids the usual ulcerations and perforations of the vein wall, results in a more even vein wall destruction with necrosis of a higher percentage of the circumferential vein wall. The perivenous tissue destruction and reactive inflammatory reaction is significantly lower. This can clinically correlate with less postoperative pain and periphlebitis. The direct contact between the fibre tip and the vein wall should be avoided if possible.

9:00 AM – 9:10 AM **EUROPEAN VENOUS FORUM**
(Second Place Winner)

Atresia of the Inferior Vena Cava and Iliofemoral Venous Thrombosis—Experiences with Catheter-Directed Thrombolysis

Rikke Broholm, Niels Bækgaard, Sven Just, Maja Jørgensen og Leif Panduro Jensen
Department of Vascular Surgery, Department of Radiology and the Thrombosis Centre, Gentofte University Hospital, Denmark

BACKGROUND: Deep venous thrombosis (DVT) in the iliofemoral segment triggered by atresia of the inferior vena cava is a known phenomenon. The conventional treatment of these patients is anticoagulation therapy. Treatment with catheter-directed thrombolysis has been described in a few cases with different treatment results and is not a standard offer. We describe the yet known largest material of patients with atresia of the inferior vena cava and iliofemoral thrombosis treated with catheter-directed thrombolysis (CDT).

MATERIAL AND METHODS: Inclusion criteria were iliofemoral thrombosis with duration of symptoms of maximum 14 days, first episode of DVT, age below 60 years, and distal popliteal vein without thrombus. A multiple side-hole catheter with tip occlusion was placed in the thrombus via the popliteal vein, and pulse spray infusion with rt-PA and heparin was given. Daily venography was performed to evaluate the treatment, which was terminated when all thrombus was resolved. Patients were started on anticoagulation treatment on a life-long basis combined with long graded compression stockings for one year. Follow-up with clinical examination and ultrasonography was performed after 3, 6, and 12 months and annually thereafter.

RESULTS: In the period 2001–2008, 10 patients with atresia of the inferior vena cava and iliofemoral thrombosis were included for CDT. Four women and 6 men with a mean age of 30 years (range 15–46 years) were treated for iliofemoral DVT involving 12 legs. Median follow-up was 30 months (range 2–85 months). All patients had patent iliofemoral vein segments including opened abdominal collateral veins at follow-up. One patient developed reflux in the popliteal vein after four years.

CONCLUSION: Young people with massive thrombosis of the pelvic and femoral veins or bilateral deep venous thrombosis must be considered of having atresia of the inferior vena cava. CDT can be performed in these patients with very promising results and few complications, and must be considered in all patients with this diagnosis.

9:10 AM – 9:20 AM **ACP PLATINUM ABSTRACT**

Comparison of Transcranial Doppler Hits Detection During CO2-O2 Versus Air-Based Foam Sclerotherapy of Superficial Veins of the Lower Extremity

Diana L. Neuhardt, RVT

PURPOSE: Detection of high intensity transient signals (HITS) by transcranial doppler (TCD) in the middle cerebral artery during ultrasound (US) guided foam sclerotherapy (USGFS) has been described. We compared incidence of HITS, associated or not with symptoms, during treatment with CO2-O2 versus air-based foams.

METHODS: USGFS was performed in superficial veins of the lower extremity to complement thermal ablation of the great saphenous vein; 65 patients (86% women) were treated with CO2-O2 -based foam and 71 (77.5% women) with air-based foam. Middle cerebral artery TCD HITS recordings at the 90% confidence level were performed with a head set during foam injection. Total volumes of CO2-O2 and air-based foams injected were 18 ± 8 (4–42) and 17 ± 8 (3–44) ml respectively.

RESULTS: The following findings were similar during CO2-O2 and air-based foam injection, a) incidence of HITS, 34% (n = 22) vs 38% (n = 27) (P = .6); b) volumes injected at occurrence of 1st HITS, 8 ± 4 (1–18) vs 9 ± 6 (2–24) ml (P = .2); c) incidence of HITS and symptoms, 12% (n = 8) vs 14% (n = 10) (P = .8); d) incidence of HITS without symptoms, 22% (n = 14) vc 24% (n = 17) (P = .7); e) reporting of symptoms without HITS, 8% (n = 5) vs 7% (n = 5) (P = .9). Dizziness and light headedness were more common with CO2-O2 (8 vs 2, P = .03) while migraine, headache and/or cough were more common with air (12 vs 4, P = .05). For both groups, a) incidence of HITS, 36% (n = 49) was higher than reporting of symptoms (21%, n = 28) (P = .005); b) no HITS predicted no symptoms (89%, 77/87); and c) HITS did not predict symptoms (36%, 18/49).

CONCLUSIONS: A high incidence of middle cerebral emboli was noted for both CO2-O2 and air-based foams. Differences in reported symptoms but not in HITS were noted. HITS, an objective finding, was more common than subjective reporting of symptoms. Additional research may determine if TDC HITS represent patent foramen ovale or right to left cardiac shunts.

9:20 AM – 9:45 AM **Coffee Break — Visit Exhibits**

9:45 AM – 11:45 AM	**SCIENTIFIC SESSION V** **Award Session** *Moderator: Joseph A. Caprini, MD* *Peter J. Pappas, MD* *(No CME credit will be provided for this session.)*
9:45 AM – 9:55 AM	**BSN Jobst** *2009 Winnter – Interim Report* Carolyn Glass, MD, University of Rochester
9:55 AM – 10:10 AM	**Servier** *2009 Winners – Report* Atul Rao, MD Axel Thors, MD
10:10 AM – 10:15 AM	**Sigvaris** *2010 Winners Announcement*
10:15 AM – 10:30 AM	**Presidential Address Introduction** *Introduction By: Peter J. Pappas, MD* *President-Elect*
10:30 AM – 11:30 AM	**PRESIDENTIAL ADDRESS** **Hemostasis and Thrombosis: Personal Reflections 40 Years On** Joseph A. Caprini, MD
11:30 AM – 12:30 PM	**MEMBER BUSINESS LUNCHEON**
12:30 PM	**Free Afternoon** *Golf/Tennis Tournaments*

NOTES

SATURDAY, FEBRUARY 13, 2010

7:00 AM – 8:00 AM **Continental Breakfast — Visit Exhibits**

8:00 AM – 9:25 AM **SCIENTIFIC SESSION VI**
IVC and Filters
Moderators: *David L. Gillespie, MD*
Antonios P. Gasparis, MD

Educational Objectives: At the conclusion of this session, participants should be able to:

1. Know the indications for stenting chronically obstructed IVC filters.
2. Be aware of cost-effectiveness in using prophylactic filters.
3. Know the options for large vein reconstruction in oncologic surgery.

8:00 AM – 8:20 AM **21. Stenting of Chronically Obstructed IVC-Filters**
P. Neglén, M.D. Oglesbee, S. Raju
River Oaks Hospital, Flowood, MS

BACKGROUND: Patients with postthrombotic ilio-caval obstruction may previously been protected from developing pulmonary embolism by insertion of an IVC filter. The aim is to study the stent-related outcome in patients stented across an obstructed IVC filter.

METHODS: From 1999–2009, 554 limbs had stenting for postthrombotic ilio-caval outflow obstruction, including recanalization of occlusion in 86 limbs. An IVC filter had previously been inserted in 53 patients (10%). In 25 patients the IVC filter was obstructed (Group X). The site was traversed by a guidewire and simply balloon dilated up to 16 atm pressure. The filter was either displaced sideways or remodeled depending on the type of filter, including those with prongs. An appropriately sized stent was then placed across the IVC-filter and re-dilated. In 28 other patients the cephalad termination of stenting terminated below a patent IVC filter (Group B). The patients were followed regularly with ascending or transfemoral venography and duplex ultrasound scanning to assess patency. The types of re-intervention were noted.

RESULTS: The stenting maneuver through the previously inserted IVC filter (Greenfield 11, Recovery G2 6, Meditech 3, VenaTech 2, Bird's nest 1, TrapEase 1, Gunther Tulip 1) was safely performed without tear of the IVC and no subsequent bleeding. The mortality was nil, morbidity minimal. Postoperative DVT <30 days occurred in 3/25 (12%). The stented postthrombotic obstruction was occlusive requiring guidewire recanalization prior to stenting in 17/25 limbs (68%) and 7/28 limbs (25%) in Group X and Group B, respectively. The cumulative secondary

patency in Group X (6 stents occluded, 3 re-opened; and 9 re-interventions performed in non-occluded stents) and Group B (4 stents occluded, 2 re-opened; 8 re-interventions performed on non-occluded stents) were at 4 years 73% and 83%, respectively; log rank test p = 0.125. The cumulative secondary patency rate of postthrombotic limbs without filter (n = 501) was at 4 years higher (89%) than those with IVC filter (76%) (p = 0.034). However, there is no difference when a comparison is made between limbs stented for recanalized occlusion with (n = 24) and without IVC filters (n = 86) (68% and 69%, respectively, p = 0.764).

CONCLUSIONS: Stenting across an obstructed IVC filter is safe and has minimal morbidity whether or not the obstruction is occlusive or non-occlusive. The patency rates are not influenced by the fact that an IVC filter is crossed by a stent but related to the severity of postthrombotic disease (occlusive or non-occlusive obstruction) and the associate recannalization procedure.

8:20 AM – 8:40 AM **22. Prospective Randomized Study Comparing the Clinical Outcomes Between IVC Greenfield Filter and TrapEase Filters**

A. Hingorani, E. Ascher, N. Marks, F. Usoh, A. Shiferson, K. Gopal, D. Jung, S. Reddy, T. Jacob
Maimonides Medical Center, Brooklyn, NY

Although anticoagulation remains the mainstay of treatment for DVT, the utilization of vena cava interruption devices in patients who have failed or in whom anticoagulation is contraindicated remains a safe and effective treatment. In this regards, Greenfield and Trapease filters are arguably the most popular filtration devices among the ones that are currently in use. Greenfield filter®, which is available in 12–14 Fr introducer, has been around for more than 30 years and has been well studied. On the other hand, TrapEase filter®, which is only 6 Fr, has been around for lesser number of years with limited number of studies. Despite the popularity of the above mentioned filtration devices, there are no good guidelines in place to help determine which filter to use in any given situation. Therefore, in this study we prospectively compared the clinical outcomes between the above-mentioned filters in a randomized fashion.

METHOD: Between July 2006 and November 2008, 156 patients (63 males, 93 females; mean age of 75 years (range, 38–101 years = \-13 (sd)) were randomized to either Greenfield (n = 84) or TrapEase (n = 72) IVC filters. During this same period, 349 patients (143 males, 206 females, mean age 75 years = \-15 (sd), range 24–96 years) were not randomized. Other demographics were: randomize group (malignancy = 26.9%, PE = 17.3%) non-randomized group (malignancy = 16.9%, PE = 17.2%). The inclusion criteria were high risk procedure for thromboembolism, contraindication to anticoagulation, failed anticoagulation, pulmonary embolism. All 156 filters were inserted in the infrarenal position by one group of surgeons at one institution using angiographic guidance. Follow -up consisted of serial lower extremity and iliac/IVC duplex (78.2%) at post-op day 1, 1st week, every 3 month for the first year, and every 6months for the second year, clinical evaluation, and clinic visits.

RESULT: Indications for filter placement in the randomized group were (GI bleeding = 37, intracranial hemorrhage = 12, free floating clot = 19, failure of anticoagulation = 29, PE = 27, prophylactic = 4, others = 32) and non-randomized (GI bleeding = 78, intracranial hemorrhage = 26, free floating clot = 31, failure of anticoagulation = 51, PE = 60, prophylactic 31, others = 77). During a mean follow-up of 10 = \-9 months (sd) (range 0–33 months), 5 patients (6.94%) developed symptomatic IVC/iliac thrombosis in the TrapEase group and none in the Greenfield group (P-value = 0.019). Overall mortality was 32.7% (51 patients) and 30 day mortality was 13.5% (21 patients: 10 in TF and 11 in GF group respectively). The study was initially designed to recruit 360 patients but was prematurely concluded due the results.

CONCLUSION: There is a higher rate of symptomatic IVC filter thrombosis associated with Trapease filter placement.

8:40 AM – 9:00 AM **23. Cost-Effectiveness of Guidelines for Insertion of Inferior Vena Cava Filters in High-Risk Trauma Patients**

E.L. Spangler, E.D. Dillavou, K.J. Smith
University of Pittsburgh, Pittsburgh, PA

BACKGROUND: Inferior vena cava filters (IVCF) can prevent pulmonary embolism (PE), however, indications for use vary. While the Eastern Association for the Surgery of Trauma (EAST) 2002 guidelines suggest prophylactic IVCF use in high-risk patients, the American College of Chest Physicians (ACCP) 2008 guidelines do not. This analysis compares cost-effectiveness of prophylactic versus therapeutic retrievable IVCF placement in high-risk trauma patients.

METHODS: A Markov model was created to determine incremental cost-effectiveness of these guidelines in dollars per quality-adjusted life years (QALYs) by accounting for costs and utilities of events occurring during hospitalization and long-term follow-up. Our population was 46 year-old trauma patients at high risk for venous thromboembolism (VTE) by EAST criteria to whom either the EAST (prophylactic IVCF) or ACCP (no prophylactic IVCF) guidelines were applied. The analysis assumed the societal perspective over the patient's lifetime, using a one day cycle length. For base case and sensitivity analyses, event probabilities and utilities were obtained from published literature, and costs calculated from CMS fee schedules, the HCUP database, and Redbook wholesale drug prices for 2007; for data not available from the literature, assumptions were set forth based on similarities to other populations.

RESULTS: In base case analysis, prophylactic IVCF were not cost-effective, being both more costly ($37700 vs. $37300) and less effective (by 0.139 QALYs) than therapeutic IVCF. Results were sensitive to several probabilities; the cost-effectiveness of prophylactic IVCF varied significantly with probabilities of late VTE and complications related to anticoagulation. Prophylactic filters were less effective, but less costly when the probability of late VTE was less than 4.3% per year (base case 4.6%) among those with a removed filter, or less than 5.1% per year (base case 6.1%) among those with a retained filter. The probability of anticoagulation complications, primarily gastrointestinal bleeding, was assumed to be the same in individuals with removed filters and individuals who never had a filter. Prophylactic filters were less effective, but less costly when the probability of anticoagulation complications among those with a removed filter or who never had a filter was greater than 3.9% per year (base case 2.5%). Prophylactic filters were less effective and more costly over the range of probabilities in the literature of anticoagulation complications for individuals with a retained filter (base case 2.1% per year).

CONCLUSIONS: Our analysis suggests prophylactic IVC filters are not cost-effective. This result is dependent on probabilities of long-term sequelae (VTE, bleeding complications) which are poorly characterized in the literature due to the recent advent of retrievable filters and lack of long-term follow-up in patients with retained and removed filters.

9:00 AM – 9:20 AM **24. Large Vein Reconstruction with Oncologic Procedures**

M.A. Mansour, B. Wheatley, J.M. Gorsuch, C.A. Chambers, R.F. Cuff
Michigan State University, Grand Rapids, MI

BACKGROUND: Tumor proximity or invasion of large venous structures in the abdomen frequently requires resection or reconstruction of large veins.

OBJECTIVE: To review the outcomes of large vein reconstruction in conjunction with surgical resection of intraabdominal tumors.

PATIENTS & METHODS: In a 5-year period, 16 patients (2 women and 14 men) presented for resection of intraabdominal malignancy. The average patient age is 57 (range 41 to 67). Tumor proximity or invasion of large venous structures was detected on preoperative CT scan. The groins were prepared in the surgical field to facilitate harvesting of the great saphenous vein if necessary. Venous reconstruction with primary resection and reanastomosis or saphenous panel graft was performed in all cases except one, where the entire infrarenal inferior vena cava (IVC) was replaced with a PTFE graft. Follow-up imaging was done in all patients within 3 months.

RESULTS: Resection of tumors invading or adjacent to IVC was done in 8 patients, portal vein in 7 and iliac vein in one patient. For the IVC patients, tissue pathology was renal cell carcinoma in 5, leiomyoma in 2 and recurrent testicular cancer in one. All the portal vein cases were due to pancreatic adenocarcinoma. Extracorporeal femoral to axillary venovenous bypass was performed in 3 pts to help venous return during clamping. One patient had hypothermic circulatory arrest to resect an intravascular tumor that extended from the right ilac vein to the atrium. Reconstruction of the portal vein was with primary repair in 4 and paneled saphenous vein in 3. The IVC was primarily repaired in all but one case. The iliac vein was repaired with paneled saphenous vein graft. All patients survived their operation and were alive in the average follow-up period of 9 months (range 1 to 60 months). The patient with the prosthetic graft presented with a duodenal leak and graft infection necessitating graft excision at 4 weeks. Recurrent pancreatic cancer was detected in 3 patients. All venous structures were patent in follow-up, except for one.

CONCLUSION: Large vein reconstruction is required in a small number of patients to restore venous continuity. Primary repair or bypass with autogenous graft is preferable to ligation or prosthetic graft. The large majority of venous reconstructions remain patent without any special anticoagulation.

9:20 AM – 9:25 AM **Poster Winner #1**

9:25 AM – 10:00 AM **Coffee Break**

10:05 AM – 12:30 PM **SCIENTIFIC SESSION VII**

Chronic Venous Insufficiency

Moderators: *William A. Marston, MD*
Nicos Labropoulos, MD

Educational Objectives: After completion of this session, the participant will be able to:

1. Identify and treat atypical causes of limb swelling.
2. Understand the effect of stretch on TGF-β expression by dermal fibroblasts.
3. Determine changes in the vein wall induced by venous thrombosis.
4. Understand the key components of measurement of quality of life in venous disease.

10:05 AM – 10:25 AM 25. Post-Menopausal Leg Swelling

S. Raju[1], M. Oglesbee[2], P. Neglen[2]
[1]*University of Mississippi Medical Center, Jackson, MS;* [2]*River Oaks Hospital, Flowood, MS*

BACKGROUND: Leg swelling after menopause is common. Prevailing concept in primary care is that it is polycentric and a treatable cause may not be found. Traditional systemic causes may be investigated but venous etiology is rarely considered. Patients are placed on empiric diuretics often without benefit. Our clinical experience outlined herein indicates that iliac venous vein obstruction is frequently the core cause; a variety of secondary factors that are common in the post-menopausal life stage (e.g., joint surgery, onset of venous reflux, venosclerosis, seated orthostasis etc) disturb the precarious regional fluid balance and precipitate swelling. Postulated but undefined hormonal and metabolic imbalances may be contributory.

