



AMERICAN VENOUS FORUM

20th ANNUAL MEETING

February 20-23, 2008

Charleston Place, Charleston, South Carolina

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THE 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.

The Foundation also oversees the education and objectives of the Venous Education Institute of North America (VEIN).
www.venous-info.org

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J. Leonel Villavicencio, M.D.

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

The Society for Vascular Surgery
American Association of Vascular Surgery
The Canadian Society for Vascular Surgery

WITH THE SUPPORT OF MEMBERS OF

The International Union of Phlebology
The North American Society of Phlebology
The 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
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Société Francaise d'Angéiologie
Societa Italiana de Patologia Vascolare
Pan American Society of Phlebology and Lymphology
Sociedad Argentina de Flebologia y Linfologia
The Australian and New Zealand Society of Phlebology

THE AMERICAN VENOUS FORUM ANNUAL MEETINGS/PAST PRESIDENTS

1989	Feb. 22-24	New Orleans, LA.....	John J. Bergan, M.D. Fairmont Hotel
1990	Feb. 21-23	Coronado, CA.....	Norman M. Rich, M.D. Hotel Del Coronado
1991	Feb. 20-22	Ft. Lauderdale, Fl.....	Lazar J. Greenfield, M.D. Marina Marriott Hotel
1992	Feb. 26-28	Coronado, CA.....	Michael Hume, M.D. Hotel Del Coronado
1993	Feb. 24-26	Orlando, FL.....	George Johnson, Jr., M.D. Hilton Walt Disney World Village
1994	Feb. 23-25	Mauí, HI.....	James A. DeWeese, M.D. Maui Inter-Continental Resort
1995	Feb. 23-25	Fort Lauderdale, FL.....	Robert Hobson, M.D. Marriott Harbor Beach
1996	Feb. 22-24	San Diego, CA.....	Robert L. Kistner, M.D. Hyatt Regency Hotel
1997	Feb. 20-23	San Antonio, TX.....	James S. T. Yao, M.D. Hyatt Regency Hill Country Resort
1998	Feb. 19-21	Lake Buena Vista, FL.....	D. Eugene Strandness, Jr., M.D. Walt Disney World Swan Hotel
1999	Feb. 18-21	Dana Point, CA.....	Thomas F. O'Donnell, Jr., M.D. Laguna Cliffs Marriott Resort
2000	Feb. 3-6	Phoenix, AZ.....	David S. Sumner, M.D. Hilton South Mountain Resort
2001	Feb. 22-25	Ft. Myers, FL.....	Anthony J. Comerota, M.D. Sanibel Harbor Resort
2002	Feb. 21-24	La Jolla, CA.....	Gregory L. Moneta, M.D. Hilton Torrey Pines La Jolla
2003	Feb. 20-23	Cancun, Mexico.....	Peter Gloviczki, M.D. Hilton Cancun Beach Resort
2004	Feb. 26-29	Orlando, FL.....	Frank T. Padberg, M.D. Gaylord Palms Resort
2005	Feb. 9-13	San Diego, CA.....	Bo G. Eklöf, M.D. Loews Coronado Bay Resort
2006	Feb. 22-26	Miami, FL.....	Thomas W. Wakefield, M.D. InterContinental Hotel
2007	Feb. 14-17	San Diego.....	Michael C. Dalsing, M.D. Rancho Bernardo Inn

AMERICAN VENOUS FORUM D. EUGENE STRANDNESS JR., M.D. MEMORIAL LECTURE

Each year, the American Venous Forum 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, is named to the position of D. Eugene Strandness Jr., M.D. Memorial Lecturer and serves as the Keynote Speaker on a topic of his or her choice at the Annual Meeting of the Forum.

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

- 2007 Robert L. Kistner, M.D., Honolulu, Hawaii
"Foresight 2020: Creating the Venous Vision"
- 2006 Pan Ganguly, Ph.D., Bethesda, MD
"The Challenges in Venous Thrombosis"
- 2005 Michel R. Perrin, M.D., Chassieu, France
"The Importance of International collaboration for the Development of a Scientific Approach to Venous Disease"
- 2004 Professor Eberhard Rabe, M.D., Bonn, Germany
"Prevalence and Risk Factors of Chronic Venous Diseases: The Bonn Vein Study"
- 2003 Professor Claudio Allegra, M.D., Rome, Italy
"Involvement of the Microcirculation in Chronic Venous Insufficiency"
- 2002 Professor Alfred Bollinger, M.D., Professor Emeritus, University of Zurich
"Microcirculation in Chronic Venous Insufficiency and Lymphedema"
- 2001 Professor C.V. Ruckley, M.D., Edinburgh, Scotland
"Chronic Venous Insufficiency: Lessons from Scotland"
- 2000 Professor Sir Norman Browse, M.D., F.R.C.S., F.R.C.P.
"Forty Years On"
- 1999 David Robinson, PhD, Bethesda, Maryland
"A Journey to Complexity: The Continuing Evolution in Vascular Research"
- 1998 David Bergquist, M.D., Ph.D., Uppsala, Sweden
"A Chronic Leg Ulcer - The Impact of Venous Disease"

- 1997 Professor Kevin G. Burnand, London, England
"A Venous Thrombogene is and Thrombolysis"
- 1996 Ermenegildo A. Enrici, M.D., 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, M.D., FRCS, London, England
"Venous Disease and Leukocyte Mediated Microcirculatory Injury"
- 1994 Andrew W. Nicolaidis, M.D., FRCS, London, England
"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, M.D., Ph.D., Linkoping, Sweden
"Vein Wall Characteristics and Valvular Functions in Chronic Venous Insufficiency"
- 1992 G. W. Schmid-Schonbein, M.D., La Jolla, California
"Leukocytes as Mediators of Tissue Injury"
- 1991 Jack Hirsh, M.D., Hamilton, Ontario, Canada
"Development of Low Molecular Weight Heparin for Clinical Use"
- 1990 Hugo Partsch, M.D., Vienna, Austria
"Diagnosis of AV Fistulas in Vascular Malformations"

AMERICAN VENOUS FORUM FOUNDATION RESEARCH AWARD

Each year The American Venous Forum Foundation offers a cash prize for up to three (3) abstracts on clinical or experimental work in venous diseases performed by residents in training, fellows and young physicians and surgeons in practice for less than five years



THE BSN-JOBST RESEARCH FELLOWSHIP IN VENOUS AND LYMPHATIC DISEASE

In 1995, The American Venous Forum Foundation announced the establishment of the BSN-Jobst, Inc. Research Fellowship in Venous and Lymphatic Disease.

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

The BSN-Jobst, Inc. 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 Forum Finale.



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, and 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.

- 1997 Mark H. Meissner, M.D., University of Washington
Medical Center
- 1998 Paul R. Cordts, M.D., Triple Army Medical Center
- 1999 E. John Harris, Jr., M.D., Stanford University Medical Center
- 2000 Harold J. Welch, M.D., Lahey Clinic Medical Center
- 2001 David L. Gillespie, M.D., Uniformed Services University
of the Health Sciences
- 2002 Joseph D. Raffetto, M.D., Boston Medical Center
- 2003 Audra Noel, M.D., Mayo Clinic
- 2004 Robert McLafferty, M.D., Southern Illinois University
- 2005 Antonios P. Gasparis, M.D., Stony Brook University
- 2006 Beverly Sharp, M.D., Charing Cross Hospital
Biju Aravind, M.D., Charing Cross Hospital
- 2007 Alisha Oropallo, M.D., Boston Medical Center
M. K. Barsoumi, M.D., Mayo Clinic
Prandath Lall, M.D., Mayo Clinic
Eugene Palchick, M.D., University of Rochester



SERVIER TRAVELING FELLOWSHIP

The Servier Traveling Fellowship provides two fellows an opportunity to travel to France and Spain for the 2008 European Venous Forum to present his or her scientific research. Up to 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 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, M.D., Indiana University School of Medicine
Gustavo Oderich, M.D., Mayo Clinic

2007

Brian Knipp, M.D., University of Michigan
Reagan Quan, M.D., Walter Reed Army Medical Center

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.

2007 Winners:

Hemodynamic and Clinical Impact of the Lateral Embryonic Vein In Limbs With Klippel-Trenaunay Syndrome

K. Delis, P. Gloviczki, P. Wennberg, T. Rooke, D.J. Driscoll – Mayo Clinic, Rochester, MN

Abdomino Pelvic Venous Assessment With Duplex Ultrasound (Transvaginal and Transparietal)

A. Sanchez, J. Leal, S. Zubicoa, L. Del Campo, F. Sainz – Hospital Ruber Internacional, Madrid, Spain

Impaired Cerebral Venous Hemodynamics In Multiple Sclerosis Patients

P. Zamboni, E. Menegatti, A. Legnaro, S. Gianesini, E. Fainardi, A. Liboni – University of Ferrara, Ferrara, Italy

GENERAL INFORMATION

REGISTRATION DESK

The Registration Desk will be located in the Gazebo (Charleston Place) and will be open during the following hours:

Tuesday, February 19	2:00 pm - 6:00 pm
Wednesday, February 20	7:00 am - 6:00 pm
Thursday, February 21	7:00 am - 6:00 pm
Friday, February 22	7:00 am - 12:30 pm
Saturday, February 23	7:00 am - 4:00 pm

REGISTRATION INFORMATION

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 Welcome Reception, continental breakfast, mid-morning refreshments daily in the Hospitality Suite and the Forum Finale on Saturday evening.

ANNUAL BUSINESS MEETING LUNCH (Members Only)

The Annual Business Meeting will be held on Friday, February 22, 2008 at 12:00 pm in the Riviera Ballroom.

SPECIAL NEEDS

If you have a disability that requires special accommodations or assistance, please contact the AVF Administrative Offices prior



to the start of the Annual Meeting. Please advise the AVF



Administrative Offices if you have any food allergies or dietary restrictions prior to the start of the Annual Meeting.

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 2-hours prior to their scheduled presentation.

Manuscripts. The American Venous Forum has a publication agreement covering papers from this meeting. Therefore, presenting authors of oral presentations **must** submit the full manuscript to the Journal of Vascular Surgery within 30-days of presentation. You must conform strictly with their guidelines when preparing your manuscript. All submissions to the Journal of Vascular Surgery must be made before the presentation date.

INDUSTRY PARTNERS

A select group of companies have been invited to participate in the Annual Meeting through sponsored symposia and exhibits. Sponsored symposia are listed in the program. The exhibits will feature the latest products for diagnosis and treatment of venous disease. Exhibits will be located in the Live Oak/Cypress/Dogwood Ballrooms. Continental breakfasts and refreshment breaks will be scheduled in the Exhibit Hall to give participants an opportunity to visit the various companies in attendance.

The Executive Committee and members of the American Venous Forum are most grateful to the following companies for their support of the Annual Meeting.

PLATINUM

Angiodynamics
Jobst
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GOLD

Bacchus Vascular
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GE Healthcare
Healthpoint, Ltd.
Organogenesis, Inc.
Possis Medical, Inc.
Sonosite
Terason Ultrasound



AMERICAN VENOUS FORUM

20th ANNUAL MEETING

February 20-23, 2008

Charleston Place, Charleston, South Carolina

WEDNESDAY, FEBRUARY 20, 2008

7:00 am

Continental Breakfast

7:30 am

POSTGRADUATE COURSE

IN THE ERA OF PAY FOR PERFORMANCE OUTCOMES ASSESSMENT IN VENOUS DISEASE: MEASUREMENT TOOLS AND RESULTS REPORTING

Educational Objectives:

At the conclusion of the Postgraduate Course, the attendees will be able to:

- 1. Identify outcome tools and measurements*
- 2. Assess the results of treatment for venal caval filters, DVT, lymphedema and ulcer therapy*
- 3. Assess compression devices and garments, clot extraction and superficial venous reflux*

Additionally, databases and information systems, non-invasive testing and ICAVL reporting standards, severity of illness assessment tools and quality of life measurements will be presented. The participant will also gain an understanding of the international training requirements and recommendations for the non-vascular specialist.