METHODS: 310 limbs in 256 postmenopausal women (≥55 years age) with leg swelling unresponsive to conservative therapy underwent IVUS guided iliac vein stenting (49 with concurrent EVLT) over a 11 year period. The group constituted 18% of all CVD limbs (n = 1760) stented during the same period and 34% of those stented for swelling. Median age was 66 (range 55–92) and left to right ratio (3:1).

RESULTS: Obstruction was primary in 65% and postthrombotic in 35% of limbs. 31% of limbs had obstruction only and 69% combined obstruction/ reflux: 32% had superficial reflux, 10% deep reflux and 24% had both. Axial reflux was present in 8%. Lymphatic dysfunction was present in 13% of the limbs. Mean IVUS area stenosis was 70 % (±20% SD). Thirty day mortality was nil. DVT occurred in 7 limbs <30 days and in 5 others later (overall 4%). Mean follow up was 19 months (±22 SD) (range 1–120 months). Secondary stent patency (6 years) was 100% in primary and 78% in postthrombotic limbs; overall 91%. 14 stents occluded of which 5 were reopened. Swelling improved significantly (P < .0001)

from preoperative grade 2 (±1 SD) to postoperative grade 1 (1.2 SD). Associated pain also improved significantly ($P < .0001$) from preoperative VAS 4 (±3) to postoperative 0.6 (1.7 SD). QOL (CIVQ) scores improved significantly ($P < .0001$) in every category (pain, work, sleep, social, morale) and overall (preoperative 66 ± 20 to postoperative 49 ± 22; $P < .0001$).

CONCLUSIONS: Patients with post-menopausal leg swelling frequently have obstructive venous pathology and two thirds have associated reflux. Morbidity arises from painful swelling that retards mobility and compromises ability of self care at a frail stage of life. Characteristic clinical features and pathology should qualify this large subset as a distinct clinical entity. Outpatient percutaneous iliac vein stenting alone or with concurrent saphenous ablation afford substantial symptom relief and improvement in QOL measures. Greater clinical awareness among primary care physicians is essential to serve this otherwise neglected patient population.

10:25 AM – 10:45 AM 26. Neonatal and Adult Dermal Fibroblasts Show Differences in TGF-ß Secretion and TGF-ß Type II Receptor Expression at Baseline and Under Constant Stretch Conditions

C. Glass, J. Cullen, E. Roztocil, C. Doan, G. Augustin, K. Illig, M. Singh, D. Gillespie
University of Rochester, Rochester, NY

BACKGROUND: Previous investigations in dysregulation of tissue fibrosis seen in chronic venous insufficiency (CVI) have used commercially available neonatal fibroblasts (nn-fbs) as controls. Adult fibroblasts (a-fbs) are commercially available but have not been utilized as controls to study venous disease, which occurs predominantly in the adult population. In an effort to investigate if TGF-β alterations occur as a normal process in healthy aging fibroblasts, we examined TGF-β, TGF-βRI, and TGF-βRII expression between commercial nn-fbs and a-fbs. Furthermore, we attempted to determine if there were any differences in response to mechanical stress between healthy nn-fbs and a-fbs.

METHODS: Confluent early passage (P3-P5) nn-fbs and a-fbs were cultured and flow cytometry (fluorescence activated cell sorting—FACS) was performed to determine basal levels of TGF-β RI and TGF-β RII positive cells, and receptor density (mean fluorescent intensity—MFI). Basal levels of secreted TGF-β were quantified using enzyme linked immunosorbent assay (ELISA). Also, in order to mimic the increased stretch to which dermal fibroblasts are exposed to in patients with CVI, nn-fbs and a-fbs were cultured on collagen coated flexplates, and subjected to constant equibiaxial elongation (21%) for 24 hours using a Flexercell® strain unit. Cells and media were harvested and TGF-β secretion in response to stress was determined by ELISA.

RESULTS: While there was no difference in the number of TGF-βRI and TGFβ RII positive cells between a-fbs and nn-fbs, there was a 40% reduction in TGF-β RII density as determined by MFI in a-fbs, when compared to nn-fbs (151 ± 25 vs 51 ± 27, n = 6, p = 0.03). In healthy commercial nn-fbs subjected to constant mechanical stress for 24 h, there was no change in TGF-β secretion compared to the static (control) nn-fbs. However, there was a 4-fold increase in TGF-β secretion (284 ± 133 vs 1076 ± 238 pg/ml, n = 4, p = 0.03) in a-fbs exposed to mechanical stress when compared to their control.

CONCLUSION: Previous studies investigating venous ulcer fibroblasts have shown alterations of TGF-β and their receptors. This study reveals that these alterations may occur as part of the normal aging process as demonstrated by baseline differences seen between nn-fbs and aa-fbs. Furthermore, a-fbs should be considered for use as controls, as these fibroblast possess normal age specific characteristics that may more closely reflect venous disease in the adult population.

10:45 AM – 11:05 AM 27. Post Thrombotic Vein Wall Remodeling: Preliminary Findings

K. Deatrick, N. Baker, S. DeRoo, M.A. Elfline, V. Sood, C. Stabler, S.A. Blackburn, C.E. Luke, T.W. Wakefield, P.K. Henke
University of Michigan, Ann Arbor, MI

BACKGROUND: Post-thrombotic syndrome (PTS) is characterized by a fibrotic vein injury following deep vein thrombosis (DVT), resulting in a less compliant vein wall. We sought to quantify the change in vein wall thickness, and to determine if vein wall damage, defined as wall thickening, is worsened in patients who fail to resolve DVT by 6 months, and whether there were differences in blood or plasma levels of proteins associated with tissue remodeling.

METHODS: Patients presenting with suspected lower extremity DVT were evaluated. Ultrasound imaging of the lower extremity venous system was performed, and blood was collected. Patients with DVT received repeat evaluation with blood draw and ultrasound imaging at 6 months. DVT resolution was assessed using ultrasound examination. The thickness of the vein wall was quantified by ultrasound imaging in each segment affected by thrombus, and a contralateral, unaffected vein wall served as a control. mRNA was extracted from whole blood using the PAXgene system, and serum proteins were analyzed using ELISA. ANOVA or Student's t-tests were used, and a $P < 0.05$ was significant.

RESULTS: 30 patients (10 patients with DVT resolution at 6 months, 10 patients with persistent thrombus, and 10 healthy controls) were compared. Both resolving and non-resolving DVT were associated with 1.5–1.8 fold increased vein wall thickness at 6 months (n = 10–12; P = .008) as compared with non affected vein wall segments. However, the thickness of the affected segments was 1.4 fold greater in patients who had total resolution of the DVT by 6 months than in patients who had persistent chronic thrombus 6 months after presentation (N = 10–12; P = 0.01,). There was a 4–5 fold increased level of MMP-9 in all thrombosed groups compared with controls (n = ;P < 0.05), while Toll like receptor-9 (TLR-9) expression was 3 fold less than controls (n = ;P < .05). There were no statistically significant differences in the levels of associated factors such as D-dimer, P-selectin, or inflammatory and remodeling markers such as SLC or MMP-2 by ELISA. There were no significant differences in the gene expression of CRP, MMP-2, MMP-9 or TLR-4.

CONCLUSIONS: This preliminary study suggests ongoing vein wall remodeling after DVT. At 6 months, the vein wall is markedly thickened, but this change is independent of thrombus resolution, and associated with elevated MMP-9 but not other inflammatory markers. This suggests that the vein wall damage is initiated early following thrombus formation, and persists even in the presence of total resolution.

11:05 AM – 11:25 AM 28. Development of a Questionnaire to Evaluate the Burden of Chronic Venous Disease in Daily Life

J. Guex, Sr.[1], N. Rahhali, Jr.[2], C. Taieb, Jr.[2]
[1]SFP, Nice, France; [2]PFSA, Boulogne, France

BACKGROUND: In a difficult economic context, the burden of chronic diseases is becoming a greater concern for public health authorities. Healthcare professional and institutions need an evaluation tool to assess objectively the burden of Chronic Venous Disorders and its consequences. This study is a very preliminary approach.

METHODS: The questionnaire was developed according to a strict methodological process in order to guarantee its credibility and reliability. A review of the literature and face-to-face interviews were carried out enabling the identification of 66 items linked to the pathology. Reduction to 36 items after evaluation, and suppression of redundant, non-specific and non-sensitive items.

RESULTS: Exploratory evaluations have shown that the concept of burden could be structured around 6 aspects : Pain,daily life, family and personal relationships, work, psychological impact and treatment by GP. For a complete evaluation of the burden, evaluation of these 6 aspects was complemented with 3 VAS (Visual Analog Scales): « psychological » VAS, « Physical » VAS and « Living with the disease » VAS The "Assessment of Burden in Chronic – Venous disorders" (ABC-V) questionnaire was administered to a population of subjects consulting spontaneously for CVD with a phlebologist: CVD was confirmed by the specialist. In fact 8 centres throughout France recruited 328 subjects: 82.7% of women, average age: 54.6 years (sd 13), 59% with a professional activity, 32% were overweight or obese according to BMI.

BVD	Average ± Standard deviation	Proportion of the total score
« Pain » aspect	4.46 ± 3.04	19.91%
« Physical » VAS	3.75 ± 2.68	16.74%
« Living with the disease » VAS	3.69 ± 2.83	16.47%
« Psychologcal » VAS	2.96 ± 2.64	13.21%
« Daily life » aspect	2.17 ± 2.65	9.69%
« Psychological » aspect	2.15 ± 2.60	9.60%
« Work » aspect	1.65 ± 2.23	7.37%
« Doctor » aspect	1.07 ± 1.85	4.78%
« Family life » aspect	0.49 ± 1.67	2.19%

The correlations between the ABC-V score and the SQOR-V and CES-D scores (recognized and validated questionnaires) were sought. The ABC-V score is highly positively correlated to SQOR-V and CES-D score. The 3 aspects with the greatest impact on the burden are: pain, « Physical » VAS and « Living with the disease » VAS. The 2 aspects with the lowest impact on the burden are: Treatment by GP and Family life.

CONCLUSIONS: Chronic pathologies such as venous disease remain frequent and crippling diseases, difficult to assess with only clinical elements or quality of life since the impact can be multidimensional. Several existing questionnaires attempt to evaluate one or another of these aspects, the ABC-V takes them all into consideration to express the global nature of the handicap/burden of chronic diseases.

11:25 AM – 11: 30 AM	**Poster Winner #2**
11:30 AM – 12:30 PM	**D. EUGENE STRANDNESS MEMORIAL LECTURE** **RIETE Database and Multiple Clinical Perspectives** Manuel Monreal Bosch, Barcelona, Spain *Introduced By: Joseph A. Caprini, MD*
12:30 PM – 1:45 PM	**LUNCH SYMPOSIUM** **Venous Research & Education—Where Do We Go From Here? (A Look at the Impact of AdvaMed and PhRMA Codes)** Steve Elias, MD

1:55 PM – 3:00 PM **SCIENTIFIC SESSION VIII**
Lymphedema and Compression
Moderators: *Fedor Lurie, MD*
Peter J. Pappas, MD

Educational Objectives: At the conclusion of this session, participants should be able to:

1. Learn new techniques of functional evaluation of the lymphatic system of lower extremity.
2. Select an appropriate compression for prevention of recurrence of venous ulcers.
3. Apply evidence-based methodology for compression treatment of venous.

1:55 PM – 2:15 PM **29. A Novel Method of Measuring Human Lymphatic Pumping in Healthy and Lymphedematous Legs Using Indocyanine Green Fluorescence Lymphography**

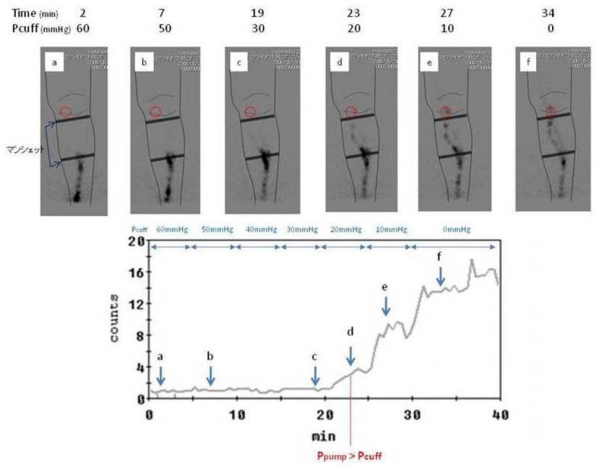
N. Unno[1], M. Nishiyama[1], M. Suzuki[1], N. Yamamoto[1], H. Tanaka[1], D. Sagara[1], Y. Mano[1], Y. Mano[1], M. Sano[1], H. Konno[2]
[1]Division of Vascular Surgery, Hamamatsu University School of Medicine, Hamamatsu, Japan; [2]Second Department of Surgery, Hamamatsu University School of Medicine, Hamamatsu, Japan

BACKGROUND: The lymphatic system possesses numerous active pumps to propel lymph to the central lymphatic systems. Decreased pumping activity may be associated with lymphedema. However, there were no no-invasive methods to measure lymphatic pump force in clinical practice. The aim of this study is to introduce a new method to measure lymphatic pumping and compared the activity between healthy and lymphoedematous legs using Indocyanine green (ICG) fluorescence lymphography.

METHODS: ICG fluorescence lymphography was performed by subcutaneously injecting 0.3 ml of ICG (10% in normal saline) into the dorsum of the foot. Fluorescence images were obtained with an infrared-light camera system in a supine position. Sphygmomanometer cuffs was wrapped around the lower leg and connected to a standard mercury sphygmomanometer. The cuff was inflated to 60 mmHg, then, gradually deflated to lower the pressure by 10 mmHg steps until the fluorescence dye exceeded the upper border of the cuff, when the lymphatic contraction overcome the cuff pressure. The value of the cuff pressure was taken as lymph pumping pressure (Ppump) (Figure.1). In nine volunteers without swollen legs (eighteen legs), we compared the Ppump obtained with ICG fluorescence lymphography to that obtained with dynamic lymphoscintigraphy. With dynamic lymphoscintigraphy, Ppump was measured

Fig.1

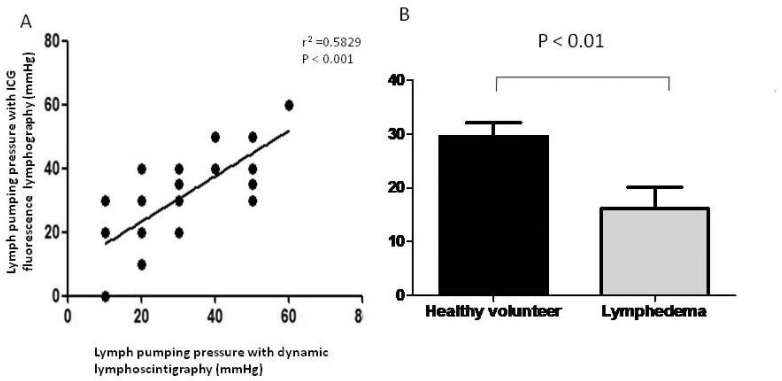
Fig.2



from the time-activity curves using the same sphygmomanometer cuff technique (Figure 2). With ICG fluorescence lymphography, we compared Ppump between twenty-seven healthy volunteers (fifty-four legs) and twenty-two lymphedema patients (twenty-six swollen legs).

RESULTS: A significant correlation between Ppump with ICG lymphography and dynamic lymphoscintigraphy was identified ($r^2 = 0.58$, $p < 0.001$) (Figure 3A). In lymphedematous legs, Ppump was significantly lowered compared to that in healthy legs (16.2 ± 4.0 mmHg, 30.0 ± 2.5 mmHg, respectively, $p < 0.01$) (Figure 3B).

Fig.3



CONCLUSIONS: Ppump measurement with ICG fluorescence lymphography is easily applied at bedside. This novel method enables real time measurement of lymphatic pumping in the extremities. In lymphoedematous legs, an impaired lymphatic pump may be involved in the pathogenesis of lymphedema.

2:15 PM – 2:35 PM **30. Inelastic Compression Is Effective Over Time in Spite of Significant Pressure Drop**

G. Mosti[1], H. Partsch[2]
[1]*Clinica MD Barbantini, Lucca (LU), Italy;*
[2]*Private Practice, Wien, Austria*

BACKGROUND: Inelastic compression has been claimed to lose effectiveness in a few days due to its fast pressure loss. The aim of our work was to compare the improvement of venous pumping function achieved by inelastic bandages worn for one week with the effect of a compression stocking kit in relation to the drop of sub-bandage pressure.

METHODS: In 18 patients affected by bilateral severe great saphenous vein insufficiency (CEAP C2–C5) ejection fraction (EF) was measured by strain gauge plethysmography[1] before, immediately after application of compression and one week later. A medical compression stocking kit (MCS) consisting of two stockings donned over each other was applied on one leg, an inelastic bandage on the other leg. The interface pressure was measured about 12 cm above the inner ankle in the supine and standing position and during exercise.

RESULTS: Results are summarized in the following table.

	Elastic stocking kit			Inelastic bandage		
	Baseline	**Application**	**7 Days**	**Baseline**	**Application**	**7 Days**
ejection fraction (%)	32.9	42	40.1	33.4	77.9	64.5
IQR	23.4–41.2	39.7–44.2	35.6–46.7	18.1–39.1	69.4–100	57.9–73.8
% increase		37.2	32.3		138	90
supine pressure		45	42		64.5	30.5
IQR		41–49	39–46.2		61–80	28–33.2
peak pressure		49	46		103.5	61
IQR		44–51	42.7–48.5		98.2–113.5	54.7–65.7
% pressure loss supine			5.6			54.7
% pressure loss peak			3.9			39.6

Compared with normal values of EF [64.6% (IQR 63.3–68.5)] median initial values were highly significantly reduced in both legs without compression. They increased moderately after application of MCS and strongly with inelastic bandages (both $p < 0.001$). 7 days later EF was reduced in both groups: slightly with MCS, more, but still in the normal range, with bandages. At both terms, at application and 7 days later, the percent increase of EF was significantly higher for the bandages compared to the MCS ($p < 0.0001$).