Session I

Introduction

Joann Lohr, MD

Vena Caval Filters: Fact or Fiction

David L. Gillespie, MD

Deep Venous Reconstruction: Stents and Valves

Peter Neglen, MD

Lymphedema and Ulcer Therapy: Compressions Devices and Garments

Joseph Raffetto, MD

Noninvasive Testing and ICAVL Reporting Standards

Eugene R. Zierler, MD

Vascular Training Requirements and Recommendations For Nonvascular Specialists

Bo Eklof, MD

Question and Answers & Discussion

9:30 – 10:00 am

Coffee Break

Session II

Severity of Illness Assessment Tools and Quality of Life

Michael Vasquez, MD

Thrombolysis – Who, What, When, Where, How For Clot Removal

Anthony Comerota, MD

Superficial Venous Reflux, Compression, and Nonoperative Therapy

Marc A. Passman, MD

Superficial Venous Reflux Interventional Options

Nick Morrison, MD

Databases and Information Systems

Brenda K. Zierler, PhD

Question and Answer

12:00pm

Conclusion

12:00 pm

Lunch (Boxed Lunch To Be Provided)

1:00 pm

ASK THE EXPERTS: DEEP ENDOVENOUS PROCEDURES

Moderator: Peter Neglen, MD

Educational Objectives:

- 1. To be aware of technical aspects of venous stenting*
- 2. To realize its role in chronic venous disease*
- 3. To recognize its adjuvant role in early clot removal*

*Panelists: Haraldur Bjarnason, MD
David Gillespie, MD
Anthony Gasparis, MD*

3:00 pm

Coffee Break

3:30 pm

SCIENTIFIC SESSION I: Endovenous

Moderators: Mark Meissner, MD

Lowell Kabnick, MD

Educational Objectives:

- 1. Upon completion of this session attendees will understand:*
- 2. An in depth analysis of endovenous ablative therapies comparing costs with open procedures.*
- 3. Evaluating quality of life and disease severity outcomes when treating the superficial system with concomitant deep system reflux.*
- 4. The safety of endovenous ablative procedures in patients that have or have had deep venous thrombosis.*
- 5. Deciding if there is a benefit in performing immediate or staged adjunctive phlebectomy with endovenous ablation.*
- 6. The importance of inflammatory markers in venous ulcer, and the affect of compression therapy on changes in cytokines levels and healing.*
- 7. The importance of foam sclerotherapy in treating unusual varices of the sciatic nerve utilizing Duplex ultrasound guidance.*

3:30 pm

1. Radiofrequency Ablation Versus Conventional Surgery For Varicose Veins - A Comparison of Costs

S. Subramonia¹, T. Lees² - ¹Queen's Medical Centre, Nottingham, United Kingdom, ²Freeman Hospital, Newcastle upon Tyne, United Kingdom

3:50 pm

2. Endovenous Laser Ablation Improves Venous Outcomes Irrespective of the Presence of Deep Venous Insufficiency

B. S. Knipp, F. Mansoor, M. Hong, J. Bloom, E. Fellows, S. Blackburn, G. Adams, J. Pfeifer, D. Williams, T. Wakefield - University of Michigan, Ann Arbor, MI

4:10 pm

3. Radiofrequency Ablation of the Great Saphenous Vein In Patients With Previous Venous Thrombosis: Is It Safe?

A. Puggioni, N. Marks, A. Hingorani, A. Shiferson, E. Ascher - Maimonides Medical Center, Brooklyn, NY

- 4:30 pm **4. Mid-Term Results of the Surgical Treatment of Varices By Phlebectomy With Conservation of A Refluxing Saphenous Vein**
P. Pittaluga¹, S. Chastanet¹, J. J. Guex² - ¹Riviera Veine Institut, Nice, France; ²Cabinet de Medecine Vasculaire, Nice, France
- 4:50 pm **5. Endovenous Laser Therapy With Concomitant Or Sequential Phlebectomy: A Randomized Controlled Trial**
A. I. Mekako, J. Hatfield, M. N. Abdul Rahman, S. Gulati, P. T. McCollum, I. C. Chetter - Hull Royal Infirmary/University of Hull, Hull, United Kingdom
- MINI PRESENTATIONS**
- 5:10 pm **6. (Mini Presentation 1) Foam Sclerotherapy of Venous Malformations**
V. Cheng – San Diego Vein Institute, Encinitas, CA
- 5:15 pm **7. (Mini Presentation 2) The Echo-Guided Sclerotherapy In Sciatic Nerve Varices Treatment**
S. Giancesini, G. Tacconi, A. Palazzo, P. Fortini, E. Righi, E. Menegatti, A. Liboni, P. Zamboni - Ferrara University, Ferrara, Italy
- 6:00 pm **Welcome Reception**

THURSDAY, FEBRUARY 21, 2008

7:00 am Continental Breakfast / Exhibits Open

8:00 am

SCIENTIFIC SESSION II: Basic

Moderators: Joseph Raffetto, MD & David L. Gillespie, MD

Educational Objectives:

- 1. Upon completion of this session attendees will gain knowledge in:*
- 2. The importance of microparticles in the formation of venous thrombosis.*
- 3. The influence of matrix metalloproteinases (MMPs) in the venous ulcer wound environment, and how the composition of MMPs may affect venous ulcer wound healing.*
- 4. The importance of physiologic age on thrombus formation and resolution.*
- 5. How MMPs affect venous relaxation by altering the calcium entry into smooth muscle.*
- 6. Important novel hemodynamic measurements in defining chronic venous disease.*
- 7. Neovascularization and a novel treatment algorithm.*
- 8. Determining if cryo-venous stripping has any advantages over traditional stripping of the great saphenous vein.*

8:00 am

8. Microparticles Surface Proteins Influence Venous Thrombogenesis

N. M. Abdullah, M. Kachman, A. Walker, A. E. Hawley, S. K. Wroblewski, D. D. Myers, Jr., J. R. Strahler, P. C. Andrews, P. K. Henke, T. W. Wakefield - University of Michigan, Ann Arbor, MI

8:20 am

9. Inflammatory Cytokine Levels In Chronic Venous Insufficiency Ulcers Before and After Compression Therapy

S. Beidler, C. Douillet, D. Berndt, P. Rich, W. Marston - University of North Carolina at Chapel Hill, Chapel Hill, NC

8:40 am

10. The Matrix Metalloproteinase (MMP) Profile In The Venous Ulcer Bed May Provide A Prognostic Indication of Ulcer Healing

J. Tan, A. Smith, K. Burnand - Academic department of Surgery, Cardiovascular Division, London, United Kingdom

9:00 am

11. The Prothrombotic Effects of Aging On Acute Venous Thrombosis In A Rodent Model

A. P. McDonald, T. R. Meier, A. E. Hawley, J. N. Thibert, D. M. Farris, S. K. Wroblewski, P. K. Henke, T. W. Wakefield, D. D. Myers, Jr. - University of Michigan, Ann Arbor, MI

- 9:20 am **12. MMP-2 Induced Venous Relaxation Via Inhibition of Ca²⁺ Entry-Dependent Mechanisms of Venous Smooth Muscle Contraction**
J. D. Raffetto¹, R. Khalil² - ¹VA Boston Healthcare System, West Roxbury, MA, ²Brigham and Women's Hospital, Boston, MA

MINI PRESENTATIONS

- 9:40 am **13 (Mini Presentation 3)**
Doppler Derived Maximum Venous Outflow Velocity (MVOV) Demonstrates Asymmetric Lower Extremity Venous Flow In Normal Individuals
M. Lebaw, D. Cassada, O. Grandas, S. Stevens, M. Freeman, M. Goldman - UT Knoxville, Knoxville, TN

- 9:45 am **14 (Mini Presentation 4)**
Neovascularity and It's Treatment After Saphenous Ligation
R. Bush, K. Hammond - Midwest Vein and Laser Center, Dayton, OH

- 9:50 am **15 (Mini Presentation 5)**
Cryo Strip Versus Classic Strip of the Great Saphenous Vein
T. M. A. L. Klem¹, J. M. Schnater², P. R. Schutte³, A. C. van der Ham⁴, C. H. A. Wittens⁵ - ¹Erasmus Medical Center, Rotterdam, Netherlands; ²Academisch Medical Center, Amsterdam, Netherlands; ³Albert Schweitzer Hospital, Dordrecht, Netherlands; ⁴Sint Franciscus Hospital, Rotterdam, Netherlands; ⁵Haga Hospital, The Hague, Netherlands

10:00 am Coffee Break

SCIENTIFIC SESSION III: FOAM & DIAGNOSTICS

Moderator: Peter Pappas, MD

Educational Objectives:

- 1. Upon completion of this session attendees will understand:*
- 2. If positioning of the patient undergoing foam sclerotherapy is important in preventing foam particle central migration.*
- 3. The application of Duplex ultrasound and MRI in understanding the mechanism of pneumatic compression on the venous and muscles of the lower extremity.*
- 4. The advantages or disadvantages in a randomized trial comparing treatment of varicose veins by surgery versus foam sclerotherapy.*
- 5. The objectives of the National Venous Screening Program, how the NVSP has impacted the perception and education of the public and practitioners, and future direction in establishing nation-wide screening with emphasis on, risk of venous thromboembolism, venous clinical severity, primary care education, and timely specialty care referral and treatment.*

6. The changes of MMPs and its naturally occurring inhibitors in the venous wall of varicose veins, and how this may impact on pathophysiology.

7. Demographic and risk factors that can effect pain following endovenous ablation.

- 10:30 am **16 Assessment of Techniques To Reduce Sclerosant Foam Migration During Ultrasound Guided Sclerotherapy**
D. A. Hill, R. Hamilton – The Vein Treatment Centre, Calgary, AB, Canada
- 10:50 am **17 Combined MRI and Duplex Ultrasound Investigation of the Mechanism of Action of the Pneumatic Compression Devices**
F. Lurie¹, H. Yoon², V. Scott³, R. L. Kistner¹ – ¹University of Hawaii and Kistner Vein Clinic, Honolulu, HI, ²Hawaii Permanente Medical Group, Inc., Honolulu, HI, ³Keck School of Medicine USC, Los Angeles, CA
- 11:10 am **18 Comparison Between Surgical Treatment and Ultrasound-Guided Microfoam Sclerotherapy For Patients With Primary Varicose Veins In the Lower Limbs: Early Results of A Randomized Controlled Trial**
M. Figueiredo, S. P. Araujo, F. Miranda Jr. - Escola Paulista de Medicina - Unifesp, Uberlandia, Brazil

MINI PRESENTATIONS

- 11:30 am **19 (Mini Presentation 6)**
National Venous Screening Program – An Update
Marc Passman, MD
- 20 WITHDRAWN**
- 11:35 am **21 (Mini Presentation 8)**
Patient Characteristics and Treatment Factors That Affect Pain Following Endovenous Laser Treatment (EVL) For Venous Insufficiency
P. A. Hertzman, B. Peterson² - ¹Vein Care of New Mexico, Los Alamos, NM, ²University of New Mexico, Albuquerque, NM

12:00 pm

AMERICAN COLLEGE OF PHLEBOLOGY SCLEROTHERAPY SESSION

Moderator: Steve Zimmet, MD & Nick Morrison, MD

Educational Objectives:

1. *Better utilize sclerotherapy to treat incompetent varices*
2. *Minimize risk of complications of sclerotherapy*
3. *Understand issues related to the importation, compounding and off-label use of sclerosants*