At application the median supine and standing interface pressure and walking amplitudes were significantly higher under the bandage than under MCS. After

7 days the percent pressure loss in supine and standing position and the pressure peaks during walking were much lower under MCS than under the inelastic bandage.

CONCLUSIONS: Inelastic bandages applied with initially high resting pressure keep their beneficial hemodynamic efficacy over one week despite of loosing sub-bandage pressure to about one half, probably due to the high pressure peaks (exceeding 60 mmHg) during exercise. The improvement of the venous pump by compression stockings is much less pronounced, both at application and one week later, despite of a better maintenance of both supine and peak pressure range.

2:35 PM – 2:55 PM **31. A Randomized Trial of Class 2 and Class 3 Elastic Compression in the Prevention of Recurrence of Venous Ulceration**

D.J. Milic, S.S. Zivic, D.C. Bogdanovic, M. Pejic, Z. Roljic, M. Jovanovic
Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia

BACKGROUND: Venous leg ulcers (VLU) are a major health problem because of their high prevalence and associated high cost of care. An estimated 1.5% of European adults will suffer a VLU at some point in their lives. Despite the widespread use of compression stockings recurrence rates are high and range between 25–70%. Numerous studies have suggested that regular use of compression stockings reduces VLU recurrences. However, there are limited data concerning two important questions: for how long should compression hosiery be worn after ulcer healing and which class of compression hosiery achieves better results in the prevention of VLU recurrences.

METHODS: An open, prospective, randomized, single-center study, with a 3-year follow-up, was performed in order to determine the efficacy of two different strengths of compression hosiery (Class 2 and Class 3) in the prevention of VLU recurrences. Three hundred and thirty eight patients (192 men, 146 women; mean age 58 years) with recently healed venous ulcers and no significant arterial disease, rheumatoid disease, or diabetes mellitus, were randomized into 2 groups:

Group A) 173 patients who were wearing a heelless open-toed elastic class III compression stockings, and

Group B) 165 patients who were wearing a class 2 elastic stockings.

Patients were instructed to wear compression stockings during the first year of the follow-up during day and night and in the second and the third year of the follow-up patients were instructed to wear elastic stockings only during the day. One pair of elastic stockings was changed every four months. The main outcome measures were recurrence of leg ulceration and compliance with treatment.

RESULTS: Eleven patients did not comply with their randomized compression class, 8 (4.6%) in class 3 and 3 (1.8%) in class 2. Overall, 28.4% (93/327) of patients had recurrent leg ulceration by 3 years. Recurrence occurred in 34 (20.6%) of 165 class 3 elastic compression cases and in 59 (36.4%) of 162 patients of class 2 compression cases. It is interesting that 26 recurrent VLU (28%) developed not at the primary site of the ulcer but below the medial malleolus, indicating possible insufficient level of compression at that point.

CONCLUSIONS: The results obtained in this study suggest that class 3 compression stockings provide statistically significant lower recurrence rate compared to class 2 compression stockings. It may be prudent to advise patients to wear a lower class of compression stockings during the night and to wear elastic stockings of higher compression during the day.

2:55 PM – 3:00 PM **Poster Winner #3**

3:00 PM – 3:15 PM **Coffee Break**

3:15 PM – 5:00 PM **ASK THE EXPERTS**
Venous Thrombolysis
Moderator: *Antonios P. Gasparis, MD*
Panelists: *Suresh Vedantham, MD*
Tilo Kölbel, MD
Niels Baekgaard, MD

Educational Objectives: After completion of this session, the participant will be able to:

1. Understand the management of acute deep vein thrombosis using early clot removal.
2. Discuss decision algorithm in patients with Iliofemoral thrombosis.
3. Understand technical aspects of catheter directed thrombolysis and pharmaco-mechanical thrombolysis as presented through case presentations.

5:00 PM **Adjourn**

7:30 PM – 10:00 PM **THE FORUM FINALE**
Awards, Dinner, Entertainment & More!

POSTER PRESENTATIONS

P1 Is the Difficulty in Putting on Compression Stockings a Reason for Patients Not to Wear Them?

J. Benigni, Sr.[1], J. Pibourdin, Jr.[2], N. Rahhali, Jr.[3], C. Taieb, Sr.[3]
[1]SFP, Paris, France; [2]PFS, Castres, France; [3]PFSA, Boulogne Billancourt, France

BACKGROUND: The difficulty of putting on compression stockings (CS), which lowers the effectiveness of the treatment, is often cited when discussing patient non-compliance. For the time being, no evaluation has been carried out that allows the situation to be clarified.

METHODS: A representative sample of French women (35 to 60 y) suffering from CVD and having purchased, over the past 3 months and with medical prescription, graduated CS was selected by the CSA Santé Institute. It was a national sample from all over France. The recruitment and identification was carried out with the help of dispensing pharmacists who know about delivering CS.

RESULTS: 126 women were included; the CS were delivered less than one month prior for 47.6% of them, between 1&2 months for 36.5% and between 2&3 months for 15.9% of our sample. If 100% declare having worn the CS at least once since being delivered, 43.65% declare having stopped wearing their stockings since they were given to them. A significant correlation between the prevalence of stopping and the date of the delivery can be observed.

Table 1	Total		1 month		2 months		3 months		P value
	N	%	N	%	N	%	N	%	Chi²
Have you stopped wearing your support stockings/tights?									
Yes	55	43.65	16	26.67	27	58.70	12	60.00	0
No	71	56.35	44	73.33	19	41.30	8	40.00	0.001
Total	126	100.00	60	100.00	46	100.00	20	100.00	0.001

Table 2	Total		Non-prevention population		"Prevention" population		P value
	N	%	N	%	N	%	Chi²
Have you stopped wearing your support stockings/tights?							
Yes	55	43.65	32	35.56	23	63.89	0
No	71	56.35	58	64.44	13	36.11	0.004
Total	126	100.00	90	100.00	36	100.00	0.004

Table 3	Total		Non-prevention population		"Prevention" population		P value
	N	%	N	%	N	%	Chi²
Due to the difficulties in putting them on did you give up wearing your support stockings/tights?							
Yes	36	28.80	27	30.34	9	25.00	0
No	89	71.20	62	69.66	27	75.00	0.551
Total	125	100.00	89	100.00	36	100.00	0.551

So as to avoid criticism, the subjects used CS for a prevention reason (phlebitis: 14.29%, prevention of leg edema during travel: 15.87%), a sub-group excluding the subjects with this indication was formed Table 2. Within the non-prevention population, the prevalence of stopping remains high and exceeds the threshold of one in three wome. In our evaluation 52% declared that, "in general, putting the stockings on seemed difficult or very difficult." Is the difficulty in putting the stockings on a reason not to wear them? It is a legitimate question because renunciation leads to misuse and needless spending.

Almost one in 3 women declared renouncing wearing the graduated stockings due to the difficulties in putting the stockings on. For this question we have also excluded the prescription of stockings linked to prevention. Table 3.

Confirmation of the prevalence of higher renunciation in the sub population intending to use the support over time can be observed.

CONCLUSIONS: Few data can be found in literature regarding difficulty of putting oon CS. These data are contradictory in terms of incidence. Any product that helps improve putting on the stockings by making the act easier would enable a significant decrease in renunciation and would improve efficiency, all the more so as the average number of units issued in the population is 1.76 unit (no difference between the 2 groups).

P2 Arteriovenous Fistula After Endovenous Ablation of the Great Saphenous Vein-Long Term Follow-Up

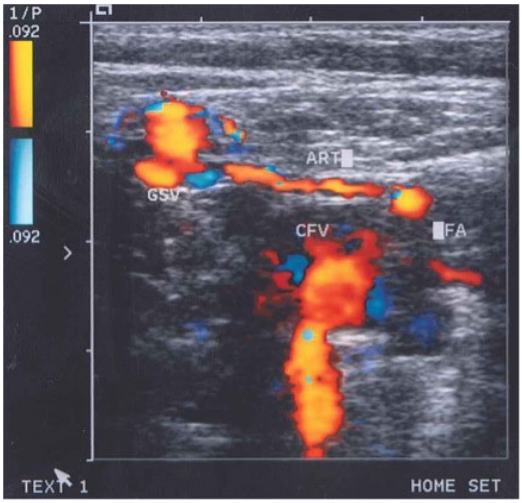
T.L. Berland, T.R. Shah, L.S. Kabnick, N.S. Cayne, T.M. Maldonado, C.R. Rockman, G.R. Jacobowitz, M.A. Adelman
NYU, New York, NY

BACKGROUND: Endovenous ablation of the great saphenous vein (GSV) is becoming the mainstay of treatment for symptomatic varicose veins in the setting of GSV valvular incompetency. We report two cases of an asymptomatic arteriovenous (AV) fistula between the saphenofemoral junction (SFJ) and a branch of the femoral artery that were discovered on post-procedure imaging. One occurred after radiofrequency (RF) ablation, and the other after laser ablation of the GSV.

METHODS: Both patients had symptomatic swelling and edema along with documented incompetency of their GSV system pre-ablation. The first patient underwent radiofrequency ablation of the GSV, and the second patient underwent laser ablation with a 1320 nm wavelength laser. Both ablation procedures were initiated approximately 2 cm from the SFJ.

RESULTS: Both patients had successful ablation and meticulous follow-up; both patients developed an arteriovenous fistula between the GSV and external pudendal artery which courses posterior to the GSV. The first patient had continued GSV occlusion with an otherwise normal duplex at one week and one year post procedure. However, at two years post procedure, pulsatile flow in the SFJ with evidence of arterialized waveforms consistent with an AV fistula was noted on duplex imaging. Four years after this (six years post ablation), the patient remains asymptomatic with a partially recanalized GSV in the proximal thigh. The other patient was treated with laser ablation, and the AV fistula was first noted on duplex imaging six months post-procedure. This patient remains asymptomatic with a persistent AV fistula, but completely thrombosed GSV three years post-ablation.

CONCLUSION: Latrogenic arteriovenous fistula creation is a possible complication of both endovenous laser ablation and RF ablation of the GSV. The natural history of this rare phenomenon is largely unknown. Careful attention must be paid to the most proximal portion of the laser fiber or RF catheter, and if an external pudendal arterial branch can be visualized on peri-procedural ultrasound, consideration to pulling the fiber back an additional centimeter prior to ablation should be considered.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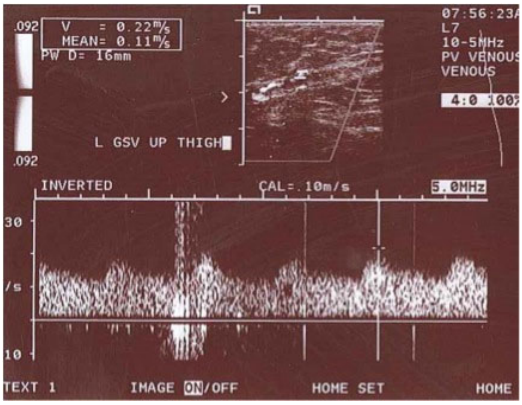
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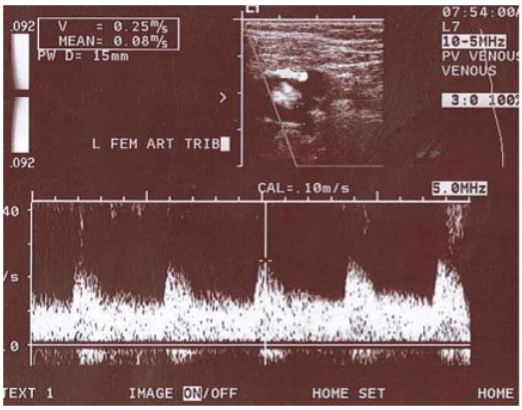
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/s
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P3 Is There a Relationship Between Increased Body Mass Index and Severity in Primary Venous Disease and Concomitant Primary Deep Venous Reflux?

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BACKGROUND: The role of overweight in chronic venous disease is still controversial. The aim of this study was to evaluate the impact of overweight in chronic primary venous disease in relation to disease severity, using the CEAP and VCSS as well as well as bodyweight on the presence of concomitant primary deep venous reflux.

METHODS: Between October 2005 and September 2009, 1226 patients (1800 limbs) presenting with duplex-ultrasound confirmed chronic primary venous disease were evaluated from a database. The patients were classified according to CEAP, the venous clinical severity score (VCSS) and body mass index (kg/m^2), using the WHO definition). Concomitant primary deep venous reflux was evaluated and reexamined following eradication of the superficial reflux.

RESULTS: There were 535 normal weight patients (781 limbs), BMI <25, 454 overweight patients (658 limbs), BMI 25 to 29.9, and 237 obese patients (361 limbs), BMI ≥30 kg/m^2. Overweight patients had more incompetent perforators ($p < 0.001$), hypertension and diabetes ($p < 0.001$) than normal weight patients and higher C-class and VCSS ($p < 0.001$). Obese patients had more incompetent perforators ($p < 0.001$), hypertension ($p < 0.001$), diabetes ($p = 0.035$) and primary deep insufficiency ($p < 0.002$) than overweight patients as well as higher C-class and VCSS ($p < 0.001$). Correlation between the C-class (CEAP classification) and the severity score (VCSS) was found excellent ($r = 0.87$). Obese patients had more axial reflux than the two other groups. There was no relationship between disease duration, bodyweight, and severity within each group. After eradication of superficial reflux abolition of the deep reflux was lowest among obese patients (9.2%) compared to overweight patients, 34.4% ($p = 0.035$).

CONCLUSIONS: There was a close relation between bodyweight and clinical severity of primary venous disease. Both overweight and obesity appears to be a separate risk factor for increased severity in patients with chronic primary venous disease without correlation to disease duration. CEAP and VCSS seem to accurately evaluate disease severity with an excellent correlation between the two scores. Concomitant primary deep venous reflux is more often observed in the obese patients, with less abolishment following eradication of the superficial reflux than observed for normal weight and overweight patients.

P4 Role of PAI-1 in Deep Vein Thrombosis in a Murine Model

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BACKGROUND: Hyperlipidemia increases the levels of plasminogen activator inhibitor-1 (PAI-1) which regulates fibrinolysis by inhibiting urokinase and tissue-plasminogen activator (t-PA), two serine proteases that catalyze the conversion of plasminogen to plasmin. While this fibrinolytic pathway is well known, the role of PAI-1 in deep vein thrombosis has not been fully established. We sought to determine the effects of PAI-1 in an in vivo model of DVT.

METHOD: C57BL/6 (WT), Apo-protein E (ApoE) KO and PAI-1 knock out (KO) mice were used. Inferior vena cava (IVC) ligation below the level of the renal vein was performed to create a stasis DVT. Mice were harvested at 2, 6 and 14 days after surgery. At sacrifice, blood samples were collected for plasmin activity assay, active PAI-1, total PAI-1 antigen and microparticles (MP). In addition, the IVC/thrombus was harvested and thrombus weight (TW) in grams was assessed.

RESULTS: Mean TW was higher in ApoE KO and lower in PAI-1 KO mice compared to WT when group comparisons were made at all time points (d2: $p = 0.0092$, d6: $p < 0.0001$, d14: $p < 0.0001$. ANOVA) (Figure 1). Plasmin levels were lower in ApoE KO and higher in PAI-1 KO mice when compared with WT at days 2 and 6 (d2: $p = 0.0342$, d6: $p = 0.1246$, d14: $p = 0.0298$. ANOVA) (Figure 2). PAI-1 total and active levels were higher in ApoE KO compared to WT and non detectable among PAI-1 KO mice (d2: $p = 0.0058$, d6: $p = 0.5892$. ANOVA) (Figure 3). Platelet and leukocyte derived MP counts were reduced among ApoE KO and increased in PAI-1 KO mice compared to WT (Figure 4).

CONCLUSIONS: PAI-1 most likely plays a major role in DVT resolution. Increased PAI-1 activity and decreased plasmin levels resulted in larger thrombus in the hyperlipidemic ApoE mice, suggesting impaired fibrinolytic activity. Decreased numbers of MP correlate with larger thrombi and may be due to consumption within the thrombus in ApoE mice. Further studies are warranted to demonstrate the clinical impact of these findings.

Supported by NIH 1PO1HL089407

Figure 1

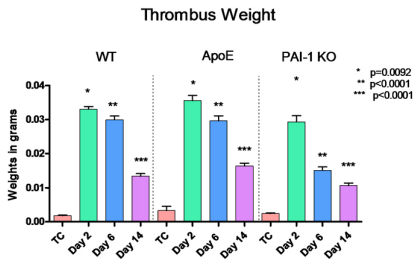


Figure 2

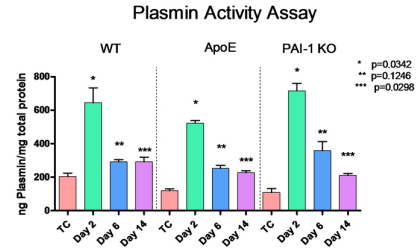


Figure 3

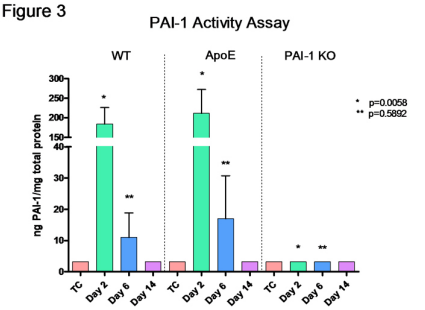
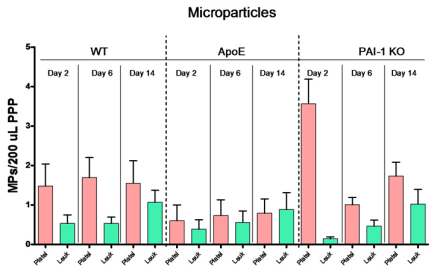


Figure 4



P5 Contemporary Management of Giant Renal and Visceral Arteriovenous Fistulae

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BACKGROUND: Giant arteriovenous fistulae (AVF) involving the renal and visceral vasculature are rare. The extremely high blood flow-rate through these AVFs makes both surgical and endovascular treatment hazardous. The aim of this study was to evaluate our experience with open and endovascular treatment of these lesions and assess outcomes.