12:00 pm

Office Set-Up and Sclerotherapy Techniques

Nick Morrison, MD

12:15 pm

Sclerotherapy: Cleaning Up Before & After Endovenous Laser

Robert Min, MD

12:30 pm

X-Ray Guided Sclerotherapy

Mel Rosenblatt, MD

12:45 pm

Sclerosants: Importation, Compounding and Off- Label Use

Steve Zimmet, MD

1:30-5:50 pm

INDUSTRY WORKSHOPS (Three 80-Minute Sessions)

Ultrasound Investigations for Venous Disease

Moderator: Nicos Labropoulos, MD

Educational Objectives:

1. *Understanding of basic normal venous anatomy identified by venous ultrasound.*
2. *Understanding of diagnostic criteria for venous thrombosis using venous ultrasound.*
3. *Understanding of diagnostic criteria for venous insufficiency (deep, superficial, perforator) using venous ultrasound*

Endovenous Ablation of the Saphenous Vein

Moderator: Michael Vasquez, MD

Educational Objectives:

1. *Understand and perform U/S guided access of an enlarged saphenous vein based on practice on a model.*
2. *Discuss the importance and technique of intra-compartmental tumescent anesthesia for the performance of endovenous saphenous vein ablation.*
3. *Identify different modalities of saphenous vein ablation for possible integration into their practice.*

Pharmaco-Mechanical Thrombectomy (PMT)

Moderator: Peter Lin, MD

Educational Objectives:

1. Understand endovascular treatment strategies of acute deep venous thrombosis.
2. Understand the role of mechanical thrombectomy in the treatment of acute deep venous thrombosis
3. Be familiar with various mechanical thrombectomy devices in the treatment of acute deep venous thrombosis.
4. Have insight into potential applications of pharmacomechanical thrombectomy in acute deep venous thrombosis.

Venous Ulcer Wound Care

Moderator: William Marston, MD

Educational Objectives:

1. Evaluate various methods of compression and the advantages and disadvantages of each in the treatment of venous leg ulcers
2. Consider the vast range of products available to apply to the wound surface of venous leg ulcers and learn strategies to choose the best ones for each leg ulcer
3. Review the active therapies available that are proven to accelerate the healing of leg ulcers and demonstrate proper application techniques for these products

OR CONCURRENT SYMPOSIUM SESSION

1:30 – 2:50 pm

Venous Coding and Maximizing Reimbursement

Moderator: Robert Zwolak, MD

Educational Objectives:

1. Use appropriate category one CPT codes to report standard venous operations
2. Understand the requirements for development of new CPT codes
3. Have a working familiarity with the method by which CPT codes are valued

3:00 – 4:20 pm

Venographic Assessment

Moderator: David Gillespie, MD

Educational Objectives:

1. Understand the indications and techniques for performing ascending venography
2. Understand the indications and techniques for performing ilio/cavography
3. Understand the indications and techniques for performing ovarian vein/pelvic dumping imaging

3:00 – 3:15 pm

Ascending/Decending Venography

David Gillespie, MD

- 3:15 – 3:30 pm **Venographic Assessment of Pelvic Congestion Syndrome**
Mark Meissner, MD
- 3:30 – 3:45 pm **Extremity Venography For Venous TOS**
Marc Passman, MD
- 4:30 – 5:50 pm **What To Do With Recurrent Varicose Veins?**
Moderator: Andre van Rij, MD
Educational Objectives:
 1. Understand the causes of recurrence of varicose veins and the role that neovascularisation has in this
 2. Gain a basic understanding of the biology of neovascularisation, and recanalisation,
 3. Be aware of how this varies with different treatments of varicose veins and how it might be prevented.
 4. Be familiar with treatments for recurrence and their relative merit.
 5. Have a rationale for counseling patients regarding the risk of recurrence following varicose vein treatment.

PLEASE NOTE: The following evening symposium is included in the registration fee for physicians and allied health professionals. However, seating is limited and pre-registration is required. We regret that due to strict codes, spouses and guests may not attend.
- 6:30 – 8:30 pm **EVENING SYMPOSIUM**
Supported by Bacchus Vascular and Sanofi Aventis.
THE TIMES THEY ARE A-CHANGING: VENOUS THROMBOEMBOLISM UPDATE 2008
Educational Objectives:
 1. Be familiar with the latest ACCP Chest Guidelines
 2. Understand current concepts regarding the treatment choices and duration of treatment for venous thromboembolism
 3. Understand the differences between iliofemoral thrombosis and other forms of venous thrombosis
- 6:30 – 6:50 pm **Putting New Joint Commission Quality Standards For DVT Into Hospital Practice**
Joseph Caprini, MD
- 6:50 – 7:10 pm **The Role of IVC Filter Placement In DVT Prophylaxis and Treatment**
David Gillespie, MD
- 7:10 – 7:30 pm **The Relationship Between the Location of Thrombosis and the Severity of the Post-Thrombotic Syndrome**
Peter Neglan, MD

7:30 – 7:50 pm

**Iliofemoral DVT Thrombus Removal Techniques:
Safe and Effective**
Michael Zatina, MD

7:50 – 8:10 pm

**Mechanolytic Intervention For Iliofemoral DVT
and the Need For A RCT**
Anthony Comerota, MD

8:10 – 8:30 pm

Panel Discussion/Q&A

FRIDAY, FEBRUARY 22, 2008

7:00 am Continental Breakfast / Exhibits Open

7:30 am

SCIENTIFIC SESSION IV: CHRONIC VENOUS DISEASE

Moderators: Michael Ricci, MD & Marc Passman, MD

Educational Objectives:

- 1. Upon completion of this session attendees will be able to:*
- 2. Understand the variability in venous Duplex laboratory reporting and the need for uniformity.*
- 3. Understand the important application of intravascular ultrasound in placement of vena cava filters in multi-trauma patients with emphasis on technique, anatomic variations, complications, and early durability.*
- 4. A novel technique utilizing an endovenous valve stent for treating patients with deep venous insufficiency.*
- 5. Understand the hemodynamic relation between the iliac venous system and the saphenofemoral junction.*
- 6. Appreciate the complex nature of varicose vein formation and chronic venous disease, and the role that hypoxia may have on its pathogenesis.*

7:30 am

22 Use of A Structured Audit Tool In Assessing Venous Duplex Reports

D. L. Wooster - University of Toronto, Toronto, ON, Canada

7:50 am

23 Intravascular Ultrasound Guided Inferior Vena Cava Filter Placement In the Multi-Trauma Patients From Global War On Terrorism: A Single Center Experience

G. Aidinian, A. A. Amin, P. W. White, E. Adams, C. J. Fox, M. Cox, D. L. Gillespie - Walter Reed Army Medical Center, Washington, DC

8:10 am

24 The Effect of Pressure On Migration and Further Characterization of the Venous Ulcer Fibroblast

G. Scriver, A. Stanley, M. A. Ricci, K. Corrow, M. Slusarczyk, S. Shackford, J. Adams, G. Steinthorsson, D. Berges, A. Howard - University of Vermont, Burlington, VT

8:30 am

EUROPEAN VENOUS FORUM – FIRST PLACE WINNER

Haemodynamic Assessment of Iliac Veins and Their Relation With the Sapheno-Femoral Junction

*P. Brazis¹, R. Piotrowicz¹, N. Labropoulos², A. Jawien¹
¹Department of Surgery, Collegium Medicum, Nicolaus Copernicus University, Bydgoszcz, Poland - ²Division of Vascular Surgery, University of Medicine & Dentistry of New Jersey New Jersey Medical School, Newark, NJ USA*

8:40 am

EUROPEAN VENOUS FORUM – SECOND PLACE WINNER

Is Hypoxia A Feature of Varicose Vein Disease?

B. Sharp^{1,2}, B. T. Navin¹, C. Monaco^{1,2}, E. Paleolog^{1,2}, A. H. Davies² - ¹Kennedy Institute of Rheumatology, Imperial College, London, UK; ²Charing Cross Hospital Department of Surgery, Oncology and Anaesthetics (SORA), Imperial College, London, UK

9:10 am

Coffee Break / Visit Exhibits

9:40 am

SCIENTIFIC SESSION V: ENDOVENOUS STENTING

Moderators: Robert McLafferty, MD & Peter Neglen, MD

Educational Objectives:

- 1. Upon completion of this session attendees will be able to:*
- 2. Understand the variability in venous Duplex laboratory reporting and the need for uniformity.*
- 3. Understand the important application of intravascular ultrasound in placement of vena cava filters in multi-trauma patients with emphasis on technique, anatomic variations, complications, and early durability.*
- 4. A novel technique utilizing an endovenous valve stent for treating patients with deep venous insufficiency.*
- 5. Understand the hemodynamic relation between the iliac venous system and the saphenofemoral junction.*
- 6. Appreciate the complex nature of varicose vein formation and chronic venous disease, and the role that hypoxia may have on its pathogenesis.*

9:40 am

25 Venous Stenting Across the Inguinal Ligament

P. Neglén, P. Tackett, S. Raju - River Oaks Hospital, Flowood, MS

10:00 am

26 Reinterventions After Venous Stenting For Chronic Venous Disease

S. Raju¹, P. Tackett², P. Neglén² - ¹University of Mississippi Medical Center, Jackson, MS, ²River Oaks Hospital, Flowood, MS

10:20 am

27 WITHDRAWN

10:20 am

Venous Stent Registry Update

BK Lal, MD

10:25 am

AVF Update – Where the Forum Is Going

Mark H. Meissner, MD

10:30 am

Founders Award (TBA)

Presented By: Mark H. Meissner, MD

10:35 am

2007 Award Update

Introduced By: Mark H. Meissner, MD

2007 BSN Jobst Winner – Report

Danny Vo, MD, Mayo Clinic

10:45 am

2007 Servier Traveling Fellowship Winners – Report

Brian Knipp, MD, University of Michigan

10:55 am

2007 Sigvaris Fellowship – Announcement

David Gillespie, MD for Reagan Quan, MD, Walter Reed Army Medical Center

11:00 am

PRESIDENTIAL ADDRESS

Mark H. Meissner, MD

Introduction By: Joann M. Lohr, MD

12:00 pm

MEMBER BUSINESS LUNCH

Free Afternoon

Golf & Tennis

SATURDAY, FEBRUARY 23, 2008

7:00 am Continental Breakfast – Visit Exhibits

8:00 am

SCIENTIFIC SESSION VI: VENOUS THROMBOEMBOLISM

Moderators: Joseph Caprini, MD & Peter Henke, MD

Educational Objectives:

1. Upon completion of this session attendees will be able to:
2. Understand the utilization of Duplex ultrasound in defining temporal changes of venous thrombi.
3. Understand the potential usefulness of combining d-dimer and lower extremity Duplex ultrasound tests in predicting outcome for venous thromboembolism in high risk patients undergoing surgery
4. Understand the complex and controversial management of pregnant females that had previous ilio-caval stenting.
5. Understand the benefits and limitations of diagnostic modalities in patients with suspected venous thromboembolism
6. Understand the indications, strategy, technical aspects, pharmacologic drugs, mechanical application, and outcomes in treating patients with iliofemoral deep venous thrombosis with pharmacomechanical thrombolysis.

8:00 am

28 Time-Course Analysis of Venous Thrombus With Ultrasonographic Tissue Elasticity Imaging - Preliminary Findings

K. Uno^{1,5}, A. Tonomura², T. Osaka², T. Mitake², M. Suda³, M. Yamakawa³, Y. Isaka⁴, S. Homma⁵, T. Shiina³, K. Aonuma⁵
- ¹Namegata District General Hospital, Namegata, Japan, ²Ultrasound Systems Division, Hitachi Medical Corporation, Kashiwa, Japan, ³Graduate School of System and Information Engineering, University of Tsukuba, Tsukuba, Japan, ⁴Medical Branch, Academic Service Office for Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Japan, ⁵Cardiovascular Division, Institute of Clinical Medicine, Graduate School of Comprehensive Human Science, University of Tsukuba, Tsukuba, Japan

8:20 am

29 Do Preoperative D-Dimer Testing and Venous Duplex Scanning of the Lower Extremities Alter the Outcome In Patients At High Risk For Postoperative Venous Thromboembolism?

T. Yamaki¹, M. Nozaki¹, H. Sakurai¹, M. Takeuchi², K. Soejima³, T. Kono¹ - ¹Tokyo Women's Medical University, Tokyo, Japan, ²Nihon University, Tokyo, Japan, ³Tokyo Metropolitan Hiroo General Hospital, Tokyo, Japan

8:40 am

30 Management of Pregnancy In Women With Previous Ilio-Caval Stenting

O. Hartung - CHU Nord, Marseille, France

9:00 am **31 The Evaluation of Diagnostic Procedures of Venous Thromboembolism (VTE) In Patients With Suspected VTE**
J. Lee, B. Zierler - University of Washington, Seattle, WA

9:20 am **32 The Quantitative Benefit of Isolated, Segmental, Pharmacomechanical Thrombolysis For Iliofemoral DVT**
J. Martinez, A. J. Comerota, S. Kazanjian, R. DiSalle, D. M. Sepanski, Z. I. Assi - The Toledo Hospital, Toledo, OH

9:40 am Coffee Break / Visit Exhibits

10:10 am **SCIENTIFIC SESSION VII: CHRONIC VENOUS DISEASE II**

Moderators: Joann Lohr, MD & Fedor Lurie, MD

Educational Objectives:

1. Upon completion of this session attendees will understand:

2. The implications of chronic venous disease and venous hypertension on the adverse effect on arterial hemodynamics.

3. The risk factors implicated in patients with varicose veins that will progress to venous ulceration.

4. The risk factors associated with recalcitrant venous ulcer treated with compression.

5. The technical application of a neovalve for deep venous insufficiency, comparing two different experiences.

10:10 am **33 Lower Extremity Arterial Inflow Is Adversely Affected In Patients With Postthrombotic Venous Disease**
D. Paolini, L. Jones, A. J. Comerota - The Toledo Hospital, Toledo, OH

10:30 am **34 Which Patients With Varicose Veins Are At Increased Risk of Chronic Leg Ulceration?**
L. Robertson¹, A. Lee², K. Gallagher³, S. Carmichael³, C. Evans⁴, B. McKinstry¹, S. Fraser³, P. Allan¹, C. Ruckley¹, F. Fowkes¹ - ¹University of Edinburgh, Edinburgh, United Kingdom, ²University of Aberdeen, Aberdeen, United Kingdom, ³Lothian University Hospitals NHS Trust, Edinburgh, United Kingdom, ⁴NHS Lothian, Edinburgh, United Kingdom

10:50 am **35 Risk Factors Related To the Failure of Venous Leg Ulcers To Heal With Compression Treatment**
D. J. Milic, S. S. Zivic, D. C. Bogdanovic, V. D. Milojkovic, M.A. Pejic, V. M. Popovic - Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia

11:00 am **36 Neovalve Construction In Deep Venous Incompetence: Comparison Between Two Subsequent Case Series and Related Technical Details**
M. Lugli, S. Guerzoni, O. Maletti - Hesperia Hospital, Modena, Italy

11:30 am **D. EUGENE STRANDNESS MEMORIAL LECTURE**
Introduced by: Mark H. Meissner, MD

12:30 – 1:30 pm

INDUSTRY SPONSORED LUNCHEON

ClosureFAST™ Clinical Trials Update

By: VNUS Medical Technologies

- 1) *Prospective, multicenter 1 year follow-up*
- 2) *Randomized trial comparing ClosureFAST to endovenous laser*
- 3) *Lessons learned 1 year post launch*

1:30 pm

ASK THE EXPERTS: PELVIC CONGESTION SYNDROME

Moderator: Chieh Min Fan, MD

Educational Objectives:

1. *Review anatomy and techniques for imaging the venous structures of the pelvis and retroperitoneum.*
2. *Recognize the clinical manifestations of pelvic venous congestion*
3. *Understand endovascular and surgical treatment approaches for pelvic venous congestion syndromes*
4. *Review classification, clinical patterns, and treatment approach for pelvic vascular anomalies*

Anatomy and Imaging of the Venous System of the Pelvis and Retroperitoneum

Chieh Min Fan, MD, Brigham and Women's Hospital, Boston, MA

Pelvic Congestion Syndrome: Diagnosis and Management

Anthony C. Venbrux, MD, George Washington U. Hospital, Washington, DC

Nutcracker Syndromes: Endovascular and Surgical Management

Matthew Menard, MD, Brigham and Women's Hospital, Boston, MA

Vascular Anomalies: An Uncommon Cause of Pelvic Venous Congestion

Patricia Burrows, MD, St. Lukes – Roosevelt Hospital Center, New York, NY

2:30 pm

Coffee Break / Visit Exhibits

HOW TO SESSION

Recanalization and Re-Endovenous Ablation; Mapping Out My Veins Tips and Tricks; Sclero the Do's and Don'ts

Moderator: Julianne Stoughton, MD

Educational Objectives:

- 1. Attendees will become familiar with many of the common, and some of the unusual (but important) patterns of venous anatomy*
- 2. There will be a discussion involving the approach to incompetent perforating veins; reviewing the treatment options, the technical aspects of each treatment, as well as a discussion of which veins are best treated with which technology*
- 3. Recanalization, neovascularization and recurrent veins after venous intervention and will be discussed. The approaches will be illustrated with case presentations*
- 4. Difficult management cases will be presented including: the hypercoagulable patient, the obese patient, patients with anomalous anatomy, etc.*

Endovenous Heat Induced Thrombosis: When To, How To and What To Look For

Lowell Kabnick, MD

Treatment of Incompetent Perforators

Steve Elias, MD

Treatment of Neovascularization and Recanalized Veins

Ronald Bush, MD

MODERATED POSTER SESSION

*Moderator: Michael Dalsing, MD
Frank Padberg, MD
Bo Eklof, MD*

Educational Objectives: The participants in the poster session will gain a wide range of knowledge expansion including chronic venous disorder, saphenous vein treatment, understanding risk factors and evaluation methods.

- P-1** **Microparticles: A Natural History Time Course Analysis In A Model of Murine Venous Thrombosis**
A. E. Hawley, D. M. Farris, N. E. Ballard, A. P. McDonald, S. K. Wroblewski, P. K. Henke, D. D. Myers, T. W. Wakefield - University of Michigan, Ann Arbor, MI
- P-2** **Popliteal Vein Compression Syndrome: Obesity, Venous Disease and the Popliteal Connection**
R. J. Lane¹, M. L. Cuzilla² - ¹Royal North Shore Hospital, Sydney, Australia ²Vascular Surgery Investigations and Management, Sydney, Australia
- P-3** **Ultrasonic Venous Valve Imaging - A Prerequisite For Exostent Repair**
R. J. Lane¹, M. N. Phillips², M. L. Cuzilla³ - ¹Royal North Shore Hospital, Sydney, Australia; ²AllVascular Pty Ltd, Sydney, Australia; ³Vascular Surgery Investigations and Management, Sydney, Australia
- P-4** **Prevalence and Distribution of Deep Vein Thrombosis In Patients With Symptomatic Pulmonary Embolism**
T. Yamaki¹, M. Nozaki¹, H. Sakurai¹, M. Takeuchi², K. Soejima³, T. Kono¹ - ¹Tokyo Women's Medical University, Tokyo, Japan; ²Nihon University, Tokyo, Japan; ³Tokyo Metropolitan Hiroo General Hospital, Tokyo, Japan
- P-5** **Endovenous Laser Therapy In the Treatment of Short Saphenous Varicose Veins: A Non-Randomised Controlled Trial**
A. Mekako, J. Hatfield, S. Gulati, M. Abdul Rahman, P. T. McCollum, I. C. Chetter - Hull Royal Infirmary/University of Hull, Hull, United Kingdom
- P-6** **Greater Saphenous Vein Diameter Predicts Venous Reflux**
J. Bloom, F. C. Vandy, S. Brown, A. Clay, C. Lane, G. Reynolds, S. LeBaron, C. Nighswander, P. K. Henke, T. W. Wakefield - University of Michigan, Ann Arbor, MI

- P-7** **Combined Intermittent Pneumatic Leg Compression and Pharmacological Prophylaxis For Prevention of Venous Thromboembolism In High Risk Patients**
S. K. Kakkos¹, J. A. Caprin², G. Geroulakos³, A. N. Nicolaidis³, G. P. Stansby⁴, D. J. Reddy¹ - ¹Henry Ford Hospital, Detroit, MI; ²Evanston Northwestern Healthcare, Evanston, IL; ³Imperial College, London, United Kingdom; ⁴University of Newcastle upon Tyne, Newcastle upon Tyne, United Kingdom
- P-8** **Evaluation of Venous Thromboembolism Prophylaxis In Randomly Selected Medical and Surgical Patients**
B. K. Zierler, J. Lee, G. Han, H. Oh, C. Jacobson - University of Washington, Seattle, WA
- P-9** **An Algorithm For Outpatient Deep Venous Thrombosis Management and Severe Post-Thrombotic Syndrome At Mid-Term Follow-Up**
E. Sivrikoz, M. Kurtoglu - Dept. of General Surgery, Istanbul School of Medicine, Istanbul University, Istanbul, Turkey
- P-10** **Prevalence of Isolated (C2) and Complicated (C2+) Varicose Veins Among Patients Consulting Vascular Specialists For Varicosis: A Snapshot**
M. Cazaubon¹, M. Lugli², P. Burseta³, M. Perrin⁴, F. A. Allaert, V⁵ - ¹American hospital, Neuilly, France; ²Vascular hospital, Bologna, Italy; ³vascular dept hospital, Modena, Italy; ⁴Vascular dept hospital, Lyon, France, ⁵cenbiotech ceren ESC and DIM CHRU Dijon, Dijon, France
- P-11** **Prospective Randomized Efficacy of Ultrasound-Guided Foam Sclerotherapy Compared To Ultrasound-Guided Liquid Sclerotherapy In The Treatment of Symptomatic Venous Malformations**
T. Yamaki¹, M. Nozaki¹, H. Sakurai¹, M. Takeuchi², K. Soejima³, T. Kono¹ - ¹Tokyo Women's Medical University, Tokyo, Japan; ²Nihon University, Tokyo, Japan; ³Tokyo Metropolitan Hiroo General Hospital, Tokyo, Japan
- P-12** **Elastic Stockings and Ulcer Treatment: What About Pressure and Stiffness?**
G. Mosti - Clinica MD Barbantini, Lucca (LU), Italy
- P-13** **Inelastic Compression Increases Venous Ejection Fraction More Than Elastic Bandages**
G. Mosti¹, H. Partsch², V. Mattaliano¹ - ¹Clinica MD Barbantini, Lucca (LU), Italy; ²Dermatology Department, Vienna, Austria
- P-14** **Arterial Revascularization and Compression Therapy In the Treatment of Mixed Arterial/Venous Leg Ulcers**
D. J. Milic, S. S. Zivic, Z. D. Perisic, R. Jankovic, G. Djordjevic, D.M. Stamenkovic, Z.D. Maksimovic Clinic for Vascular Surgery, Clinical Centre Nis, Serbia