METHODS: Clinical data from 12 consecutive patients undergoing intervention for giant renal/visceral AVFs over a 15 year period (1994–2008) were retrospectively reviewed. Only patients with extraparenchymal, single, wide AV communications were included.

RESULTS: There were 2 males and 10 females (median age 53 years; range 37-79) with 14 giant AVFs. These included 13 renal and one splenic AVF, 2 patients had bilateral renal involvement. Etiology was post-traumatic/iatrogenic in 6, idiopathic in 5, congenital in 2 (1 patient) and fibromuscular dysplasia in 1. Four lesions were asymptomatic; symptoms in the remainder included flank pain in 5, congestive heart failure in 2, hemorrhage in 2 and portal hypertension in the patient with the splenic AVF. Duration of the AVFs ranged from 3 days (iatrogenic following nephrostomy) to 35 years in the patient with bilateral congenital renal AVFs. Two patients with the largest renal AVFs in the series underwent surgical intervention; one fistula ligation and the other nephrectomy for rupture. Twelve fistulae were ablated by percutaneous endovascular intervention; large diameter coil embolization in 8, covered stent placement in 1 renal AVF and 20 mm Ampltaz® device occlusion in the splenic AVF. All procedures were performed solely through the feeding artery without cannulating the draining vein and were successful in completely ablating the AV communication and providing relief of symptoms. There was no mortality; morbidity included 2 access site hematomas managed conservatively. Loss of parenchyma secondary to intervention ranged from 10% to 50%, but median Serum Creatinine remained stable at 0.8 mg/dL (range 0.7 to 1.6).

CONCLUSION: Endovascular treatment of giant renal / visceral AVFs is feasible and safe when performed selectively with large diameter coils or plugs. It is a viable alternative to open surgical repair as the first line of treatment for these challenging lesions.

P6 Mechanical and Pharmacologic Catheter Directed Thrombolysis Treatment of Severe, Symptomatic Bilateral Deep Vein Thrombosis with Congenital Absence of the Inferior Vena Cava

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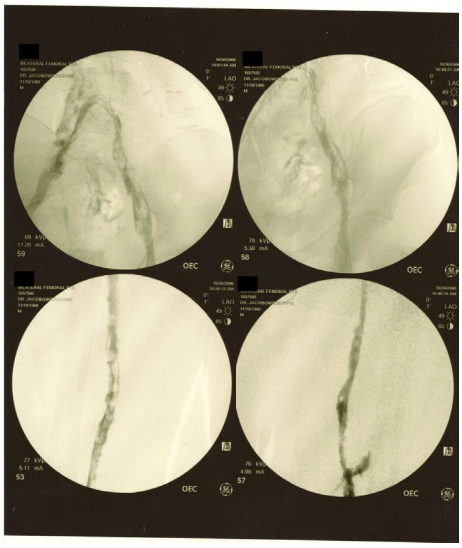
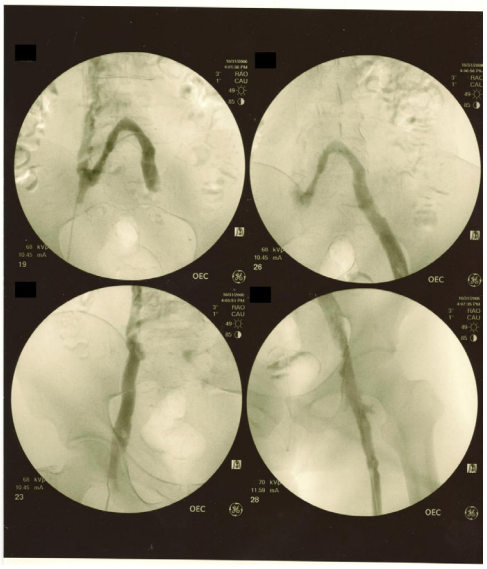
NYU Medical Center, New York, NY

BACKGROUND: We describe the case of a 25 year old male presenting with severe, disabling bilateral lower extremity swelling and pain, found to have extensive bilateral ilio-femoral deep vein thrombosis (DVT), and congenital absence of the inferior vena cava (AIVC). Genetic testing revealed a Factor V Leiden mutation. Patient underwent mechanical and pharmacologic catheter directed thrombolysis with tPA.

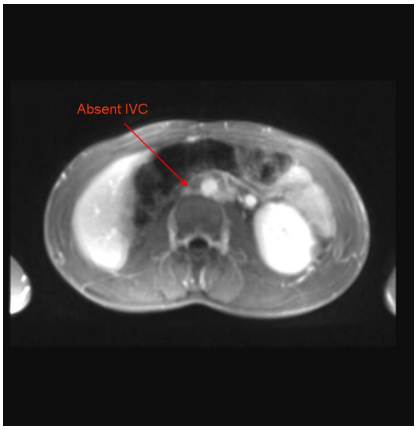
METHODS: Using ultrasound guidance, the popliteal vein was accessed bilaterally and access to the iliac vessels through the clotted veins was obtained through a glidewire. Extensive thrombus was noted extending up from the popliteal to the common iliac veins bilaterally. Using a *Possis* catheter, TPA was pulse sprayed throughout the entire clot bilaterally, 5 mg per side, followed by advancement of a *Possis* catheter for clot thrombectomy. Venography demonstrated continued presence of residual clot. Infusion catheters were left in place for 24 hours with tPA infusing at 1 mg/hr per catheter. Additional imaging demonstrated resolution of thrombus and once again a *Possis* catheter was passed through the residual clot. Good flow was noted throughout the venous system from popliteal veins to the iliac confluence. The patient was systemically heparinized and the tPA infusion was discontinued.

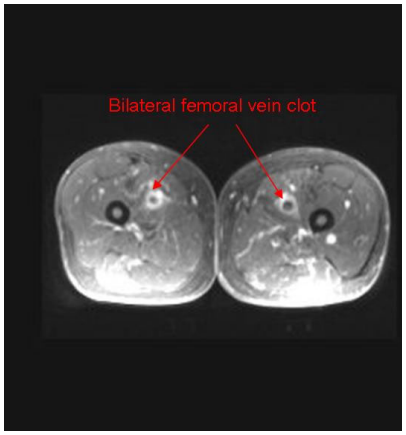


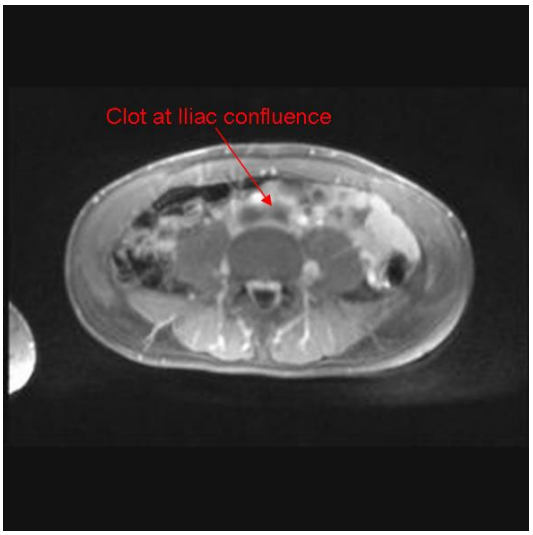


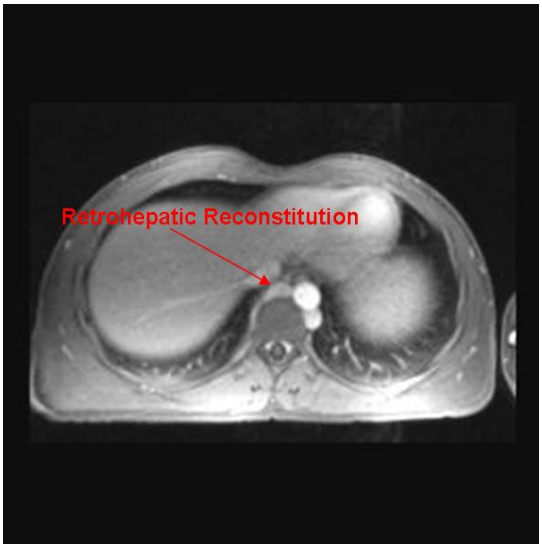
RESULTS: The patient tolerated the procedure well, with prompt return to daily activities. Patient has been managed on anticoagulation as an outpatient and followed with venous duplex for last three years with no evidence of DVTs.

CONCLUSIONS: In patients with AIVC and symptomatic DVT without improvement on anticoagulation, catheter directed thrombolysis can achieve rapid clot dissolution and return to baseline venous outflow and resolution of symptoms.






Clot at Iliac confluence


Retrohepatic Reconstitution

P7 Prosthetic Polymer Vein Valve: Initial Results in Animal Studies

N. Gupta[1], P.A. Midha[2], J. Weaver[2], J. Reeves[1], E.L. Chaikof[1], P. Halandras[1], R. Milner[1], D.N. Ku[2]
[1]*Emory University School of Medicine, Atlanta, GA,*
[2]*Georgia Institute of Technology, Atlanta, GA*

BACKGROUND: Venous insufficiency afflicts one third of adults, and incompetence of proximal deep venous valves is a contributory factor. Surgical options for an incompetent saphenofemoral valve yield poor results and require long-term anticoagulation. We report the short-term results of an endovascularly delivered, polymer prosthetic valve implanted in sheep with no anticoagulation.

METHODS: 4 prosthetic vein valves constructed from the flexible polymer poly (vinyl alcohol) (PVA) were inserted in the external jugular veins of sheep using an endovascular delivery system after venous cutdown. The CDA designed valves are 10 mm in diameter and have radio-opaque markers to allow for positioning under fluoroscopy. The animals were administered 325 mg aspirin for one week before surgery and continued on the same dose postoperatively. Patency and competency of the vein valves was followed clinically and confirmed by weekly venograms.

RESULTS: 2 of the 4 valves were patent with an average follow-up of 20 days (range 7–33). One valve remained patent till 33 days, while the other occluded at 19 days after implantation. Two valves remain patent with continued competence on retrograde venography. There were no complications following insertion. The median length from cutdown to implantation site was 15.5 cm and the incision size averaged 2.7 cm. Occluded valves were filled with loose red clot in the devices with irregular stent-material surfaces due to hand manufacturing.

CONCLUSIONS: This preliminary data on patency and competence of low-thrombogenicity PVA valves implanted in sheep given aspirin alone is a promising option for replacement of incompetent valves at the saphenofemoral junction. Larger scale animal studies are required to identify causes for early failure as well as possible design and delivery system refinements.

P8 Nutcracker Syndrome: From Stenting to Laparoscopic Reimplantation of the Left Renal Vein Into the Inferior Vena Cava

O. Hartung, A. Azghari, P. Barthelemy, M. Boufi, Y.S. Alimi
CHU Nord, Marseille, France

BACKGROUND: We herein present our long-term results of stenting for nutcracker syndrome and our early experience with laparoscopic left renal vein reimplantation into the inferior vena cava.

METHODS: From November 2002 to 2009, 7 women, median age 36 years (range 30–54) were treated for nutcracker syndrome. All but one had had previous pregnancies. 6 suffered from incapacitating pelvic congestion syndrome (2 had prior left renal vein embolization) associated with left lumbar pain in 4 and with microscopic hematuria in 3. The last patient had a congenital solitary left kidney and suffered from left lumbar pain and macroscopic hematuria since childhood. All patients had a preoperative work-up excluding other etiology for their symptoms. Duplex scan, computed tomographic scan, and iliocavography revealed left renal vein compression, with proximal distention and collateral pathways, with dilatation and permanent reflux in the left ovarian vein in the five patients who had not had prior embolization. The mean renocaval pull-back gradient was 5 Hg (range 4–6).

RESULTS: Five patients had stenting of the left renal vein before 2005 with a median length of stay of 2 days (range 1–10) and good result at one month. After a median 64 months follow-up (range 58–81), one patient is asymptomatic with a patent stent. 2 patients had recurrence of the nutcracker syndrome due to stent displacement: one had stent resection and reno-caval bypass 11 months after stenting, the other one is moderately symptomatic. The 2 other patients have persisting pain.

Two patients were scheduled for laparoscopic reimplantation of the left renal vein into the IVC. The fist one needed a 4cm long supra umbilical laparotomy to perform the anastomosis into the IVC but the second one had a totally laparoscopic procedure. They were discharged respectively at day 3 and 2, both under oral anticoagulant. After 10 and 6 month of follow-up, both patients are asymptomatic with patent reconstruction of the left renal vein without restenosis or residual obstruction.

CONCLUSIONS: Long term results of stenting for nutcracker syndrome are not as good as expected. Laparoscopic reimplantation of the left renal vein is feasible with short length of stay and good short term results.

P9 Is it Necessary to Perform Fasciectomy in Patients Presenting with Leg Compartment Syndrome Due Functional Popliteal Vein Entrapment Syndrome?

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BACKGROUND: Chronic recurrent exertional compartment syndrome (CRECS) can be due to functional popliteal vein entrapment (FPVE). We herein review our experience in order to determine if fasciectomy can be selectively avoided.

METHODS: From March 2003 to May 2008, 273 limbs in 142 patients practicing endurance sports were treated for CRECS. Of these, 138 limbs in 71 patients (56 male, median age 27 years, range 15–49) had FPVE. It was associated to functional popliteal artery entrapment (FPAE) in 73 limbs. All patients had normal ABI at rest. The diagnosis was made by duplex-scan and static and dynamic pressure measurements on limbs compartments. In sitting position in case of pressure > 60 mmHg in the anterior lateral compartment with dorsal flexion of the foot and/or >45 mmHg in the posterior deep compartment with plantar flexion and/or absence or incomplete pressure decrease at 10 minutes after tread mill we decided to perform fasciectomy. At the end of the follow-up all patients were interrogated to evaluate their degree of satisfaction and their ability to practice sport.

RESULTS: All procedures were performed under general anesthesia. All limbs had phlebolysis and arteriolysis associated to resection of plantaris muscle through a posterior popliteal approach. 69 limbs (36 patients) had only this treatment. Fasciectomy was added on the pathologic compartments in 69 limbs (35 patients): anterior lateral 59, posterior superficial 63 and posterior deep with section of the solaris muscle on its tibial attachment 61. Median postoperative length of stay was 1 day (1–2) in patients without fasciectomy versus 3 days (1–4) in patients with fasciectomy. Six postoperative complications occurred, all in patients who had fasciectomy: 3 hematomas requiring reintervention, 2 deep venous thrombosis (one sural and one peroneal) and 1 deficit of the common peroneal nerve. At one month 2 patients had lymphocela on the popliteal approach. Moreover, 3 limbs which had initially isolated posterior approach had fasciectomy lately for persisting symptoms.

Twenty-one patients (40 limbs) were lost after the 1 month follow-up. Median follow up was 33 months (3–75). Result was good with improvement of physical capabilities in respectively 68% of limbs with isolated posterior approach and 73% of limbs with posterior approach and fasciectomy.

CONCLUSIONS: Functional popliteal vein entrapment syndrome can cause chronic recurrent exertional compartment syndrome. In case of low pressure increase while seated or of pressure decrease at 10 minutes rest after exercice, associated fasciectomy is not needed.

P10 Outcome of Internal Valvuloplasty with Additional Procedures for Chronic Venous Insufficiency

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BACKGROUND: We have performed internal valvuloplasty with additional procedures for chronic venous insufficiency (CVI) since 1997. The results were analyzed.

METHODS: Valvuloplasty with additional procedures (high ligation and sirpping of great saphenous vein etc.) was performed in 45 limbs of 41 patients with CVI between February 1997 and March 2009. They consist of 13 men and 28 women with a mean age of 61 years. Their clinical classification showed CEAP 3-6 (mean 4.2). The indication of valvuloplasty was severe incompetence of the femoral vein (more than grade 3 by descending venography). Internal valvuloplasty was performed according to the methods described by Kistner in 1968. However, the longitudinal incision over the femoral vein was just above the valve. After the procedure of valvuloplasty, the valve competence was estimated by using intraoperative angioscopy.

RESULTS: The symptoms of all patients were improved. In 7 patients with leg ulcers, the ulcer free rate was 100% and 75% at 1 and 2 years respectively. After the surgery, the reflux of the femoral vein by descending venography was improved from grade 3.3 to 1.3. The venous filling index by air plethysmography was also improved from 7.9 ml/sec to 4.3 ml/sec. Deep vein thrombosis was occurred in two patients on the postoperative 14^{th} day.

CONCLUSIONS: Internal valvuloplasty with additional procedures was an effective treatment option for CVI under strict indication. However, postoperative deep vein thrombosis should be avoided by antithrombotic therapy (oral warfarin for one month after surgery).

P11 The Wound Healing Response of Venous Leg Ulcers to Out-Patient Pulsed Radio Frequency Energy Treatment: Analysis of An 80-Wound Registry

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Regenesis Biomedical, Inc., Scottsdale, AZ

BACKGROUND: Pulsed Radio Frequency Energy (PRFE*) has been used to treat chronic, non-healing wounds since 2004. PRFE devices emit a fixed dose of non-ionizing, non-thermal radio frequency energy, transmitted via an applicator pad placed adjacent to the wound. Treatment is self-administered at home or in facility. Case reports have shown benefit in the adjunctive treatment of diabetic foot ulcers and pressure ulcers. This case series examines wound healing outcomes in a series of 80 venous leg ulcers.

METHODS: 66 consecutive patients receiving treatment with PRFE for Venous Leg Ulcers were registered into a wound database between 2005 and 2008. Cases originated from 39 US out-patient centers. Most wounds had been unresponsive to previous therapies. Data collected included subject age, gender, wound type and location, age of wound and dimensions. PRFE therapy was prescribed as an adjunct to standard wound care and assessed at 4 weeks.

RESULTS: 80 wounds were included in the analysis. Patients were elderly with median age 69 years (Min 32, Max 95), with complex co-morbidities. Wounds were chronic with median wound age 12.5 months (Min 0.25, Max 504), and large (median surface area 18.2 cm^2, Min 1.0, max 604.8). In the first month of therapy, wound surface area decreased by a median of 43.7%. Forty two percent (42%) of wounds reached 50% closure. The wound healing rate (SA/days) was 20.5 mm2/day, almost twice the rate among venous leg ulcers treated with standard care (11 mm2/day) in the control group of randomized trials.