- P-15** **Morphological Changes On Varicose Vein Wall Corresponds To MMP/TIMP Alterations**
B. Aravind¹, T. Navin², C. Monaco², E. Paleolog², A. H. Davies¹ - ¹Imperial College, Charing Cross Hospital, London, United Kingdom, ²Kennedy Institute of Rheumatology, Imperial College, London, United Kingdom
- P-16** **Lower Power Improves Clinical Outcome of the Endovenous Laser Treatment**
S. Kaspar, J. Siller, Z. Cervinkova - Flebocentrum, Hradec Kralove, Czech Republic
- P-17** **Effectiveness of Weight Loss On the Evolution of Chronic Venous Insufficiency (CVI) After Bariatric Surgery In Obese Patients**
J. Benigni¹, J. Uhp, J. Gobin³, A. Capella⁴ - ¹Hôpital BEGIN, St Mandé, France; ²Surgical Venous Center, Neuilly, France; ³Vascular medecine, Lyon, France; ⁴Angiologist, Paris, France
- P-18** **One Year Follow-Up of Radiofrequency Segmental Thermal Ablation (RTFA) of Great Saphenous Veins**
T. M. Proebstle¹, B. Vago², J. ALm³, O. Goeckeritz⁴, C. Lebard⁵, O. Pichot⁶ - ¹University of Mainz, Mainz, Germany; ²University of Heidelberg, Heidelberg, Germany; ³Dermatologikum, Hamburg, Germany; ⁴Venenzentrum am Elsterpark, Leipzig, Germany; ⁵Hospital St. Michel, Paris, France; ⁶CHU Service de Chirurgie Vasculaire, Grenoble, France
- P-19** **Elimination of Superficial Reflux With Or Without Subcutaneous Fasciotomy - The Impact On Deep Axial Reflux and ulcer Healing**
J. T. Christenson - Division of Cardiovascular Surgery, University Hospital of Geneva, Geneva, Switzerland
- P-20** **The Effectiveness and Use of Compression Stockings of Various Strength For the Treatment of Venous Disorders and Diseases: A Literature Survey**
W. Blaettler¹, H. E. Gerlach², F. Amsler³ - ¹Angio Bellaria, Zürich, Switzerland; ²Center for Vascular Diseases, Mannheim, Germany; ³Amsler Consulting, Biel-Benken, Switzerland
- P-21** **Management of Venous Injuries At the Air Force Theater Hospital In Balad, Iraq**
S. Gifford¹, W. T. Jones¹, M. A. Ricc², W. D. Clouse¹, T. E. Rasmussen¹ - ¹Wilford Hall Medical Center, San Antonio, TX; ²University of Vermont, Burlington, VT
- P-22** **Critical Issues In the Management of Venous Malformation (VM) Coexisting With Lymphatic Malformation (LM) - Klippel Trenaunay Syndrome (KTS)**
B. Lee, J. Laredo, D. Deaton, R. Neville - Georgetown University, Washington, DC

- P-23** **Variability of Interface Pressure Exerted By Compression Bandages and Standard Size Compression Stockings**
H. Partsch¹, W. Vanscheidt² - ¹Medical University Vienna, Vienna, Austria; ²University Clinic for Dermatology, Freiburg i.Br., Germany
- P-24** **Recanalization of Short Saphenous Vein After EVLT**
S. Shokoku - Varix Ambulatory Surgery Center, Okayama Daiichi Hospital, Okayama-shi, Japan
- P-25** **Endovenous Laser Ablation Compared With Stripping - Multi-Center RCT In Japan**
T. Ogawa¹, S. Hoshino¹, S. Makimura², H. Shigematsu², N. Azuma³, T. Sasajima³, H. Sugawara⁴, M. Ichiki⁴, S. Shokoku⁵ - ¹Fukushima Daiichi Hospital, Fukushima, Japan; ²Tokyo Medical University, Tokyo, Japan; ³Asahikawa Medical College, Asahikawa, Japan; ⁴JR Sendai Hospital, Sendai, Japan; ⁵Okayama Daiichi Hospital, Okayama, Japan
- P-26** **Pulse*Spray Sclerotherapy Study: A Pilot Study**
J. I. Almeida, J. K. Raines - Miami Vein Center, Miami, FL
- P-27** **Incompetent Perforators - What We Think We Know**
P. A. Hertzman - Vein Care of New Mexico, Los Alamos, NM
- P-28** **Non-Saphenous Approach To Varicose Veins With Foam Sclerotherapy**
V. Cheng - San Diego Vein Institute, Encinitas, CA
- P-29** **Case Report: Epithelioid Hemangioendothelioma of the Common Femoral Vein**
M. Lebow, A. Hurd, D. Cassada, M. Freeman, O. Grandas, S. Stevens, M. Goldman - University of Tennessee, Knoxville, TN
- P-30** **A Report of Two Rare Cases of Venous Aneurysms Involving the Lesser Saphenous Venous System**
S. Chen, A. N. Bowser, W. D. Clouse, C. Johnson, T. E. Rasmussen - Wilford Hall Medical Center Lackland AFB, San Antonio, TX
- P-31** **Multimodal Endovascular - Open Surgical Approach To Phlegmasia Cerulea Dolens of the Upper Extremity: A Case Report**
N. Patel, A. Puggioni, X. Li, A. Hingorani, A. Shiferson, V. Tran, E. Ascher - Maimonides Medical Center, Brooklyn, NY
- P-32** **Relation Between Number of Pregnancies and Great Saphenous Vein Diameters**
S. X. Salles-Cunha¹, N. Morrison² - ¹CompuDiagnostics, Inc, Phoenix, AZ; ²Morrison Vein Institute, Phoenix, AZ

7:30 pm

THE FORUM FINALE

Awards, Dinner, Entertainment & More

WEDNESDAY, FEBRUARY 20, 2008

7:00 am

Continental Breakfast

7:30 am

POSTGRADUATE COURSE

**IN THE ERA OF PAY FOR PERFORMANCE
OUTCOMES ASSESSMENT IN VENOUS
DISEASE: MEASUREMENT TOOLS AND RESULTS
REPORTING***Educational Objectives:**At the conclusion of the Postgraduate Course, the attendees will be able to:*

1. Identify outcome tools and measurements
2. Assess the results of treatment for venal caval filters, DVT, lymphedema and ulcer therapy
3. Assess compression devices and garments, clot extraction and superficial venous reflux

*Additionally, databases and information systems, non-invasive testing and ICAVL reporting standards, severity of illness assessment tools and quality of life measurements will be presented. The participant will also gain an understanding of the international training requirements and recommendations for the non-vascular specialist.***Session I****Introduction***Joann Lohr, MD***Vena Caval Filters: Fact or Fiction***David L. Gillespie, MD***Deep Venous Reconstruction: Stents and Valves***Peter Neglen, MD***Lymphedema and Ulcer Therapy: Compressions
Devices and Garments***Joseph Raffetto, MD***Noninvasive Testing and ICAVL Reporting Standards***Eugene R. Zierler, MD***Vascular Training Requirements and
Recommendations For Nonvascular Specialists***Bo Eklof, MD*

Question and Answers & Discussion

9:30 - 10:00 am

Coffee Break

Session II

Severity of Illness Assessment Tools and Quality of Life

Michael Vasquez, MD

Thrombolysis – Who, What, When, Where, How For Clot Removal

Anthony Comerota, MD

Superficial Venous Reflux, Compression, and Nonoperative Therapy

Marc A. Passman, MD

Superficial Venous Reflux Interventional Options

Nick Morrison, MD

Databases and Information Systems

Brenda K. Zierler, PhD

Question and Answer

Conclusion

12:00pm

Lunch (Boxed Lunch To Be Provided)

12:00 pm

ASK THE EXPERTS: DEEP ENDOVENOUS PROCEDURES

Moderator: Peter Neglen, MD

Educational Objectives:

- 1. To be aware of technical aspects of venous stenting*
- 2. To realize its role in chronic venous disease*
- 3. To recognize its adjuvant role in early clot removal*

*Panelists: Haraldur Bjarnason, MD
David Gillespie, MD
Anthony Gasparis, MD*

3:00 pm

Coffee Break

SCIENTIFIC SESSION I: Endovenous

Moderators: *Mark Meissner, MD*

Lowell Kabnick, MD

Educational Objectives:

- 1. Upon completion of this session attendees will understand:*
- 2. An in depth analysis of endovenous ablative therapies comparing costs with open procedures.*
- 3. Evaluating quality of life and disease severity outcomes when treating the superficial system with concomitant deep system reflux.*
- 4. The safety of endovenous ablative procedures in patients that have or have had deep venous thrombosis.*
- 5. Deciding if there is a benefit in performing immediate or staged adjunctive phlebectomy with endovenous ablation.*
- 6. The importance of inflammatory markers in venous ulcer, and the affect of compression therapy on changes in cytokines levels and healing.*
- 7. The importance of foam sclerotherapy in treating unusual varices of the sciatic nerve utilizing Duplex ultrasound guidance.*

1. Radiofrequency Ablation Versus Conventional Surgery For Varicose Veins - A Comparison of Costs

S. Subramonia¹, T. Lees² - ¹Queen's Medical Centre, Nottingham, United Kingdom, ²Freeman Hospital, Newcastle upon Tyne, United Kingdom

Background: To compare the costs involved (from procedure to recovery) following radiofrequency ablation and conventional surgery for isolated long saphenous vein incompetence in a selected population through a single-centre prospective randomised controlled trial.

Methods: Patients suitable for ablation (CEAP class 2-6) were selected by clinical assessment and duplex ultrasonography and randomised to either ablation or surgery and followed up one week and five weeks after surgery. Duplex ultrasonography was performed at first follow up. The primary outcome was the time (days) to return to full level of normal household activities. The hospital, practice and patient costs were calculated to indicate mean cost per patient under each category. Any difference in productivity between the two treatments in the employed group, due to sickness leave after surgery, was expressed as cost per working hour gained. The difference in productive unpaid household work after surgery between the two groups was expressed as cost per hour of household work gained.

Results: 93 patients were randomised. 88 patients (47-ablation, 41-surgery) underwent the chosen intervention (five not treated). There was no follow up loss. Ablation took longer to perform than surgery (mean 76.8 vs 47.0 minutes, $p < 0.001$, t-test). Patients returned to their normal activities (mean 5.87 vs 13.8 days, $p < 0.001$, t-test) and to work (mean 12.2 vs 19.8 days, $p = 0.006$, t-test) significantly quicker following ablation than after surgery. Ablation was more expensive (£1275.90 vs £559.13 per patient) but produced a mean gain of one working week in the employed group compared to surgery. Based on 2005 Annual Survey of Hours and Earnings data (Office of National Statistics, UK) for full time employees, the cost per working hour gained was £6.94 (95% confidence interval 6.26, 7.62). Of those in the trial who were unemployed (20 patients) patients who underwent ablation returned to the normal household activities 17 days quicker than those who underwent surgery. Based on October 2000 Household Satellite Account data for household activities (Office of National Statistics, UK), the cost per hour of household work gained was £5.60 (95% confidence interval 5.21, 5.99).

Conclusions: The increased cost of radiofrequency ablation is partly offset by a quicker return to work in the employed group. Reduced equipment costs and faster ablation with the new 'segmental ablation' catheter is likely to reduce the cost difference in future. Ablation is unlikely to be a cheaper option in the unemployed at reference year (2005) estimates.

£ = UK pound sterling

2. Endovenous Laser Ablation Improves Venous Outcomes Irrespective of the Presence of Deep Venous Insufficiency

B. S. Knipp, F. Mansoor, M. Hong, J. Bloom, E. Fellows, S. Blackburn, G. Adams, J. Pfeifer, D. Williams, T. Wakefield - University of Michigan, Ann Arbor, MI

Background: We hypothesize that endovenous laser ablation therapy (EVLT) is equally successful in improving venous insufficiency in patients with or without deep venous insufficiency (DVI).

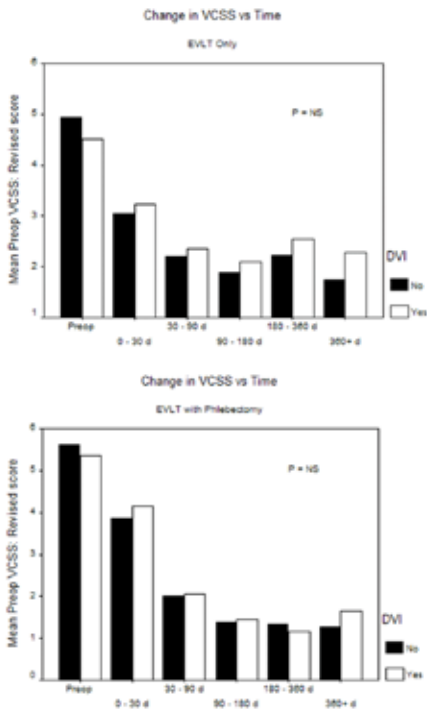
Methods: From January 2005 through August 2007, EVLT was attempted in 386 patients and 493 limbs. It was performed successfully in all but 17 cases. EVLT was performed alone in 334 limbs (70.2%) and with phlebectomy and/or perforator ligation (EVLTP) in 142 limbs (29.8%). In a subset of patients undergoing EVLTP, perioperative thrombosis prophylaxis was administered based on a risk stratification protocol.

Results: Successful performance of EVLT led to complete saphenous vein ablation in 100% at one month and 90.3% at 1 year. Performance of EVLTP was associated with improved occlusion duration ($P=.019$). Mean revised VCSS (VCSS minus compression) preoperatively was 5.0 ± 2.9 , decreasing to 1.7 ± 1.5 beyond 360 days ($P < 0.001$). Male gender ($P=0.025$) and performance of phlebectomy ($P=0.020$) were independently associated with greater improvement in scores with time. Changes in VCSS scores were equivalent regardless of DVI for both isolated EVLT and EVLTP (Figures).

In cases of isolated EVLT, the true DVT rate was 0.6%, whereas for EVLTP, the rate was 2.8% ($P=0.068$); the rate of thrombus extension at the SFJ was 7.5% for isolated EVLT versus 2.8% for EVLTP ($P=0.059$). The use of risk-adjusted heparin prophylaxis in patients undergoing EVLTP did not have a significant effect on thrombotic complications. There were no differences in true DVT, thrombus extension, or superficial thrombophlebitis between patients with or without DVI (Table).

Using a multivariate regression model, obstructive pathophysiology was predictive of technical failure (OR 15.3, CI 2.3 to 100.1, $P=0.004$). Using a Cox proportional hazards model, performance of phlebectomy was independently predictive of duration of vessel occlusion (OR 8.3, CI 1.0 to 66.7, $P=0.047$).

Conclusions: EVLT produces successful ablation and is associated with significant long-term improvement in VCSS. While there is a trend towards increased deep venous thrombosis when performing concomitant phlebectomy, there is also a significant improvement in long-term outcomes and VCSS scores, independent of DVI. Finally, the use of a risk-adjusted thrombosis prevention protocol had no effect on the rate of thrombotic complications from EVLTP.



Thrombotic Complications				
	EVLT	EVLIP		
	DVI	No DVI	DVI	No DVI
True DVT	2 (0.9%)	0 (0%)	4 (4.0%)	0 (0%)
Thrombus Extension	17 (7.4%)	7 (7.6%)	4 (4.0%)	0 (0%)
Thrombophlebitis	4 (1.7%)	1 (1.1%)	4 (4.0%)	2 (5.0%)

3. Radiofrequency Ablation of the Great Saphenous Vein In Patients With Previous Venous Thrombosis: Is It Safe?

A. Puggioni, N. Marks, A. Hingorani, A. Shiferson, E. Ascher
- Maimonides Medical Center, Brooklyn, NY

Background: The safety of radiofrequency ablation (RFA) of the great saphenous vein in patients with previous history of deep venous thrombosis (DVT) has not yet been determined.

Methods: From April 2003 to June 2006 we performed 293 consecutive RFA procedures in 274 patients (68% females) with a mean age of 60 ± 15 years. Patients with a history of previous venous thromboembolic events or with duplex scan evidence of post-thrombotic venous disease were identified in 29 of these cases (10%). These were compared to the remaining 264 cases (90%) without history or duplex evidence of thrombotic disease. Routine postoperative duplex scanning was obtained in all cases. Acute thrombotic (AT) events that developed in either lower extremity were documented and analyzed. According to the CEAP classification, 204 limbs (70%) were C2-C4, and 89 (30%) were C5-C6. Concomitant procedures included avulsion phlebectomy in 88 limbs (30%) and perforator surgery in 4 (1%).

Results: AT events after RFA were detected in 38 cases (13%) and included thrombus protrusion into the SFJ in 24 (8%), common femoral vein in 7 (2%) and calf vein DVT in 7 (2%). Overall incidence of AT in patients with and without evidence of previous DVT was 7% (2/29) and 14% (36/264), respectively ($p=0.36$). Advanced clinical presentation by CEAP classification(classes C5-C6) was not significantly different between the AT (15/38=39%) and non-AT (74/255= 29%) groups ($p=0.19$). Conversely, concomitant venous operations were associated with a significant increase in AT events (20/88= 23% versus 18/205=9%) with a $p<0.002$. All AT patients were successfully treated with standard anticoagulation. No cases of pulmonary embolism occurred in this series.

Conclusions: This experience shows that RFA of the great saphenous vein in patients with previous venous thromboembolic events is safe and should be offered as an alternative to surgical procedures. These data call attention to an increased incidence of AT events when concomitant venous operations are performed.

4. Mid-Term Results of the Surgical Treatment of Varices By Phlebectomy With Conservation of A Refluxing Saphenous Vein

P. Pittaluga¹, S. Chastanet¹, J. J. Guex² - ¹Riviera Veine Institut, Nice, France; ²Cabinet de Medecine Vasculaire, Nice, France

Background: A new physiopathological concept within superficial venous insufficiency (SVI) describes ascending progression from the collaterals to the saphenous veins (SV), leading to a treatment that aims to remove the varicose reservoir (VR) and not the SV. This study reports the mid-term results of this therapeutic approach.

Methods: This is a retrospective study of patients treated for varices by phlebectomy with conservation of the SV before July 2004. We evaluated the VR by determining the number of zones treated (NZT); each lower limb (LL) was divided into 32 zones. We performed a clinical examination and echo-Doppler after 6 months and 1 year, and then once a year until the 4th year. We monitored the progression of the saphenous reflux, as well as the signs and symptoms. We looked for risk factors (RF) for the persistence of SV reflux, an absence of clinical improvement, and postoperative varices recurrence.

Results: We operated on a total of 303 LL involving 221 patients (55 men and 166 women), with a mean age of 52.7 (20 to 93). All LL operated on presented preoperative SV reflux over 0.5 s: great saphenous vein (GSV) 85.8%; small saphenous vein (SSV) 11.9%; and GSV+SSV 2.3%. The NZT was 6.05 on average (2 to 10).

Saphenous reflux was abolished in 67.8%, 68.1%, 66.3%, 67.2% and 67.7% of cases respectively after 6 months, 1, 2, 3 and 4 years of follow-up. Symptoms improved or disappeared in 84.4%, 82.3%, 83.9% and 89.2% of cases, and cosmetic benefits were noted in 91.9%, 91.1%, 90.7% and 91.9% of cases at each annual check-up until the 4th year. The recurrence rate at 1, 2, 3 and 4 years was respectively 1.2%, 5.9%, 10.9% and 19.4%.

RF for SV reflux persistence were the preoperative existence of SV reflux reaching the malleolus and an NZT > 7.

Conclusions: Ablation of the VR with conservation of a refluxing SV is an effective treatment in the mid-term for the signs and symptoms of SVI, and leads to the abolition of SV reflux in over 2 out of 3 cases. The extent of the VR ablation is the key factor determining the hemodynamic and clinical efficacy of this conservative surgical approach.

5. Endovenous Laser Therapy With Concomitant Or Sequential Phlebectomy: A Randomized Controlled Trial

A. I. Mekako, J. Hatfield, M. N. Abdul Rahman, S. Gulati, P. T. McCollum, I. C. Chetter - Hull Royal Infirmary/University of Hull, Hull, United Kingdom

Background: Significant proportions of patients require secondary procedures such as sclerotherapy or phlebectomy following endovenous laser ablation of varicose veins. We compared endovenous laser therapy and concomitant phlebectomy (EVLTA) with endovenous laser therapy (EVL) only.

Methods: Patients undergoing EVL were randomised to undergo concomitant phlebectomy (n=18), or no phlebectomy (n=18), and followed up at 1, 6, and 12 weeks post-procedure. Procedure duration, pain scores, return to work /normal activities, patient satisfaction, quality of life (QoL) outcomes, venous clinical severity scores (VCSS), and need for secondary intervention were compared. Results are expressed as median (inter-quartile range); p value.

Results: Duration of EVLTA procedure was significantly longer than EVL only: 67 (51-78) minutes versus 46 (38-56) minutes; p=0.003. There were no differences between groups in pain scores, time to work /normal activities, and patient satisfaction. EVLTA patients had significantly lower Aberdeen Varicose Vein Scores at 6 weeks [7.12 (2.00-11.56) versus 14.74 (10.54-18.07); p=0.001] and 12 weeks [2.06 (0.00-6.71) versus 9.60 (7.08-13.39); p=0.009]. There were no significant differences between groups in any SF-36 domain at any time point. VCSS was significantly better in the EVLTA group at 12 weeks. 6 patients (35%) in the EVL only group required sequential phlebectomy, while no patient in the EVLTA group required secondary procedures.

Conclusions: EVLTA results in significantly better clinical improvement and disease-specific QoL outcomes than EVL only, in the short-term. Although the procedure duration is longer, it neither increases pain nor delays return to work, and it obviates the short-term need for secondary procedures.

MINI PRESENTATIONS

5:10 pm

6. (Mini Presentation 1) Foam Sclerotherapy of Venous Malformations *V. Cheng – San Diego Vein Institute, Encinitas, CA*

Background: Venous malformations are common and may occur either as localized or segmental lesions. They account for up to 80% of lesions in malformation clinics. They enlarge when dependent and with exercise. Skin temperature is usually normal and pain is variable but fairly common. Pathologically, the lesions are made up of anomalous dilated veins with irregularly thickened walls. Sometimes, interconnected channels penetrate normal tissues.

Radiologic imaging defines the extent of involvement of venous malformations, but 3D-MR venography is the best single imaging modality. It gives a bright hyper signal on T2-weighted spin-echo sequences and allows 3-D reconstruction. Because the lesions are usually low flow, Doppler ultrasound is useful as a preliminary imaging study and to monitor treatment.

The management of venous malformations will depend on the patient's age, cosmetic severity, and location of the abnormality.

Methods: During a 30 month period, 1427 patients were investigated at our institution for venous disorders and 1.2% (17 patients) were found to have venous malformations. The age range was from 15 to 76 years (mean 30.8 ± 18.6). Nine patients had manifestations of lower extremity Klippel-Trenaunay (K-T) syndrome; seven had only venous malformations.

Foam polidocanol (2 or 3% concentration) was produced by the Tessari technique and duplex doppler was used for ultrasound guidance and to monitor effects of treatment.