Table 1: Patient and Wound Baseline Data

	N	Median	Min	Max
Age (years)	44	69	32	95
Gender (% male)	83.3%			
Wound Age (months)	70	12.5	0.25	504
Wound Area (cm^2)	80	18.12	1	604.75

Table 2: Response to PRFE Therapy

	N	Median	Min	Max
Median Trajectory (cm^2/day)	46	0.146	–2.21	6.43
Percent Change in Wound Area	46	43.7%	–117%	100%
≥50% Reduction in Wound Area	No = 26	Yes = 19	% Yes = 42%	

Table 3: Comparison of PWAR (Percent Wound Area Reduction) Results to Randomized Controlled Trials

Wound Type	Intervention	Median PWAR (# weeks)	Citation
VENOUS	PRFE	43.7 % (4 weeks)	This Study
	HBO	35.7% (6 weeks)	Hammarlund (1994)
	Dermagraft	81.4% (12 weeks)	Krishnamoorthy (2003)
	Control	–42.3% (increase at 8 weeks)	Stiller (1992)
		2.7% (6 weeks)	Hammarlund (1994)
		78.1% (12 weeks)	Krishnamoorthy (2003

CONCLUSIONS: Venous leg ulcers treated with Pulsed Radio Frequency Energy have a substantial reduction in size in the first 4 weeks, and heal at a rate almost twice that of wounds treated with standard, basic wound care.

P12 Visualized Sclerotherapy

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Osaka University Graduate School of Medicine, Osaka, Japan

BACKGROUND: The spread and movement of sclerosant following injection during sclerotherapy is difficult to monitor.

OBJECTIVE: This study aimed to develop a new visualization method that allows monitoring of sclerosant dosage and flow during sclerotherapy.

METHODS: We used a photodynamic eye (PDE) to perform indocyanine green (ICG) imaging. ICG produces strong fluorescence detectable by PDE, and allows monitoring of sclerosant spread through blood vessels in real time. We performed visualized sclerotherapy on 50 limbs, comprising high ligation and sclerotherapy (35 limbs), stripping and sclerotherapy (10 limbs), and sclerotherapy alone (5 limbs).

RESULTS: In all cases, fluorescence imaging of the injected sclerosant was possible. No complications resulted from combining ICG and polidocanol in any of the patients, all of whom received follow-up evaluations at 1 week, 1 month, and 3 months following treatment.

CONCLUSIONS: Our new method not only avoids the risk of radiation exposure, but allows for simple observation of sclerosant range of access, determination of the dosage for each lesion, and accurate administration of therapy to target lesions. This method will contribute to further advances in sclerotherapy given that it allows administration of sclerosant and visual confirmation of optimal injection dosage, speed, and movement of sclerosant following injection.

P13 Feasibility of Cryo Perforator Surgery of Incompetent Perforating Veins

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[1]Sint Franciscus Gasthuis, Rotterdam, Netherlands, [2]Academisch Ziekenhuis Maastricht, Maastricht, Netherlands

BACKGROUND: Treatment of incompetent perforating veins (IPV) could be beneficial in selected patients with chronic venous insufficiency. Cryo perforator surgery (CPS) is a minimally invasive procedure. It has shown in a prior study that CPS could be an effective surgical technique in the treatment of incompetent perforating veins (IPV). Adaptation of the cryoprobe with a diamond dust coating showed better results in vitro. A second study was performed to determine the efficacy and safety of CPS with the modified cryoprobe.

METHODS: All patients in this study had clinical complaints and duplex proven incompetent IPV of the lower leg, without superficial system incompetence. CPS consisted of percutaneous cryoprobe insertion in or near the IPV. The procedure was performed under tumescent anesthesia. All patients were advised to wear elastic stockings for 1 week after the procedure. Medical charts of all patients were reviewed prospectively. The efficacy of the procedure was determined with duplex ultrasound, 1 month after the procedure.

RESULTS: Eleven patients with clinical symptoms and IPV, documented by duplex ultrasound were treated with CPS. All patients were women, with a mean number of 1 IPV (range 1–3) and a mean diameter of 3.6mm (range 2.1–4.7). CPS was feasible in all patients. All patients had a post procedural duplex ultrasound. In 2 patients (18%) the treatment was successful with a total of 3 occluded perforating veins. In the remaining 9 patients (82%) the perforating veins were still incompetent. One complication occurred; a patient developed a persistent painfully paresthesia on the medial side of the lower leg. These results were reason to abort this study.

CONCLUSIONS: CPS cannot perform an abolition of IPV. It is a painful and difficult procedure with a disturbing success rate. CPS should be considered obsolete.

P14 Mid-Term Results of the PEARL (Peripheral Use of AngioJet Rheolytic Thrombectomy with Mid-Length Catheters) Registry for Deep Vein Thrombosis

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[1]*Mount Sinai Medical Center, New York, NY;*
[2]*Samaritan Vascular Institute, Dayton, OH;*
[3]*Chilton Memorial, Pompton, NJ*

PURPOSE: To report registry data in which deep vein thrombosis in lower and upper extremities were treated with rheolytic thrombectomy.

MATERIALS & METHODS: A voluntary registry of the Possis Angiojet catheter used in the treatment of 160 patients with upper and lower extremity DVT was examined. An electronic data capture case report form was filled out by physician and staff tabulating patient DVT history, procedural information, post-case device performance assessment and acute adverse events. Three month clinical follow up was obtained to document continued symptomatic improvement. Cases were performed over 30 months at 31 U.S. clinical sites.

RESULTS: A total of 160 patients were treated including 99 male and 61 female (mean age 51; range 18 to 86). 26 upper extremity and 134 lower extremity DVT cases were included. 126 patients (79%) reported symptoms of less than 14 days. Combination therapy using Power Pulse Spray or Rapid Lysis techniques were used in 86% of cases (138/1160). 85% of cases were completed in less than 24 hours, and 96% in less than 48 hours. Substantial or complete lysis was achieved in 93% of all venous segments treated. Adjunctive venous stent placement was performed in 42 patients (25%). Three month follow up was available for 130/160 (81%) of patients and 104 patients (80%) report continued symptomatic improvement.

CONCLUSION: Rheolytic thrombectomy combined with adjunctive measures form an effective and safe strategy for comprehensive vascular treatment of lower and upper extremity DVT.

P15 Untreated Varicose Veins Following Great Saphenous Vein Ablation Do Not Cause Recurrence

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BACKGROUND: It is a century-old tenet of varicose vein surgery that incomplete removal of surface varices will result in recurrences. The early results of this observational study were reported in 2005. At that time regression of varicose vein size was documented following radiofrequency ablation of the Great Saphenous Vein. The question raised was whether deferring treatment of the surface varices would result in the inevitable recurrence that our surgical principles predict.

METHODS: 45 patients, with 54 involved limbs, were the subjects of an observational study. There was no true control group, as this was not a randomized trial. Up to 5 varices on each leg were measured with calipers prior to treatment and at intervals following treatment. Great saphenous vein ablation was performed, followed by a minimum six month observation period. In 2008, patients were recalled for 5-year follow-up. 21 patients, with 26 involved limbs, were seen. Of those, 1 patient and 1 limb had further treatment of incompetent tributary and perforator veins with ultrasound-guided sclerotherapy, and 5 patients and 6 limbs underwent surface sclerotherapy for remaining varicose veins after the observation period. CEAP classification and VCSS were obtained for each limb.

RESULTS: Following radiofrequency ablation alone, subjective symptoms of pain, heaviness, etc. resolved in most patients. At 5 years, 4 limbs in 3 patients had recurrent varices. These were associated with untreated sources of reflux not specifically related to untreated varices. 11 patients had persistent varices which had not progressed since the patient was seen last.

CONCLUSIONS: It is observed that varicose veins will regress in size following radiofrequency ablation of the Great Saphenous Vein. Many of these veins become clinically insignificant. Leaving these veins untreated does not result in inevitable recurrence. This contradicts a long-standing principle of treatment of venous disease. A new principle might be asserted: Regression of varicose veins following elimination of underlying sources of reflux is to be expected, and has long-term durability. Modern ultrasound technology allows surveillance and treatment of persistent sources of venous reflux without the necessity of extensive extirpation. While this study employed a certain treatment strategy, the intent was not to establish one strategy over another. New strategies for treatment of varicose veins need to be imagined, planned, and tested with this observation in mind.

P16 Iliofemoral Venous Thrombosis from External Compression by a Vesical Diverticulum

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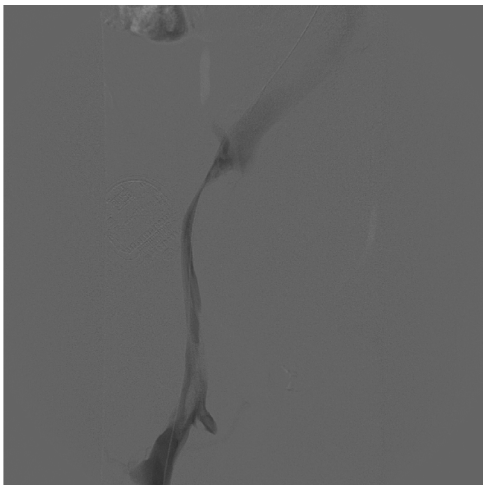
BACKGROUND: Despite knowledge of multiple risk factors for venous thromboembolism (VTE), 26% to 47% of these events are classified as idiopathic. Deep venous thrombosis (DVT) from external compression of the venous system by a variety of lesions has been reported in the literature. Prompt identification of such lesions, which are potentially modifiable, may obviate the need for prolonged anticoagulation and also prevent recurrence.

METHODS: We report a case of acute unilateral iliofemoral DVT caused by external compression from a vesical diverticulum. Only two such cases have been reported in literature.

RESULTS: A 70 year-old male was referred to vascular surgery service for worsening left ileo-femoral DVT while on therapeutic anticoagulation. Thrombophilia workup revealed no hypercoagulable state. He underwent catheter directed thrombectomy, thrombolysis, stenting of left external iliac vein and placement of an Inferior Vena Cava filter. Venogram revealed smooth stenosis of left external iliac vein, suspicious for external compression.



Computerized Tomography scan showed a mass in pelvis, arising from the urinary bladder, compressing the left external iliac. Micturating Cysto-Uretherogram showed a 4 cm bladder diverticulum at the left-lateral position.

Patient reported recent onset obstructive lower urinary tract symptoms and an enlarged prostate gland was found on rectal exam which was managed by cystoscopy and transuretheral resection of prostate.

CONCLUSIONS: The cornerstone of treatment of VTE is risk modification and anticoagulation. The duration of anticoagulation is dictated by the nature of VTE (DVT v/s PE), nature of risk factors (temporary, modifiable or non-modifiable) and recurrence of VTE. Although anticoagulation is effective in preventing recurrence, studies suggest that duration of anticoagulation does not affect the risk of recurrence once primary therapy for the incident event is stopped. Despite treatment, up to 30% patients develop recurrence over the next 10 years. Idiopathic VTE has been reported an independent predictor of recurrence. Thus, diagnosis of Idiopathic VTE commits patient to long term and often indefinite anticoagulation, which comes at the price of its own complications. Identification of external compression as cause of VTE requires a high index of suspicion. Pertinent history and physical examination may provide obvious clues to make the diagnosis. In absence of other well established risk factors for VTE, external compression of the venous system should be excluded before labeling the event to be idiopathic in nature.

P17 Withdrawn

P18 Risk Factors for Incidence of Varicose Veins, CVI in the Bonn Vein Study II

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OBJECTIVES: Chronic venous disorders are among the most common diseases in Germany. In the Bonn Vein Study I (BVS I), conducted in 2000, 3072 participants of the general population of the city of Bonn and two rural townships, aged 18–79 years were took part in this study (1350 men, 1722 women). Participants were selected via simple random sampling from the registries of residents. In this follow-up study 6.6 years later, the same population was investigated again to. The aim was to identify the incidence of newly developed chronic venous disorders and of progression of pre-existing CVD as well as the corresponding risk factors.

METHODS: From May 2007 to September 2008, we contacted all participants of BVS I and invited them for a reinvestigation. The participants answered a standardized questionnaire and were examined by clinical means and by duplex ultrasound in the same way as in BVS I.

RESULTS: The response at follow-up after 6.6 years was 84.6%. We reinvestigated 1978 participants. The incidence for new varicose veins and CVI was app. 2.0% per year. In a multivariate analysis the main risk factors for new VV were advanced age and positive family history, for new CVI age and obesity.

CONCLUSIONS: These results show a comparable incidence of app. 2% for varicose veins and for CVI per year but different risk factors.

P19 Does Compression Affect Superficial Veins More than Deep Veins?

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BACKGROUND: According to a phlebological dogma compression devices act more on superficial veins than on deep veins.

AIM: To investigate changes of venous cross sections in the superficial and deep venous system of the lower extremity under the influence of compression materials in different body positions.

METHODS: Magnetic resonance imaging (MRI, G-Scan®, Esaote, Genova) of superficial and deep veins in different body positions (supine, prone, upright) was performed in a total of 12 individuals (CEAP C0 in one, C2-C4 in 11). Compression stockings and compression bandages were applied and their local interface pressure was measured using a Picopress® pressure transducer. Cross sectional pictures were acquired over leg-segments which had been marked on the skin and the amount of venous narrowing in superficial and deep veins was compared by planimetry. Due to the restricted number of investigations with different variables the results are mainly based on single observations.

RESULTS: In the supine position the median area reduction in 9 individuals under compression was 52,5% (IQR 41–60,4) in the great saphenous vein and 51,3% (45,5–61,7) in the medial tibial posterior vein (n.s.). 6/9 individuals showed a more pronounced area reduction in the deep than in the superficial veins, independent from the compression pressure. In the prone position (n = 3) light compression stockings compressed deep veins more than superficial veins. In the standing position one patient showed a collapse of dilated muscle veins by a light stocking (22 mmHg), in another case the percent area reduction was about the same in superficial and deep veins.

CONCLUSIONS: The dogma that compression affects superficial veins more than deep veins has to be questioned. Changes of the body position together with external compression do not only affect the intravenous pressure but also cause tissue deformations, which need to be analysed in future studies.

P20 Varicose Vein Reccurence After Pregnancy: Influence of the Preservation of the Saphenous Vein in Nullipara Patients

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BACKGROUND: The pregnancy is a risk factor for recurrence after a surgical treatment of varices. The aim of this study is to evaluate the influence of the preservation of the saphenous vein (SV) for the treatment of varices, in nullipara patients who had a pregnancy following the treatment.

METHODS: We have included in this retrospective study the nulliparas who had a pregnancy following the first surgical treatment of varices (FSTV), leading to varicose recurrence (REVAS) and reoperation (REOP).

Two periods were compared:

- January 1998 to December 2002: the referent FSTV among nullipara patients consisted of ablation of the SV (T1).
- January 2003 to December 2007: the referent FSTV was phlebectomy with preservation of the SV (T2).

The extent of the treated varices was evaluated according to the number of zones treated (NZT) by phlebectomy, with each lower limb (LL) divided into 32 zones.

RESULTS: From Januray 1998 to December 2007 a total of 44 LLs were operated on in 33 patients who matched the criteria of inclusion. Among these patients, 19 have been operated on during T1 (cohort 1) and 14 during T2 (cohort 2).

The comparison of the population characteristics for the two cohorts at the time of FSTV showed no differences (Table 1).

Table 1: Charateristics of Population and Procedures for Cohort 1 and Cohort 2 at the Time of FSTV

	Cohort 1	Cohort 2	P
LLs	25	19	
Age (average)	30.8 y	28.7 y	NS
CEAP Class C2	96.0%	95.0%	NS
Presence of symptoms	72.0%	74.0%	NS
GSV reflux	88.0%	84.2%	NS
SV preservation	8.0%	78.9%	<.05

The mean time between the FSTV and the pregnancy was 26.0 months in cohort 1 and 18.7 months in cohort 2 (NS), and between the pregnancy an the REOP was 13.8 months in cohort 1 and 18.3 months in cohort 2 ($P < .05$).

The comparison of the two cohorts at the time of REOP showed a higher frequency of symptoms, redo surgery at the sapheno-femoral confluence, NZT and postoperative lymphatic complications in the cohort 1 (Table 2).

Table 2 : Charateristics of Population and Procedures for Cohort 1 and Cohort 2 at the Time of REOP

	Cohort 1	Cohort 2	P
LLs	25	19	
CEAP Class C2	90.9%	95.5%	NS
Presence of symptoms	79.1%	31.1%	<.05
Redo surgery at the sapheno-femoral confluence	52.0%	11.0%	<.05
NZT	7.6	6.1	<.05
Postop complication (lymphatic)	8.0%	0.0%	<.05

CONCLUSION: The surgical treatment of varices in nullipara patients by phlebectomy, with preservation of the SV, may make it possible to reduce the complexity, signs, and symptoms in the event of varicose vein recurrence after pregnancy.

P21 Sclerotherapy and Venular Venoscope Method for Treatment of Teleangiectasia

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BACKGROUND: Sclerotherapy of leg teleangiectasias were compared to subdermic venules sclerotherapy by simple venoscope guidance (only this venules were treated). Sclerotherapy is still considered as the golden standard treatment for teleangiectasias and small veins but It has a high incidence of complications. Treatment was done simply changing the location of the needle puncture, trying to close the venules flow of the vessels area by the usual sclerosant (Polidocanol-foam or liquid).

METHODS: A total of 100 consented female patients were enrolled in this program. The diameter of the treated leg veins were between 0,2 to 4 mm. Each patient was treated in one leg by the comparative method and the other leg by the venular method, consecutively. Sclerosant concentration was adapted according to the diameter of the vessels and only one sclerosing substance was chosen. Medium area treated was around 5 in^2/ on each leg. Sites of blow up were injected first.

RESULTS: The total of 200 leg treatments in 100 consecutive patients resulted in vessels clearance of 85% on the legs treated by the venular sclerotherapy method compared with 65% of the comparative method of the sclerosant when injected directly over the teleangiectasias. The traditional method of teleangiectasia injection has a high incidence of complications like matting (16 to 25%), superficial ulcers (8%), hiperpigmentation (15%) and superficial phlebitis (5%) while the venular method had matting (5%) superficialulcers (2%), hiperpigmentation (12%) and 10% of superficial phlebitis (10%).