Results: A goal was set for each patient. The mean number of treatments was 3.6 ± 2.8 (range 1-10). Pain free healing was achieved in patients with non-healing ulcerations and, cosmetically, all of the patients were improved. There was no need for anesthesia, analgesia, or hospital stay. No patient had a deep venous thrombosis.

Conclusions: Sclerosant foam is useful in treating low flow venous malformations. It is quick, painless, and effective while not requiring anesthesia or hospitalization.

7. (Mini Presentation 2) The Echo-Guided Sclerotherapy In Sciatic Nerve Varices Treatment

S. Giancesini, G. Tacconi, A. Palazzo, P. Fortini, E. Righi, E. Menegatti, A. Liboni, P. Zamboni - Ferrara University, Ferrara, Italy

Background: Sciatic veins are tiny deep venous plexuses that remain following embryologic involution of the primordial venous vessels, developing in the embryo alongside the nerves. These veins can be found dilated at the duplex scanning whenever a collateral venous drainage is required following a deep vein thrombosis or whenever we observe an angio-dysplastic disease afflicting the same vessels, and are defined sciatic nerve varices (SNV).

SNV are a possible cause of sciatic pain and they have to be considered in the differential diagnosis whenever the physical examination reveals the co-existence of varicose veins of the postero-lateral aspect of the leg.

Anatomically the SNV lay within the sciatic nerve and are composed of multiple channels spiraling around the same nerve. This data suggests not to proceed with a surgical approach in the treatment of these disease because of the obvious great risk of damaging the nerve structures.

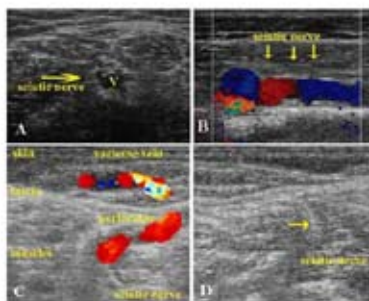
An alternative approach that we have considered in our study is the echo-guided sclerotherapy.

The aims of this study is to verify both safety and effectiveness of ultrasonic guided foam sclero-therapy in treating SNV.

Methods: 19 consecutive patients, affected by symptomatic and angiodysplastic SNV, underwent both clinical and color Doppler investigation. All of them have been treated by one-shot echo-guided Tessari-foam sclero-therapy with just 2 of them who needed a second treatment always by the same technique. It has been possible to determine a follow-up for 12 of the 19 patients, that has included clinical as well as ultra-sonographic evaluation. Clinical results were assessed by objective and subjective Hobbs Scale. Objective evaluation was made by an independent assessor, who wasn't previously involved in the treatment. In addition duplex investigation was repeated. Subjective assessment was made by the patients at their own control.

Results: The mean follow-up lasted 24 months. Excluding skin pigmentation in 2 patients or a mild hardening feeling along the treated region in 3 other patients, nor minor nor major complications have emerged and the patients' compliance has been optimal. Reflux through the SNV, as the connected varicose veins, disappeared in the entire cohort. Mean subjective Hobbs Scale was A. Coexisting sciatic pain disappeared.

Conclusions: Ultrasonic foam sclero-therapy, in the mid term, seems to be both safe and effective, so representing a reliable and minimally invasive treatment of SNV.



A-B: Transversal (A) and longitudinal (B) high resolution B mode imaging of SNV.

C: Varices of the lateral aspect of the leg fed by reflux through a perforating vein by SNV.

D: The echo coming from the foam reaching its target in an area not so easily reachable by surgery.

6:00 pm

Welcome Reception

THURSDAY, FEBRUARY 21, 2008

7:00 am Continental Breakfast / Exhibits Open

8:00 am

SCIENTIFIC SESSION II: Basic

Moderators: Joseph Raffetto, MD & David L. Gillespie, MD

Educational Objectives:

1. Upon completion of this session attendees will gain knowledge in:
2. The importance of microparticles in the formation of venous thrombosis.
3. The influence of matrix metalloproteinases (MMPs) in the venous ulcer wound environment, and how the composition of MMPs may affect venous ulcer wound healing.
4. The importance of physiologic age on thrombus formation and resolution.
5. How MMPs affect venous relaxation by altering the calcium entry into smooth muscle.
6. Important novel hemodynamic measurements in defining chronic venous disease.
7. Neovascularization and a novel treatment algorithm.
8. Determining if cryo-venous stripping has any advantages over traditional stripping of the great saphenous vein.

8:00 am

8. Microparticles Surface Proteins Influence Venous Thrombogenesis

N. M. Abdullah, M. Kachman, A. Walker, A. E. Hawley, S. K. Wroblewski, D. D. Myers, Jr., J. R. Strahler, P. C. Andrews, P. K. Henke, T. W. Wakefield - University of Michigan, Ann Arbor, MI

Background: Microparticles (MPs) are small membrane vesicles released from a variety of cells upon activation. Elevated levels of MPs have been associated with many pathological conditions, including thrombosis and inflammation. MPs contain a unique subset of surface proteins derived from parent cell and may be responsible for their diverse biological functions. We used a quantitative proteomic approach to characterize the proteins which become amplified on the MP surface during venous thrombosis in an animal model.

Methods: Juvenile baboons (n4) underwent iliac vein thrombosis with temporary six-hour balloon occlusion as previously described. Plasma samples were taken at baseline and at 2 days post thrombosis for MPs analysis. MPs were extracted from platelet-poor plasma, digested separately with trypsin and tagged using isobaric tag for relative and absolute quantification (iTRAQ) reagents. The digests were subjected to 2-dimensional liquid chromatographic separation followed by MALDI tandem mass spectrometry. Peak lists were generated and searched against all primate sequences using Mascot search engine. For protein identity, a minimum of two peptides at 95% confidence was required. Later, iTRAQ ratios were generated comparing relative protein level of day 2 to baseline.

The proteomic analysis was performed twice for each blood sample, totaling to 8 experiments. Twenty-two proteins were considered to be on the surface of microparticles as determined by their consistent appearance in at least 4 out of 8 experiments. Data were normalized based on proteins (n8) that did not change their iTRAQ ratios at 2 days post thrombosis. Proteins were considered elevated or depressed if the iTRAQ ratio deviated by 20% change from normal value (1).

Results: Six proteins were statistically elevated with 1 protein being significantly depressed on day 2 versus baseline (Table 1). 15 proteins were present with no statistical elevation.

Conclusions: In this study we defined a diverse component of proteins that were associated with circulating microparticles in our animal model of venous thrombosis. These proteins influence thrombosis and inflammation through hemostatic plug formation (fibrinogen), stabilizing PAI-1 (vitronectin), inhibiting fibrinolysis (serpin peptidase inhibitor), stimulating antioxidant activity (haptoglobin), and immunoregulation (Mamu IgM). Proteins not statistically elevated may play an important role during acute thrombosis as well. Proteomic data from this and future studies can be used to identify novel biomarkers to target future therapies for venous thrombosis. This study is the first to demonstrate the proteome of microparticles in a large animal model of venous thrombosis.

Protein Name	Average iTRAQ ratio	p-value
Fibrinogen gamma chain (elevated)	1.915	p<0.01
Fibrinogen beta chain isoform 4 (elevated)	2.001	p<0.01
Serpin peptidase inhibitor (elevated)	3.318	p<0.01
Vitronectin (elevated)	1.267	p<0.01
Haptoglobin (elevated)	1.880	p<0.05
Trypsin precursor (elevated)	2.043	p<0.05
Mamu IgM-rh heavy chain (depressed)	0.750	p<0.01

9. Inflammatory Cytokine Levels In Chronic Venous Insufficiency Ulcers Before and After Compression Therapy

*S. Beidler, C. Douillet, D. Berndt, P. Rich, W. Marston -
University of North Carolina at Chapel Hill, Chapel Hill, NC*

Introduction: Patients with ulceration related to chronic venous insufficiency (CVI) have been reported to express high levels of pro-inflammatory cytokines from ulcer tissue. It is theorized that control of the inflammatory process is required for expeditious ulcer healing. In this study we evaluated the expression of pro-inflammatory cytokines and the multi-factorial cytokine TGF- β 1 in healthy and ulcer tissue before and after 4 weeks of high strength multilayered compression bandage therapy.

Methods: Tissue biopsies were obtained from ulcers in 30 patients with duplex confirmed venous insufficiency before and after four weeks of sustained high compression therapy. Healthy biopsies were taken from the ipsilateral thigh in 23 of the 30 patients. The tissue was homogenized and IL-1 α , IL-1 β , IL-6, IL-8, MCP-1, IFN- γ , MIP-1 α , MIP-1 β and TNF- α protein levels were obtained using a Luminex xMAP multiplexed assay which simultaneously measured cytokines in individual samples. TGF- β 1 levels were assessed by ELISA (N=10). All cytokines were normalized to total protein levels. Results were analyzed using ANOVAs, and data are presented as means and standard errors of the means.

Results: The average wound size decreased by 52% after 4 weeks of compression. Compared to healthy tissue, all pro-inflammatory cytokines, except IL-1 α , were significantly elevated in CVI ulcers before therapy. IL-6, MCP-1 and IFN- γ were elevated in the ulcer following therapy compared to healthy tissue (See Table 1). Compression therapy significantly decreased IL-1 β , IL-6, IL-8, IFN- γ and TNF- α ulcer tissue levels. IL-1 α healthy tissue samples were elevated compared to ulcer tissue. TGF β -1 ulcer tissue levels were significantly elevated compared to healthy tissue and continued to rise with compression therapy.

Conclusions: The majority of pro-inflammatory cytokines were significantly elevated in CVI ulcers when compared to healthy tissue using a multiplexed assay technique. Although all cytokines were identified in the ulcer tissue, disproportionately high levels of IL-8 were observed. Four weeks of compression therapy decreased the ulcer pro-inflammatory cytokine milieu and significantly increased TGF β -1 levels. The results indicate that the beneficial effect of compression therapy is mediated by a reduction of inflammatory mediators combined with an increased presence of TGF β -1.

Table 1. Pro-Inflammatory Cytokine and TGF-β1 Protein Levels in Chronic Venous Insufficiency Ulcers Before and After 4 weeks of Compression Therapy.

Healthy Tissue			
(pg/ug protein)	Ulcer Before Therapy		
(pg/ug protein)	Ulcer After Therapy		
(pg/ug protein)			
IL-1α *^	2.639 + 0.637	0.88 + 0.313	0.29 + 0.043
IL-1β *#	0	0.163 + 0.051	0.023 + 0.01
IL-6 *^#	0	1.273 + 0.309	0.623 + 0.146
IL-8 *#	0.013 + 0.007	15.19 + 4	3.8 + 0.874
MCP-1 *^	0.108 + 0.038	1.028 + 0.1	0.937 + 0.106
IFN-γ *^#	0.010 + 0.004	0.275 + 0.049	0.139 + 0.029
TNF-α *#	0.003 + 0.001	0.019 + 0.005	0.010 + 0.001
MIP-1α *	0.048 + 0.014	0.542 + 0.186	0.244 + 0.028
MIP-1β *	0.113 + 0.013	0.316 + 0.092	0.191 + 0.019
TGF-β1 *^#	0.085 + 0.011	0.243 + 0.023	0.336 + 0.039

p < 0.05:

* Healthy Tissue vs. Ulcer Before Therapy

^ Healthy Tissue vs. Ulcer After Therapy

Ulcer Before Therapy vs. Ulcer After Therapy

10. The Matrix Metalloproteinase (MMP) Profile In the Venous Ulcer Bed May Provide A Prognostic Indication of Ulcer Healing

J. Tan, A. Smith, K. Burnand - Academic department of Surgery, Cardiovascular Division, London, United Kingdom

Background: Chronic venous ulcers are characterised by an imbalance in extracellular proteolytic activity causing abnormal collagen turnover. The aim of the study was to examine the activity of matrix metalloproteinases (MMPs) and their inhibitor TIMP1 (which are important regulators of extracellular matrix turnover) in chronic venous ulcer biopsies. The inhibitory effect of treatment with doxycycline on MMPs was also investigated.