CONCLUSIONS: Sclerotherapy injection over the venular flow of the capillaries showed to be more efficient, closing more vessels than those injected directlly over the dilated capillaries of the superficial area of the skin because of the larger diameter of the venules, its venular histophysiopathologic reaction to sclerosant, reason why, veins have a better inflamatory reaction to the sclerosant solution. The reduction of teleangiectatic matting complications to 5% in this study of these iatrogenic problem, showed us to be a method that requires much more detailed papers to be studied.

P22 Feasibility of Endovenous Laser Treatment of Recurrent Small Saphenous Vein Incompetence

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BACKGROUND: In the past few years endovenous laser treatment (EVLT) has become a popular treatment modality in treating varicose veins due to saphenofemoral junction incompetence and great saphenous vein reflux. Some studies and patients series have shown that endovenous laser treatment of the small saphenous vein (SSV) could be a good alternative to conventional surgery, with excellent short-term results and very few complications. However, safety and efficacy are unknown if EVLT is used to treat recurrent sapheno-popliteal junction (SPJ) and SSV incompetence.

METHODS: All patients in this study had duplex proven recurrent SPJ incompetence after prior conventional surgery of the SPJ between 1996 and 2008. Conventional surgery consisted of ligation of the SPJ without stripping the SSV. EVLT was performed under tumescent anesthesia using a 810-nm diode laser. All patients were advised to wear elastic stockings for 2 weeks after the procedure. Medical charts of all patients were reviewed retrospectively. The efficacy of the procedure was determined with duplex ultrasound, 6 months after the procedure. There were no duplex-based exclusion criteria for patients to perform EVLT.

RESULTS: Twenty-eight patients with clinical symptoms due to recurrent SPJ and SSV reflux, documented by duplex ultrasound were treated with EVLT. There were 11 men and 17 women, with a mean age of 52.4 years (range 29–77). EVLT was feasible in all 28 patients. From 21 patients a post procedural duplex ultrasound was obtained. In 15 patients (71%) the SSV was occluded. In 6 patients (29%) some degree of recanalisation was found. No major complications like deep venous thrombosis, pulmonary embolism or persistent paresthesia were observed.

CONCLUSIONS: EVLT seems to be a safe, effective and minimally invasive alternative in patients with varicose veins due to recurrent SPJ and SSV incompetence. However prospective randomized controlled trials with long-term follow-up are needed.

P23 980 nm and 1470 nm Lasers and Conventional Surgery for the Treatment of Primary Saphenous Varicose Veins of CEAP's C2: A Comparison of Clinical Outcomes Using CIVIQ2

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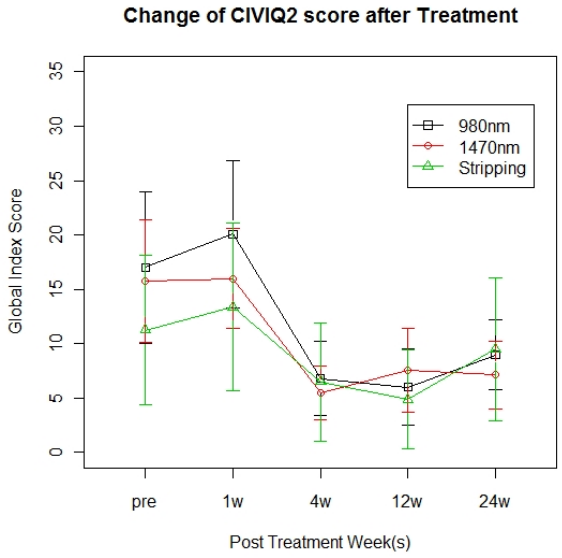
BACKGROUND: Endovenous laser ablations (EVAs) of primary varicose veins are accepted alternatives to conventional surgery. Moreover, new wavelength of 1470 nm diode laser has the potential of reducing major side effects after EVA. However comparative data of clinical outcomes are hardly existent. The aim of this study is to compare the clinical outcomes using CVIQ2 between 980nm and 1470nm diode lasers and conventional surgery.

METHODS: Total of 41 patients of CEAP's C2 participated in this study. 980 nm EVA was performed in 16 (GSV 14, SSV 2, male 6, female 10, age 56.7, diameter 4.7 mm, VFI 3.6ml/sec) and 1470 nm EVA was performed in 15 (GSV 11, SSV 4, male 1, female 14, age 51.0, diameter 5.4, VFI 5.2) under tumescent anesthesia. Set Power was 12W, average linear endovenous energy density was 71.2 ± 9.6J/cm in 980 nm, 58.5 ± 8.5J/cm in 1470 nm. Crossectomy and stripping was performed in 10 (GSV 7, SSV 3, male 3, female 7, age 56.1, diameter 6.0, VFI 5.2) under total intravenous anesthesia. The results were evaluated clinically and with Duplex US and the chronic venous insufficiency questionnaire (CIVIQ2, Japanese version) score before treatment, at one, four, 12 and 24 weeks after treatment.



RESULTS: There was no significant difference between the baseline CIVIQ2 scores of each group (980nm; 17.0 ± 13.1, 1470 nm; 15.7 ± 10.2, surgery; 11.3 ± 9.6, p = 0.4399). At 4 weeks, significant improvement of the score in 980 nm (9.0 ± 6.0, p = 0.0276) and 1470 nm (7.1 ± 5.6, p = 0.002147). However, the improvment of the score at 4 weeks in the surgery group was not significant (9.5 ± 9.2, p = 0.5304). There were no signifficant difference between the scores of 980 nm, 1470 nm and surgery during the follow-up period; p = 0.2885 at one week, p = 0.642 at 4 weeks, p = 0.8277 at 12 weeks and p = 0.6141 at 24 weeks (Fig. 1).

CONCLUSION: These findings suggest that both 980 and 1470 nm may have greater promise compaired with conventional surgery in the early phase after treatment. And based on the results of an accepted outcome measurement tools, the benefits of 1470 nm compared with 980 nm was not revealed.

P24 Assessment of the Quality of Life in Women With Venous Disease

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BACKGROUND: Currently, venous disease constitutes a real medical problem as well as a real socio-professional disability because of its physical symptoms. The quality of life of the patients is affected by this problem. The objective is to assess, in real-life conditions, the impact of a Vitamin C, Ruscus and hesperidin methyl-chalcone based treatment, on the quality of life of patients with venous disease.

METHODS: Pragmatic assessment in real-life conditions over a 7-day period with the pharmacist handing out the questionnaire when the treatment is delivered.

The SQOR-V is a validated, available in several languages, patient reported outcome specially dedicated to Chronic Venous Disorders (CVD). It allows a relevant and sensitive assessment of clinical features and quality of life of patients at all stages of CVD. The SQOR-V scoring comprises 45 items. The total score vary from 20 to 100. The higher the score, the more the quality of life affected by venous insufficiency is impaired.

RESULTS: 108 women were included, average age 49.98 (±15.89), average weight 67.07 kg (± 16.67) with an average BMI of 24.43 (±4.47), 26% with a BMI higher than 25 and 76% are non smoking and 42% exercise regularly. 67.5% have a professional activity, of which 91% are required to stand for more than 6 hrs, and 48% say they must stand without any rest. For 41% of them, the treatment was prescribed by a doctor, for 35% the pharmacist suggested the treatment, and 13% requested the treatment (11% did not specify).

One patient in 3 believes that her discomfort (36%), complaints (36%) and pain (33%) had improved as soon as the 3rd day. On the 7th day, 3 in 4 patients believed that their discomfort (72%), complaints (74%) and their pain (68%) had improved. 94% of the patients declared being satisfied and 90% would recommend this treatment. This data is confirmed through the quality of life assessment. In fact, the quality of life assessment questionnaire SQOR-V shows a score of 42.08 at the time of inclusion, which became 38.56 at the end of the 7-day treatment period. The quality of life improvement is statistically significant ($p < 0.0001$).

CONCLUSIONS: The treatment with vitamin C, Ruscus and hesperidin methyl-chalcone shows its effectiveness in 7 days through a statistically significant improvement of quality of life. This data is confirmed by the patients' satisfaction expressed through the renewal of the treatment and recommending it to people they know.

P25 Distribution of Lipid Molecules in Autogenous Access Grafts for Hemodialysis Using Imaging Mass Spectrometry

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BACKGROUND: When superficial veins are used as autogenous access for hemodialysis, arteriovenous (AV) fistula may affect venous biological structures due to the arterial pulsatile blood flow. However, the changes in molecular structure in the vein wall are yet to be understood. To gain insights of biological responses in venous wall after AV fistula, we utilized a novel technique of imaging mass spectrometry in analyzing the distribution of lipid molecules in vein tissue.

METHODS: Autogenous AV grafts in the forarm were obtained from five hemodialysis patients who underwent salvage operation of AV fistula with anastomotic stenosis. As control vein (CV) samples, segmental cephalic vein tissue was harvested from another five patients when they underwent AV fistula creation for initiating hemodialysis. Common femoral artery tissues were harvested from five patients with peripheral artery occlusive disease (PAD artery) who underwent femoro-popliteal bypass surgery as atherosclerotic samples. The stored tissue was analyzed later with matrix-assisted laser desorption/ionization imaging mass spectrometry (MALDI-IMS), which can distinguish different unspecific molecular species and enable the distribution of those molecules on the tissue surface.

RESULTS: We obtained mass spectra directly from these tissues. The characteristic distributions of molecules were not observed in CV. The ratios of ion intensity in the intima, media to that in the adventitia of cholesterol ester (CE) and sphingomyelin (SM) (d18:1/C16:0) at AV grafts were 2.8, 3.0, and 2.6, 2.6, respectively. Similar distribution patterns of the molecules were also observed in PAD artery. (Figure 1) In AV grafts, the ratio of intima/adventitia, media/adventitia for lysophosphatidylcholine (LPC) (16:0) and phosphatidylcholine (PC) (1-acyl 36:4), of which a major composition of fatty acids is arachidonic acid (20:4), were 1.5, 2.6 (LPC) and 1.5, 2.9 (PC), respectively, Accumulation of these molecules in AV grafts were more marked in media than in intima. Quantitative analysis of PC (1-acyl 36:4) identified the accumulation of the molecule in both AV grafts and PAD artery with the ion intensity 3.5, 3.9-fold higher than that in CV, respectively (Figure 2).

Fig.1

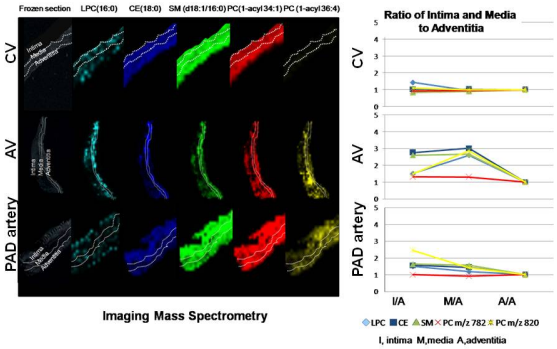
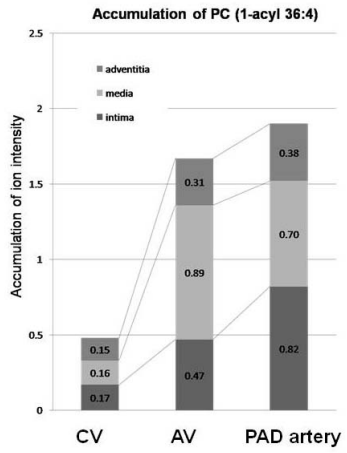


Fig.2



CONCLUSIONS: MALDI-IMS identified the unique distribution of PC in autogenous AV grafts which resembled atherosclerotic artery. The accumulation of PC (1-acyl 36:4) may suggest the arachidonic acid-related chronic inflammation in the tissue.

P26 Efficacy and Safety of Great Saphenous Vein Trunk Sclerotherapy Under Balloon Occlusion At Sapheno-Femoral Junction

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BACKGROUND: Foam sclerotherapy of the great saphenous vein (GSV) is promising method under ultrasound-guidance to deliver foamed sclerosing agents. However, venous blood reflux or flowing out of formed sclerosants through sapheno-femoral junction (SFJ) could not be blocked. We developed a noble technique for catheter-directed foam sclerotherapy of GSV trunk under balloon occlusion at SFJ and early results of this treatment were evaluated.

METHODS: Between April 08 and March 2009, a consecutive series of 64 patients of varicose vein with GSV truncal incompetence in 77 limbs were treated. Up to 5.0 mL of 2.4% polidocanol foam including contrastmedia was injected through an introducer sheath (5 Fr. 30 cm long), which was inserted percutaneously over a guidewire in the GSV, following balloon occlusion at SFJ using 4 Fr. Fogarty catheter under venography. All treated patients were examined by color duplex ultrasonography at 1~ 3 and 24 months after treatment.

RESULTS: Primary occulusion rate of GSV was achieved in 70 of 77 limbs (91%). Ultrasonography (US) revealed that the diameter of GSV near SFJ was decreased in 72% of all treated cases and the echogenisity of occluded GSV was increased to be isoechogenic. On the other hand, the inner lumen of non-occluded GSV of 7 in 77 limbs was hypertrophic and the reflux flow was extremely reduced in all cases. Follow-up US of 6 cases at one-year post-sclerotherapy detected that the contrast of GSV wall had been obscure in 7 of 8 limbs. There was no instance of deep vein thrombosis, superficial thrombophlebitis or systemic complications in this series.

CONCLUSIONS: The catheter-directed foam sclerotherapy of GSV trunk under balloon occlusion at SFJ is a safe treatment and has resulted in excellent early results.

P27 Reflux in Foot-Veins Is Associated with Venous Toe and Forefoot Ulceration

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BACKGROUND: The clinical significance of reflux in specific foot-veins is not known, but previous authors have demonstrated that incompetence of the foot-pump mechanism in the forefoot can be found in ulceration on the dorsum of the toes and/or forefoot. This condition may not be uncommon, as it can be acquired by intravenous drug abuse, but it has received little attention in the surgical literature. The purpose of the current study was to investigate the prevalence of foot vein reflux and of toe-ulceration in a group of patients with chronic venous insufficiency (CVI) and lower extremity ulceration and to examine their relation.

MATERIALS & METHODS: A cross-sectional study was performed on outpatients with active or recently healed leg ulcers due to CVI, that is, CEAP C5 and C6. All patients first underwent a screening exam with continuous wave Doppler of all foot-veins in the areas listed below: If reflux was suspected, a detailed duplex-exam was performed with a 12 MHz probe using 0.5 second reflux-duration as the upper limit upon manual compression-release of the forefoot. The foot segments of the greater saphenous (GSV), short saphenous (SSV), anterior arch veins extending over the foot-dorsum (AAV), superficial venous arch (SVA) and plantar veins (PV) were included in the study. Patients with toe-ulceration had normal arterial toe-pressures excluding arterial obstruction.

RESULTS: A total of 21 limbs were entered into the study. Reflux in one or more foot-veins was found in 6 (29%) of our patients. Four patients, (19%) had severe clinical involvement (lesion/ulceration) of the toes or forefoot. The number of incompetent foot-segments ranged from 0 to 5. Contiguous incompetent segments allowing direct transmission of venous hypertension from the ankle to the forefoot were seen in toe-ulcers.

Chi-square analysis was significant at the $p < .05$ level.

Table I: 2 x 2 Table Incompetent Foot-Veins Versus Toe-Ulceration

	Foot-Reflux	No Foot-Reflux	
Toe-ulcer present	4	0	4
Ankle ulcer only	2	15	17
Total	6	15	21

CONCLUSIONS: Reflux can occur in isolated foot veins of CEAP C5, C6 legs without toe-lesions, but presence of multiple areas of foot-segment reflux is often associated with forefoot- and toe-ulceration. Although the therapeutic implications are not fully known, it may be important to examine foot-veins to distinguish foot-vein reflux from toe/forefoot-lesions due to other causes.

P28 Prognostic Impact of Calf Muscle Near-Infrared Spectroscopy in Patients with a First Episode of Deep Vein Thrombosis

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BACKGROUND: To investigate changes in calf muscle deoxygenated hemoglobin (HHb) levels after acute deep vein thrombosis (DVT), and to determine the indicative parameters reflecting the progression of post-thrombotic syndrome (PTS).

METHODS: Seventy-six consecutive patients with a first episode of unilateral DVT were prospectively enrolled. Clinical manifestations were categorized according to the CEAP classification, and the patients were divided into no PTS ($C_{0-3}E_s,A_{s,d,p},P_{r,o}$) and PTS ($C_{4-6}E_s,A_{s,d,p},P_{r,o}$) groups. Near-infrared spectroscopy (NIRS) was used to measure calf muscle HHb levels at 6 months after diagnosis of DVT. Calf venous blood filling index (HHbFI) was calculated on standing, then the venous ejection index (HHbEI) and the venous retention index (HHbRI) were obtained after exercise. All patients were followed up for more than 24 months after the diagnosis of DVT.

RESULTS: Of 76 patients evaluated, 20 (26.3%) had PTS. The NIRS-derived HHbFI and HHbRI were significantly increased in patients who developed PTS in comparison with those who did not ($P = 0.04$, 0.0001, respectively). HHbRI was significantly increased in patients with ilio-femoral DVT in comparison with patients with calf DVT ($P = 0.041$). An optimal cut-off point of 2.9 for HHbRI showed the strongest ability to predict the development of PTS, with a sensitivity of 100% and a specificity of 82.1%.

CONCLUSIONS: HHbRI as measured by NIRS is significantly increased in patients with ilio-femoral DVT as compared to those with calf DVT. Furthermore, HHbRI >2.9 provides strong ability to predict the development of PTS at 6 months.

P29 Combined Use of Pretest Clinical Probability Score and Latex Agglutination D-Dimer Testing in Excluding Acute Deep Vein Thrombosis

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BACKGROUND: Currently, the latex agglutination D-dimer assay is widely used for excluding deep vein thrombosis (DVT), but is considered less sensitive than the ELISA-based D-dimer test. The purpose of the present study was to determine if a combination of different cut-off points rather than a single cut-off point of 1.0 μg/mL and the pretest clinical probability (PTP) score would be able to reduce the use of venous duplex scanning in patients with suspected DVT using the latex agglutination D-dimer assay.

METHODS: Nine hundred eighty-nine consecutive patients with suspected DVT were evaluated using PTP score and D-dimer testing before venous duplex scanning. After calculating the clinical probability scores, patients were divided into low-risk (≤0 points), moderate-risk (1–2 points), and high-risk (≥3 points) pretest clinical probability groups. Receiver operating characteristic (ROC) curve analysis was used to determine the appropriate D-dimer cut-off point for each PTP with a negative predictive value of >98% for a positive duplex scan.

RESULTS: Eight hundred eighty-six patients were enrolled. The study group included 609 (68.7%) inpatients and 277 (31.3%) outpatients. The prevalence of DVT in this series was 28.9%. Five hundred and eight patients (57.3%) were classified as low-risk, 237 (26.8%) as moderate-risk, and 141 (14.9%) as high-risk PTP. DVT was identified in 29 patients (5.7%) with low-risk, 118 (49.8%) with moderate-risk, and 109 (77.3%) with high-risk PTP. Using ROC curve analysis, D-dimer cut-off points of 2.6, 1.1 and 1.1 μg/mL were selected for the low-, moderate- and high-risk PTP groups, respectively. In the low-risk PTP group, specificity increased from 48.9% to 78.2% ($P < .0001$) with use of the different D-dimer cut-off value. In the moderate- and high-risk PTP groups, however, the different D-dimer levels did not achieve substantial improvement. Despite this, the overall use of venous duplex scanning could have been reduced by 43.0% (381/886) if the different D-dimer cut-off points had been used.

CONCLUSIONS: Combination of a specific D-dimer level with the clinical probability score is most effective in low-risk PTP patients for excluding DVT. In moderate- and high-risk PTP patients, however, the recommended cut-off points of 1.0 μg/mL may be preferable. These results show that different D-dimer levels for patients differing in risk is feasible for excluding DVT using the latex agglutination D-dimer assay.

P30 Comparison of Radiofrequency Ablation to Endovenous Laser Ablation of the Great Saphenous Vein

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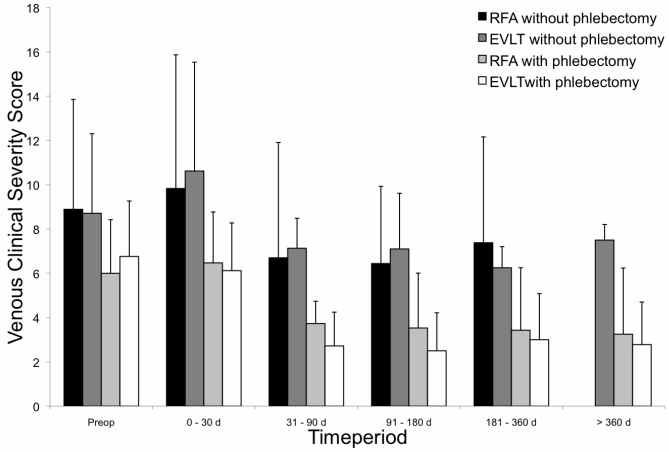
BACKGROUND: The purpose of this investigation is to compare the efficacy and complications of radiofrequency ablation (RFA) and endovenous laser ablation (EVA) of the great saphenous vein (GSV) at a major medical center. We also sought to evaluate the impact of concomitant phlebectomy on clinical outcomes.

METHODS: In a nonrandomized retrospective data review 125 patients underwent GSV ablation from January to December 2008. 75 of these patients underwent RFA with the FASTClosure catheter and 50 underwent EVA with the Diomed 810 catheter. Concomitant phlebectomy was performed with either powered (Trivex) or stab technique (35/75 for RFA and 28/50 for EVA). Data was prospectively collected and retrospectively reviewed, including VCSS scores at baseline and at followup as well as complications documented both clinically and by duplex imaging. Duration of follow-up ranged from 1 to 15 months (mean 6.2 months).



RESULTS: The occlusion rate by survival analysis at 15 months was 98.8% (RFA 100%, EVA 96%). VCSS analysis revealed that patients had an improved result with the addition of phlebectomy (see Table, Figure). RFA was associated with a higher DVT rate (5.3%, two cases alone and two with phlebectomy, versus 0% for EVA), whereas EVA was associated with a higher rate of saphenofemoral thrombus extension (4% for EVA, in all cases without phlebectomy, versus 0% for RFA). Superficial thrombophlebitis was noted in three cases, all associated with phlebectomy. There was no statistical difference in the rate of change of VCSS or the rate of thromboembolic complications based on the phlebectomy type, powered versus stab.

Venous Clinical Severity Scores

	Ablation without Phlebectomy	Ablation with Phlebectomy
Preop	8.83 ± 4.53, n = 52	6.35 ± 2.47, n = 55
0–30 days	10.12 ± 5.62, n = 57	6.32 ± 2.23, n = 56
31–90 days	6.89 ± 3.89, n = 18	3.10 ± 1.42, n = 29
91–180 days	6.68 ± 3.14, n = 28	3.15 ± 2.25, n = 27
181–360 days	7.00 ± 3.89, n = 12	3.21 ± 2.39, n = 14
>360 days	5.00 ± 4.36, n = 3	2.92 ± 2.18, n = 13

CONCLUSIONS: Phlebectomy added to saphenous vein ablation improves VCSS scores; RFA was found to be associated with a higher rate of true DVT, whereas EVA was associated with a higher rate of saphenofemoral thrombus extension; and powered phlebectomy was equivalent to stab phlebectomy in terms of clinical outcomes and thromboembolic complications. These observations combined with our previous EVA data sets the stage for a RCT comparing RFA to EVA.

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Alexandria
Cordts, Paul R

Charlottesville
Cherry, Kenneth J
Owens, Lewis

McLean
Sidawy, Anton N

Norfolk
Bonawitz, Cara A

Portsmouth
Arbid, Elias J

Reston
Lee, Byung-Boong

Roanoke
Drougas, James A

Williamsburg
Delaurentis, Dominic A

WASHINGTON

Bellevue
Gibson, Kathleen

Seattle
Meissner, Mark H
Sobel, Michael
Zierler, Brenda K
Zierler, R. Eugene

Vancouver
Nicholls, Stephen

WEST VIRGINIA

Charleston
AbuRahma, Ali F
Boland, James P

WISCONSIN

Appleton
Vogt, Philip A

Green Bay
Hutto, John D

Madison
Carr, Sandra C
Turnipseed, William D

Manitowoc
Gueldner, Terry L

Milwaukee
Brown, Kellie
Seabrook, Gary R
Towne, Jonathan B

International Members

ARGENTINA

Buenos Aires
Cigorraga, Jorge Raul
Enrici, Ermenegildo A
Papendieck, C M
Pietravallo, Antonio F R
Segal Halperin, Boris M
Simkin, Carlos G
Simkin, Roberto

Mendoza
Farmache, Alejandro H

Roasrio
Schapira, Armando E

AUSTRALIA

Wagga Wagga
Richardson, Graeme D

AUSTRIA

Vienna
Partsch, Hugo

BELGIUM

Ghent
Vandendriessche-Hobbs, Marianne

BRAZIL

Porto Alegre- RS
Komlos, Pedro P

Sao Paulo
Kikuchi, Rodrigo
Osse, Francisco

CANADA

Calgary
Hill, Douglas

Hamilton
Hirsh, Jack

Quebec
Dion, Yves M

Vancouver
Salvian, Anthony J
Sladen, Joseph G

CHILE

Viña del Mar
Orrego, Alvaro E

CYPRUS

Ayios Dhometios
Nicolaides, Andrew N

DENMARK

Naestved
Rasmussen, Lars H

FRANCE

Chassieu
Perrin, Michel

Grenoble
Carpentier, Patrick H

Marseille
Hartung, Olivier

Montpelier
Milleret, Rene

Neuilly-sur-Seine
Cornu-Thenard, Andre M
Uhl, Jean-Francois

Nice
Guex, Jean-Jerome
Pittaluga, Paul

Paris
Cazaubon, Michele
Natali, Jean P
Schadeck, Michel P

GERMANY

Bonn
Rabe, Eberhard

Hirschberg
Proebstle, Thomas

Nuremberg
Noppeney, Thomas

Wandlitz
Schultz-Ehrenburg, Ulrich

GREECE

Athens
Balas, Panayiotis E
Liasis, Nikolaos E

GUATEMALA

Guatemala City
Corrales, Noel E

INDIA

Hyderabad
Gupta, Prem C

Mumbai
Somaya, Anand C

ISRAEL

Zerifin
Bass, Arie

ITALY

Ferrara
Zamboni, Paolo

Rome
Allegra, Claudio
Caggiati, Alberto
di Marzo, Luca

JAPAN

Fukushima
Hoshino, Shunichi
Ogawa, Tomohiro

Izumisano
Hirano, Tetsuya

Moriya City
Iwai, Takehisa

Okinawa
Sakuda, Hitoshi

Tokyo
Ishimaru, Shin
Yamaki, Takashi

KOREA

Daegu
Suh, Bo Yang

Seoul
Kim, Young-Wook

LEBANON

Beirut
Shamma, Asad R

LUXEMBOURG

Goetzingen
Lamesch, Alfred J

MALAYSIA

Kuala Lumpor
Liew, Ngoh C

MEXICO

Huixquilucan
Aguila Marquez, Roberto

Mexico City
Paramo-Diaz, Marcelo

NETHERLANDS

Rotterdam
Klem, Taco M
Wittens, Cees H.A.

Utrecht
Disselhoff, Ben

POLAND

Szczecin
Kompf, Boguslaw

PUERTO RICO

San Juan
Rodriguez, Agustin A

RUSSIA

St. Petersburg
Shaidakov, Evgeny V

Yekaterinburg
Belentsov, Sergey M

SERBIA

Nis
Milic, Dragan

SOUTH KOREA

Seoul
Joh, Jin-Hyan

SPAIN

Madrid
Monedero, Javier Leal
Zubicoa, Santiago Ezpeleta

SWEDEN

Helsingborg
Eklof, Bo G

Linkoping
Thulesius, Olav

Orebro
Arfvidsson, Berndt

Uppsala
Bergqvist, David

SWITZERLAND

Geneva
Christenson, Jan T

Lucerne
Lauber, Andre F

Strafa
Bollinger, Alfred

Zurich
Schepers, Helmut

TRINIDAD, WEST INDIES

Trincity
Maharaj, Dale

TURKEY

Istanbul
Kurtoglu, Mehmet H

UK

Alderney
Browse, Norman L

Edinburgh
Ruckley, C. Vaughan

London
Burnand, Kevin G
Davies, Alun Huw
Hobbs, John T
Scurr, John H
Sharp, Beverley

Solihull
Bradbury, Andrew W

Wexham
Coleridge Smith, Philip D

AMERICAN VENOUS FORUM

BY LAWS

Article I – Name

The name of this organization shall be THE AMERICAN VENOUS FORUM.

Article II – Objectives

The objectives of this organization shall be (1) to promote venous and lymphatic health through innovative research, education, and technology; (2) to contribute to the active continuing education of its membership; (3) to hold annual meetings; and (4) to encourage the development and dissemination of knowledge regarding venous disease.

MISSION STATEMENT

The mission statement of this organization shall be to promote venous and lymphatic health through innovative research, education and technology.

Notwithstanding the foregoing, (a) no part of the organization's net earnings or assets shall inure to the benefit of any member, officer, or other person, except that the organization shall be authorized and empowered to pay reasonable compensation for services rendered and to make other payments and distributions in furtherance of the purposes set forth above, and (b) the organization shall not carry on any activity not permitted to an organization exempt from Federal income tax under Section 501 (c) (6) of the Internal Revenue Code of 1954, as amended (the "Code") or the corresponding provision of any future United States revenue statute.

Article III – Membership

Membership in the Venous Forum may include any physicians certified by their respective specialty Certifying Boards in the applicant's Country of practice who have demonstrated an interest in and contribution to the management of venous problems and who are in good standing in their State or Provincial Medical Societies. From time to time, the Membership Committee may recommend membership to scientists who are not M.D.'s and/or do not possess a doctoral degree but have demonstrated a major commitment to issues of venous disease.

1. Active Members: as identified above. Active members shall pay dues and have full voting privileges. Attendance at the Annual Scientific Program shall be expected of all Active members.

2. Senior Members included will be active members who have reached the age of 65 years; or members for whom, for reasons of health or other just cause, the Executive Committee recommends this category. They shall not be bound by meeting attendance and dues may be waived upon written request by Senior Member to waive dues. The Executive Committee may approve or disapprove the request at an executive meeting.

3. Honorary Members: individuals who have made outstanding contributions in the field of venous science. They shall not pay dues nor shall they have voting privileges.

4. Associate Members: Individuals who have an interest in the management of venous disorders, but do not necessarily hold a doctoral degree, such as nurses, registered vascular technologists, etc. Associate members will pay membership dues determined by the Executive Committee. Associate members are not eligible to vote or hold elective office.

5. Candidate Members: Physicians who are currently serving in a capacity of a resident or fellow in post-doctoral training programs and have demonstrated interest in and have made a contribution to the management of venous disease. Candidate members are not eligible to vote or hold elective office and are required to pay membership dues as set by the Executive Committee. Membership in this category shall not exceed 3 years. At the conclusion of post-doctoral training, Candidates may opt to become Active Members, by notifying the Forum in writing. In this instance, the application process will be waived, and the name shall automatically be placed on the Ballot.

Article IV – Election of Members

1. The process of election of Active members of the Society shall be as follows:

   a. Applications must be accompanied by a letter of interest, documenting the applicants experience in venous and lymphatic disease.

   b. Application forms must be accompanied by the curricula vitae of the candidates and shall be in the hands of the Secretary before the executive session at which it is desired that the candidate be considered for election.

   c. The Secretary shall send to the Chair of the Membership Committee these applications with all pertinent data before the annual meeting. The Membership Committee shall review the professional qualifications of the candidates.

   d. The Chair of the Membership Committee shall meet with the Executive Committee for the purpose of presenting the recommendations of the Membership Committee.

   e. The names of the candidates recommended by the Executive Committee for election shall be submitted by the Secretary to the membership in his or her annual report.

   f. Election to membership shall be by secret ballot, by a three fourths affirmative vote of those members present and voting at the annual business meeting

   g. A candidate who fails to be elected at one meeting, may be presented to the membership at the next two (2) annual meeting of the Forum. The name of a candidate who fails of election a third time shall be dropped from the list of applications for membership. Such candidate's application may be resubmitted after an interval of two (2) years.

   h. New Member Attendance: Candidates, following their election to membership at the Annual Business Meeting of the organization, will be required to attend the next Annual Meeting of the Forum to be formally introduced to the membership.

2. The process of election for Associate and Candidate Members shall be as follows:

   a. Application forms presenting the curricula vitae of the candidates and signed by them shall be in the hands of the Secretary before the executive session at which it is desired that the candidate be considered for election.

   b. The Secretary shall send to the Chair of the Membership Committee these applications with all pertinent data before the annual meeting. The Membership Committee shall review the professional qualifications of the candidates.

   c. The Chair of the Membership Committee shall meet with the Executive Committee for the purpose of presenting the recommendations of the Membership Committee.

   d. The names of the candidates recommended by the Executive Committee for election shall be submitted by the Secretary to the membership in his or her annual report.

   e. Election to membership shall be by secret ballot, by a three fourths affirmative vote of those members present and voting at the annual business meeting

   f. A candidate who fails to be elected at one meeting may be presented to the membership at the next two (2) annual meeting of the Forum. The name of a candidate who fails of election a third time shall be dropped from the list of applications for membership. Such candidate's application may be resubmitted after an interval of two (2) years.

   g. New Member Attendance: Candidates, following their election to membership at the Annual Business Meeting of the organization, will be required to attend the next Annual Meeting of the Forum to be formally introduced to the membership.

3. The process of election of Honorary members of the Forum shall be as follows:

   a. Any Active or Senior member may nominate an individual for Honorary membership. The name and a brief description of the accomplishments of the nominee must be submitted to the Secretary before the Executive Session at which it is desired the nominee be considered for honorary membership. The Secretary shall distribute this information to the Honorary Membership Committee consisting of three (3) immediate past Presidents of the Executive Committee before the annual meeting.

   b. The Honorary Membership Committee shall make its recommendations to the Executive Committee.

   c. Following its deliberation, the Executive Committee may recommend that the candidate's name be submitted by the Secretary to the membership in the annual report at the Annual Business Meeting of the Forum.

   d. Election to Honorary Membership shall be by secret ballot by three fourths affirmative vote of the membership present and voting at the Annual Business Meeting.

Article V – Executive Committee

1. The Executive Committee of the Forum shall direct the activities of the Forum.

2. The Executive Committee shall be composed of the President, the President Elect, the Secretary, the Treasurer, the Recorder, at least three Councilors the Chairs of the Education and Research Councils, the immediate three Past Presidents, and the Archivist.

3. The Executive Committee shall be the governing body of the Forum and shall have full power to manage and act on all affairs on the Forum except as follows:

   a. It may not, without the approval of the Forum membership at an annual executive session, alter the initiation fees or levy any assessment against the membership, except that it may, set the annual dues rates and, in individual cases, waive annual dues or assessments.

   b. It may not amend the By Laws.

   c. It may neither elect new members nor alter the status of existing members, other than to apply the provisions of Article XI.

4. The President of the Forum shall serve as Chairman of the Executive Committee and the Secretary of the Forum as its Secretary.

5. Meeting of the Executive Committee shall be held at the call of the President of the Forum and each member of the Executive Committee must be notified in writing of the time and place of each such meeting no less than ten (10) days prior to the meeting.

6. The annual meeting of the Executive Committee shall precede the annual business meeting of the Forum membership.

7. A majority of the voting members of the Executive Committee shall constitute a quorum for the transaction of business.

8. The act of a majority of members of the Executive Committee present at a duly called meeting at which a quorum is present shall be the act of the Executive Committee unless the act of a greater number is required by applicable statute or these By Laws.

9. Any action which is required by law of the Articles of Incorporation or these By laws to be taken at a meeting of the Executive Committee, or any other action which may be taken without a meeting if a consent in writing, setting forth the action taken shall be signed by all of the members of the Executive Committee entitled to vote with respect to the subject matter thereof. Any such consent signed by all of the members of the Executive Committee shall have the same force and effect as a unanimous vote at a duly called and constituted meeting of the Executive Committee.

10. American Venous Forum Foundation: At its Annual Meeting, the Executive Committee shall elect up to eight (8) individuals to serve as members of the Board of Directors of the American Venous Forum Foundation. These eight individuals shall include the Secretary, Treasurer, and Immediate Past President of the American Venous Forum. Each elected Director, other than the Secretary and Treasurer, shall serve a staggered term of up to three (3) years and shall be eligible for an additional reappointment of one (1) three-year term for a maximum of six (6) years of service to the Board.

Article VI – Councilors and Officers

1. The officers of the Forum shall be a President, a President elect, Secretary, Treasurer and Recorder, all to be elected as provided in the By Laws. Said officers shall serve ex officio as voting members of the Executive Committee.

2. All officers of the Forum, except the Secretary, the Recorder, the Archivist, and the Treasurer, shall be elected for terms of one (1) year each and until their successors are elected and qualified. The President may not serve more than one (1) consecutive term. The Secretary, Recorder and Treasurer will serve three (3) years each and until their successors are elected and qualified. Councilors shall be elected serving overlapping terms of three (3) years each.

3. A Councilor, Archivist, and the officers of the Forum shall be nominated by the Nominating Committee, which shall present the slate to the Executive Committee at its annual meeting and to the members at the annual business meeting. Additional nominations may be made from the floor at the annual business meeting each year. The election shall take place at the executive session.

   Election of officers shall be by a majority of the votes cast. The three candidates for Councilor who receive the most votes shall be elected, provided that each member may vote for three candidates for Councilor and may not cumulate his or her votes.

4. The President shall preside at the meetings of the Forum membership Executive Committee, and Officers, and preserve order, regulate debates, announce results of elections, appoint committees not otherwise provided for in the Bylaws, sign certificates of membership, and perform all other duties normally appertaining to his office.

5. The President elect in the absence or incapacity of the President shall perform the duties of the President's office.

6. In the absence of both the President and the President elect, the position shall be taken by a chairman pro tem, nominated and elected by such members of the Executive Committee as are present.

7. The Secretary shall keep the minutes of the meetings of the Forum, the Executive Committee, and the Officers; attest all official acts requiring certification; notify councilors, officers and members of their election and take charge of all papers not otherwise provided for. The Secretary will be the Chair of the Administrative Council and make appointments as delineated in Article VII. At least ten (10) days but not more than thirty (30) days prior to each annual or special meeting, the Secretary shall issue to all members of the Society a program of the forthcoming meeting. The Secretary shall compile a written report to be read at the annual business meeting of the Forum in which shall be included the list of candidates proposed for membership, as approved by the Executive Committee.

8. The Treasurer shall receive all monies and funds belonging to the Forum to pay all bills; render bills for dues and assessments as soon as possible after the annual meeting; and report to the Executive Committee at each annual meeting the names of all members in arrears as to dues.

9. The Recorder shall receive all papers and reports of discussions on paper presented before the Forum or read by title.

10. The Archivist shall serve for three years and until a successor is elected and qualified. The Archivist shall be nominated by the Nominating Committee.

Article VII – Committees and Councils

1. The activities of the American Venous Forum will be conducted by designated committees under the oversight of four (4) councils, designated the Administrative, Research, Education, and Development Councils.

2. Each council will have a council chair or co-chair determined as follows.

    a. The President of the American Venous Forum will appoint the chair of the Research and Education councils at the time of the annual business meeting. The chair of the Research Council will serve a three (3) year term, and the chair of the Education council will serve a two (2) year term.

    b. The secretary of the Forum will serve as chair of the Administrative Council.

    c. The president and immediate past president of the American Venous Forum Foundation will serve as co-chairs of the Development Council.

3. The Administrative Council will consist of the chairmen of the Bylaws, Membership, Nominating, Program, Issues, and Honorary Membership committees (the Administrative committees), with the secretary of the Forum serving as chairman. The secretary of the forum will serve as an ex-officio member of all committees of the Administrative Council.

    a. The By-Laws Committee shall consist of three members to serve overlapping terms of three (3) years each with the secretary of the Forum serving as Chair. A new member shall be appointed annually by the Administrative Council Chair (secretary of the Forum). They will review the By-Laws from time to time as directed by the Executive Committee.

    b. The Membership Committee shall consist of three (3) members who shall be appointed, one in each year, by the Administrative Council Chair (secretary of the Forum) to serve overlapping terms of three (3) years each, plus the Secretary as an ex officio member. The senior member in terms of service on this committee shall be the chair. The functions of the Committee shall be to pass upon the professional and ethical qualifications of the applicants and to advise the Executive Committee of the recommendations of the Committee.

    c. The Nominating Committee shall consist of the three (3) most recent available Past Presidents and shall be appointed by the President one (1) month before the annual meeting. Its function shall be to comprise a slate of officers, and a member or members of the Membership Committee, to be presented at the annual meeting to the members at the Executive Session. The Senior Member in terms of service on this Committee shall be the Chairman.

d. The Program Committee shall consist of four (4) members who shall be appointed, one in each year, by the Administrative Council Chair (secretary of the Forum) to serve overlapping terms of four (4) years each. The senior member in terms of service on this committee shall be the chairman. The Secretary and Recorder shall be ex officio members of the Program Committee. The function of the Program Committee shall be to solicit papers and other presentations from members and other individuals and to make up the program for the annual meeting.

e. The Issues Committee shall consist of four (4) members who shall be appointed, one in each year, by the Administrative Council Chair (Secretary of the Forum) to serve overlapping terms of four (4) years each. The senior member in terms of service on this committee shall be the chairman. The Secretary shall serve as an Ex-Officio member of this Committee. The primary responsibility of the Committee on Issues will be the monitoring and interpretation of health care related issues. This will include responding in a timely manner to legislative and other issues of importance to the Forum, as well as investigation charges of unethical or unprofessional conduct, including erroneous medico legal testimony, by Forum members. The Committee shall present its observations and recommendations for action to the Executive Committee.

f. The Honorary Membership Committee shall consist of the three (3) most immediate past Presidents on the Executive Committee of the Forum. The most senior member shall serve as Chair. The Committee shall be responsible for reviewing candidates for Honorary Membership status and recommending actions to the Executive Committee.

4. The Research Council will consist of the chairs of the Research, Outcomes, Guidelines, and Grants and Awards committees (the Research committees) under the direction of the Research Council chair. The chair of the Research Council will serve as an ex-officio member of all committees of the Council.

a. The Research Committee will oversee all research activities sanctioned by the American Venous Forum. The responsibilities of this Council shall also include promotion of research in venous diseases; definition of areas of requiring multi-center clinical efforts; and promotion of research investment in venous disease by national granting agencies. The chair of the Research Committee will be appointed by the Research Council Chair of the Forum to serve a two (2) year term. Members of the Research Committee will be appointed by the chair of the Research Committee, and serve a two (2) year term.

b. The Outcomes Committee will be responsible for the creation and maintenance of all outcome measures and reporting standards produced under the auspices of the Forum. The chair of the Outcomes committee will be appointed by the Research Council Chair of the Forum to serve a two (2) year term. The chair of the Outcomes Committee will appoint members of the Outcomes Committee to two (2) year terms.

c. The Practice Guidelines Committee will be responsible for the creation and maintenance of all evidence-based practice guidelines produced under the auspices of the Forum. The chair of the Practice Guidelines committee will be appointed by the Research Council Chair of the Forum to serve a two (2) year term. The chairman of the Outcomes Committee will appoint members of the Practice Guidelines Committee to two (2) year terms.

d. The Grants & Awards Committee will be responsible for the selection of the recipients of all recurring grants and awards administered by the Forum. The Grants & Awards Committee shall consist of three (3) members who shall be appointed, one in each year, by the Research Council Chair to serve overlapping terms of three (3) years each. The senior member in terms of service on this committee shall be the chair.

5. The Education Council will consist of the chairs of the Fellow's Education, Patient Education, Physician/Allied Health Education, Website, and National Venous Screening Program committees (the Education committees) under the direction of the Education Council chair. The chair of the Education Council will serve as an ex-officio member of all committees of the Council.

a. The Fellow's Education Committee will be responsible for all components of resident and fellow's education in venous and lymphatic disease. Responsibilities will include development and maintenance of the fellow's venous curriculum as well as development and oversight of all fellow's courses held under the auspices of the Forum. The Committee shall consist of four (4) members who shall be appointed, one in each year, by the Education Council Chair to serve overlapping terms of four (4) years each. The senior member in terms of service on this committee shall be the chair.

b. The Patient Education Committee will be responsible for the creation, maintenance, and distribution of all layman's educational materials produced by or under the auspices of the Forum. The chair of the Patient Education committee will be appointed by the Education Council Chair of the Forum to serve a two year term. The chair of the Committee will appoint members of the Patient Education Committee to serve two (2) year terms.

c. The Physician and Allied Health Education Committee will be responsible for the creation, maintenance, and distribution of all professional educational materials produced by or under the auspices of the Forum. The chair of the Physician and Allied Health Education committee will be appointed by the Education Council Chair of the Forum to serve a two (2) year term. The chair of the Committee will appoint members of the Physician and Allied Health Education Committee to serve (2) year terms.

d. The Website Committee will be responsible for maintenance of the Forum's website. The chair of the Website committee functions as webmaster and will be appointed by the Education Council Chair of the Forum to serve a two (2) year term. The chair of the Committee will appoint members of the Website Committee to two (2) year terms.

e. The National Venous Screening Program Committee all activities associated with the screening program. The chair of the Screening Committee will be appointed by the Education Council Chair of the Forum to serve a three (3) year term. The chair of the Committee will appoint members of the Physician and Allied Health Education Committee to three (3) year terms.

6. The Development Council will consist of the chairs of the Fundraising/Strategic Planning, Public and Industrial Relations, and Intersocietal Relations committees (the Development committees) under the direction of the Development Council co-chairs. The chair of the Industrial Advisory Committee will also serve as a council member. The co-chairs of the Development Council will serve as an ex-officio member of all committees of the Council.

   a. The Fundraising/Strategic Planning committee will oversee all long-term fundraising activities of the Forum in conjunction with administrative staff and any outside consultants. The Committee shall consist of the co-chairs of the Development council and their designated appointees.

   b. The Public and Industrial Relations Committee shall consist of three (3) members who shall be appointed, one in each year, by the Co-Chairs of the Development Council to serve overlapping terms of three (3) years each. The senior member in terms of service on this committee shall be the chairs.

   c. The Intersocietal Relations Committee shall consist of three (3) members who shall be appointed, one in each year, by the Co-chairs of the Development Council to serve overlapping terms of three (3) years each. The senior member in terms of service on this committee shall be the chair.

7. The Executive Committee may from time to time establish such other committees as it deems advisable, including committees established to augment and assist the Research, Education and Development Councils Each such committee shall consist of such persons and shall have such duties and powers as may be designated by the Executive Committee upon establishment of the committee or from time to time thereafter. Unless otherwise provided by the Executive Committee, the President shall appoint the members of each such committee or council.

8. Any vacancy occurring among the members of any elected committee of the Forum shall be filled by appointment by the President, the appointee to serve until the next annual meeting of the Forum membership.

9. Members of the Executive Committee, Officers or a Committee may participate in any meeting thereof with a conference telephone or similar communications equipment by means of which all persons participating in the meeting can hear each other, and such participation in a Committee meeting shall constitute presence in person at the meeting.

Article VIII – Meetings

1. The annual business meeting of the Forum shall be held at a time and place to be determined by the Executive Committee.

2. The Executive Committee shall meet in the week prior to the annual meeting, at a time and place designated by the President. The Chair of the Membership Committee, and the Nominating Committee shall meet with the Executive Committee in an advisory capacity.

3. Twenty five (25) voting members present in person shall constitute a quorum at a meeting of the membership.

4. The vote of a majority of members present and voting at a duly called meeting at which a quorum is present shall be necessary for the adoption of any matter voted upon by the members, unless a greater proportion is required by the applicable statute, the Articles of Incorporation, or these Bylaws.

5. Members may not cast their votes by proxy.

6. The executive session of the Forum shall be held at a time and place to be set by the President. The business of the Forum shall be conducted at this time.

7. The scientific sessions at the annual meeting shall consist of presentations of posters and papers and the discussion of these papers.

8. From time to time when deemed advisable by the Executive Committee, eminent investigators in the field of venous disease or allied sciences may be invited to present a special lecture during the annual meeting. This lecture shall be know as the "D. Eugene Strandness, Jr., M.D. Memorial Lecture". Each speaker who presents such a lecture shall receive an appropriate honorarium and a certificate of appreciation from the Forum.

Article IX – Invited Guests

1. Any member of the Forum may invite one or more guests to attend the annual meeting of the Forum.

2. The names of all guests attending the annual meeting shall be entered under a separate heading in the attendance list.

3. All invited guests shall be given the privilege of the floor by the President, but shall not be present at the executive session.

Article X – Fees and Dues

1. Initiation fees and assessments shall be proposed by the Executive Committee and approved by the membership at an annual executive session. The Executive Committee shall set dues for membership in all categories from time to time and publish same to the membership at the annual business meeting.

2. Any member of the Forum in arrears as to dues for one (1) year shall be notified of that fact by the Treasurer, by registered letter, which shall contain a copy of this Section 2. If the dues are not paid before the next annual business meeting or if some reasonable explanation of the delinquency is not forthcoming, the name of the delinquent member shall be presented at that Executive Committee meeting and, on a majority vote of the Executive Committee, the name may be stricken from the membership list. The Executive Committee may reinstate the delinquent member upon his payment of the dues in arrears.

Article XI – Resignations and Discipline

1. Resignations of members not in arrears as to dues may be accepted at any annual executive committee meeting by a majority vote of the members present.

2. Charges of unprofessional or unethical conduct may be brought against any member of the Forum by written complaint signed a member of the Forum and delivered to the Secretary. The Issues Committee will investigate said complaints and present them to the Executive Committee. The rules governing disciplinary proceedings based upon such charges shall be as established from time to time by the Executive Committee.

Article XII – Papers and Reports

1. All papers and reports read before the Forum shall be delivered to the Recorder at the time of their presentations and submitted online as directed by the Recorder.

2. No paper shall be published as having been read before the Forum unless it has been read by title or otherwise before the Forum.

Article XIII – Procedure

The proceedings of the Forum shall be conducted under Robert's Rules of Order Newly Revised and as amended from time to time.

Article XIV – Certificate of Membership

Every elected member of the Forum shall be entitled to a certificate of membership signed by the President and Secretary.

Article XV – Fiscal Year

The fiscal year of this corporation shall begin on the first of January in each year and shall run through the 31st day of December in that year.

Article XVI – Notice and Waiver of Notice

1. Whenever under applicable law, these By laws, or a resolution of the Executive Committee, notice is required to be given to any member, Executive Committee member or officer, such notice may be given in writing, by mail, addressed to such member, Executive Committee member or officer at his or her address as it appears on the records of the Forum. Such mailed notice shall be deemed to have been given when deposited in the United States mail in a sealed envelope so addressed, with postage thereon prepaid.

2. Whenever, under applicable law, these By laws or a resolution of the Executive Committee, any notice is required to be given, a waiver thereof in writing, signed by the person or persons entitled to such notice, whether before or after the time stated therein, shall be deemed equivalent to the giving of such notice. In addition, the attendance of a member or Executive Committee member at any meeting shall constitute a waiver of notice of such meeting, except where an individual attends the meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

Article XVII – Indemnification

1. To the full extent specifically authorized by, and in accordance with the procedures prescribed in Section 108.75 of the Illinois General Not for Profit Corporation Act of 1986 (or the corresponding provisions of any future statute applicable to corporations organized under the Act), the Forum shall indemnify any and all members of the Executive Committee (which members shall hereinafter in this

Article be referred to as "Directors") and any and all of its officers, committee members, employees, agents and other authorized representatives for expenses and other amounts paid in connection with legal proceedings (whether threatened, pending or completed) in which any such person became involved by reason of serving in any such capacity for the Forum.

2. Upon specific authorization by the Executive Committee, the Forum may purchase and maintain insurance on behalf of any or all directors, officers, employees, agents or representatives of the Forum against any liability asserted against any such person and incurred in any such capacity, or arising out of the status of serving in any such capacity, whether or not the Forum would have the power to indemnify them against such liability under the provisions of Section I of this Article.

Article XVIII – Amendment

These By laws may be amended by a three fourths vote of the members present and voting at a properly called and convened of an annual business meeting or special meeting of the Forum provided that the proposed amendment has been submitted to the Secretary by at least three (3) voting members of the Forum at least three (3) months prior to the executive session of the Forum. The Secretary shall mail the proposed amendment to all voting members at least thirty (30) days prior to the executive session, accompanied by notice that such amendment will be acted upon at that business meeting.

PROVISO TO THE BY LAWS

Article I

Effect of Proviso

This Proviso to the By laws (the "By laws") of the American Venous Forum, an Illinois not for profit corporation (the "Forum"), shall control and supersede the rules and regulations for the governance of the Forum contained in the By laws as of the date on which they are adopted. Except as specifically modified by this Proviso, all other provisions of the By laws shall remain in full force and effect.

Article II

Officers

The initial members of the Executive Committee of the Forum, which members are named in the Articles of Incorporation of the Forum as filed with the Illinois Secretary of State on February 7, 1989 shall elect the initial officers of the Forum from among the members of the Executive Committee. The officers so elected shall serve until the next annual executive session of the members of the Forum and until their successors shall have been elected and qualified.

DRAFTED: October 23, 1988
ADOPTED: February 22, 1989
AMENDED: February 19, 1999
AMENDED: February 16, 2007
AMENDED: February 22, 2008

AMERICAN VENOUS FORUM

Authors Index

IS YOUR AVF MEMBERSHIP INFORMATION CURRENT?

For Example:

- Do you have a new email address?
- Do you have a new address or phone number?

Please let us know so that your AVF records stay current and that all important updates and news reach you!

PLEASE PRINT

First M Last Suffix

Email Address

Daytime Phone Fax

MAILING ADDRESS

Institution

Street

City State Zip Country

Please return your completed form to the AVF Registration Desk, or fax your form to 978-744-5029.