Methods: Punch biopsies were taken from the ulcer margins of 55 patients with chronic venous ulceration of at least 6 months duration. Patients were randomised to receive doxycycline (200mg once a day orally) or placebo for 3 months. All patients were treated with 3-layer compression bandages and were followed up for a minimum of 12 months. A further punch biopsy was performed if the ulcer failed to heal. The activity and protein levels of MMP-1, -2, -3, -8, -9 and TIMP-1 were measured by bioimmunoassay and ELISA respectively.

Results: Thirty one patients achieved complete healing by 3 months. Significantly higher activities of MMP-2 ($P=0.0008$) and MMP-8 ($P=0.0004$) were found in those patients whose ulcer had failed to heal. Slow healers demonstrated a reduction in MMP-3 activity ($P=0.028$). There was no difference in the total protein levels in all the MMPs studied between the two groups. Significantly higher levels of TIMP-1 ($P=0.001$) were found in the slow healers. Doxycycline suppressed the activity of MMP-1, -8 and -9 ($P=0.025, 0.027$ and 0.037 respectively). The administration of doxycycline did not appear to influence the leg ulcer healing rate.

Conclusions: There is a complex temporal pattern in MMP expression during ulcer healing, but it appears that increased MMP-2 and MMP-8 activities may inhibit ulcer healing. Selective pharmacological inhibition of these MMPs may be beneficial.

11. The Prothrombotic Effects of Aging On Acute Venous Thrombosis In A Rodent Model

A. P. McDonald, T. R. Meier, A. E. Hawley, J. N. Thibert, D. M. Farris, S. K. Wroblewski, P. K. Henke, T. W. Wakefield, D. D. Myers, Jr. - University of Michigan, Ann Arbor, MI

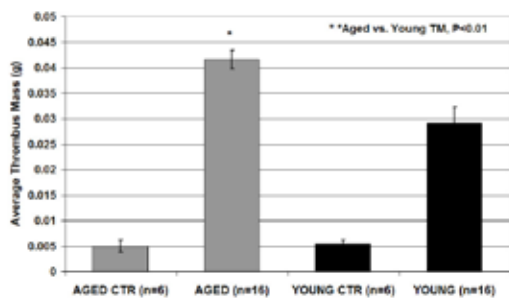
Background: Deep venous thrombosis (DVT) is recognized as a national health care concern. Recent studies have shown that the incidence of venous thrombosis significantly increases in the elderly. The risk of thrombosis increases by 1000 fold when the very old are compared to younger individuals. This current study identifies several age-related factors that may account for this increased risk.

Methods: Anesthetized male mice (C57BL/6, n=44) underwent complete inferior vena cava occlusion to produce venous thrombosis. Experimental groups included young mice (2 mo) vs. aged mice (11 mo), and aged match control animals from the same background. Mice were euthanized two days post-thrombosis for tissue harvest and blood collection. The following parameters were assessed: thrombus mass (g/cm), vein wall inflammatory cell populations (cells per 5 high powered fields), vein wall protein levels by multiplex ELISA (pg/ml), plasma PAI-1 activity (ng/mg), and circulating plasma microparticles (MPs, per 200 μ l of platelet-poor plasma).

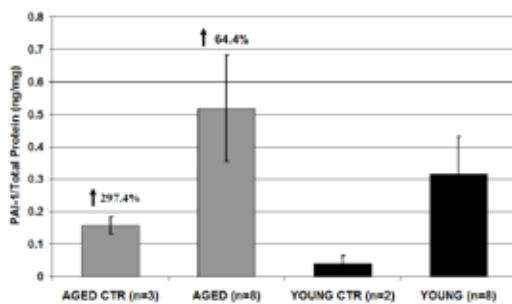
Results: Two days post thrombosis, aged mice had significantly larger thrombi than younger mice (Figure 1). Vein wall monocyte, lymphocyte, and total inflammatory cell populations were all significantly lower in aged mice ($P < 0.05$). Vein wall protein analysis showed significant elevations in P-selectin at day 2 in aged mice, and significant declines in interleukin 4 (IL-4) and eotaxin protein levels versus young mice at the same time point ($P < 0.05$). Aged control (CTR) mice had a 297.4% increase in PAI-1 activity compared to younger CTR animals. Two days post thrombosis, aged mice showed a 64.4% increase in PAI-1 activity compared to younger animals (Figure 2). The evaluation of mouse plasma showed aged mice to have a significant increase in circulating leukocyte-derived MPs compared to younger animals (5817 ± 850 vs. 2563 ± 283 MPs/200 μ l PPP, $P < 0.01$).

Conclusions: In our rodent model, aging significantly increased venous thrombosis. Aging significantly decreased vein wall inflammatory cell populations needed for thrombus resolution. Plasma PAI-1 activity increased with age suggesting PAI-1-dependent fibrinolysis is impaired in older mice. Both vein wall eotaxin and IL-4 protein levels, which influence fibroblast and endothelial cells, were significantly decreased with age. Aging significantly increased leukocyte-derived microparticle populations and procoagulant P-selectin activity that are known to promote venous thrombosis. This study shows that aging alters the balance of several pro-thrombotic and fibrinolytic factors to favor venous thrombosis.

Thrombus Mass



Plasma PAI-1 Activity



12. **MMP-2 Induced Venous Relaxation Via Inhibition of Ca²⁺ Entry-Dependent Mechanisms of Venous Smooth Muscle Contraction**

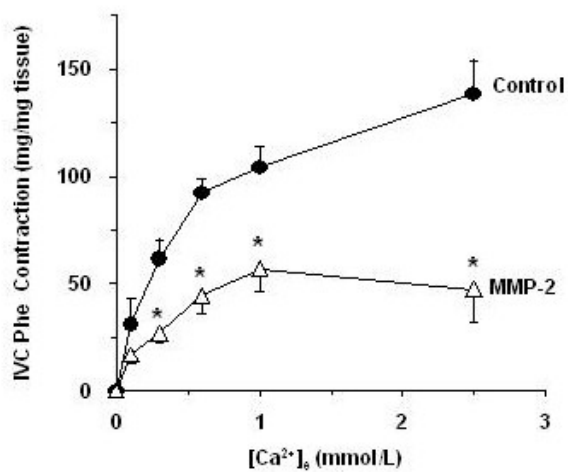
J. D. Raffetto¹, R. Khalil² - ¹VA Boston Healthcare System, West Roxbury, MA, ²Brigham and Women's Hospital, Boston, MA

Background: Matrix metalloproteinases (MMPs) are implicated in the pathogenesis of varicose veins (VarV). We have shown that MMP-2 causes relaxation of venous segments and suggested a role of venous smooth muscle (VSM) hyperpolarization and activation of K⁺ channels; however, the downstream mechanisms involved are unclear. We tested whether MMP-2 induced venous relaxation involves inhibition of the Ca²⁺ mobilization mechanisms of VSM contraction.

Methods: Circular segments of rat inferior vena cava (IVC) were suspended between two wires in a tissue bath, and isometric contraction was measured. To test the role of Ca²⁺ release from the sarcoplasmic reticulum, IVC was incubated in Ca²⁺-free (2 mM EGTA) Krebs with or without MMP-2 (1 µg/mL), then stimulated with phenylephrine (Phe, 10⁻⁵ M), caffeine (25 mM) or angiotensin II (AngII, 10⁻⁵ M). To test the role of Ca²⁺ entry through Ca²⁺ channels, after eliciting a transient Phe contraction in 0 Ca²⁺ Krebs, increasing concentrations of CaCl₂ (0.1, 0.3, 0.6, 1, 2.5 mM) were added and the [Ca²⁺]_i-contraction relation was constructed. Contraction data were presented as means±SEM mg/mg tissue.

Results: In IVC incubated in normal Krebs (2.5 mM Ca²⁺), Phe caused an initial peak (133±18) and a maintained contraction (73±12), while AngII caused a monophasic contraction (123±13). In Ca²⁺-free Krebs, caffeine did not cause contraction, suggesting limited role of the Ca²⁺-induced Ca²⁺-release mechanism in IVC contraction. Also, in Ca²⁺ free Krebs, Phe and AngII caused a small contraction (7±2 and 15±3) that was not significantly affected by MMP-2 (10±3 and 73±27), suggesting little effect on IP₃-induced Ca²⁺ release. The [Ca²⁺]_i-contraction relation was reduced in MMP-2 treated IVC (figure), suggesting inhibition of Ca²⁺ entry. The specificity of the inhibitory effect of MMP-2 was demonstrated by its reversal with TIMP-1. In IVC treated with MMP-2, the Ca²⁺ channel blocker diltiazem (10 µM) did not cause any further inhibition of Phe contraction, suggesting that Ca²⁺ entry is already inhibited by MMP-2.

Conclusion: In rat IVC, MMP-2 attenuates Ca²⁺ entry through Ca²⁺ channels, without affecting IP₃-induced Ca²⁺ release from intracellular Ca²⁺ stores. MMP-2 role in venous dilation and varicose vein formation may involve inhibition of the Ca²⁺ entry mechanism of VSM contraction.



MINI PRESENTATIONS

9:40 am

13 (Mini Presentation 3)

Doppler Derived Maximum Venous Outflow Velocity (MVOV) Demonstrates Asymmetric Lower Extremity Venous Flow In Normal Individuals

M. Lebow, D. Cassada, O. Grandas, S. Stevens, M. Freeman, M. Goldman - UT Knoxville, Knoxville, TN

Background: It has been demonstrated in autopsy studies (33% of 107 cadavers) and more recently by the analysis of contrast CT scans (66% of 50 patients) that a significant portion of the population harbors asymptomatic compression of the left iliac vein by the right iliac artery. Venography lacks the sensitivity to be considered a true "gold standard" (66% sensitive) while IVUS is over 90% sensitive. No studies have addressed the physiologic difference in flow hemodynamics between the left and right lower extremities in normal individuals. We use Doppler ultrasound with induced high venous outflow to demonstrate asymmetric flow in the lower extremities of normal individuals.

Methods: MVOV in the common femoral veins were recorded using Doppler ultrasound on 30 volunteers. Inclusion criteria included females age 18-30 years, BMI <30, and no history of venous disease or leg swelling. All studies were performed by the same experienced vascular technologist. Volunteers were instructed to lay supine while a blood pressure cuff was inflated to 140mmhg around the mid-thigh. Presence of arterial flow was confirmed with color duplex after cuff inflation. Patients were instructed to exhale and hold their breath to augment venous outflow prior to rapid cuff release after 2 minutes. Outflow velocity and waveforms in the left and right common femoral veins were recorded for analysis.

Results: The mean age was 20.9 years (range 19-28 years) and the mean BMI was 21.9 (range, 18 - 25). MVOV was lower on the left side in 22 volunteers, lower on the right in 7 and equal in one. The mean right MVOV was 117.23 cm/sec (SD +/- 46.95) and the mean left MVOV was 95.44 cm/sec (SD +/- 32.94) (P= 0.01). The mean outflow acceleration on the left side was also lower (632 cm/s²) when compared to the right (961 cm/s²) (P=0.03) There was no correlation between left or right MVOV with age, BMI or height.

Conclusions: Significant differences in venous flow of the left and right lower extremities are present in normal individuals when venous outflow is increased over resting flow. This finding correlates with anatomic studies demonstrating a predilection towards narrowing of the left iliac vein in normal subjects. Doppler ultrasound is a simple, non-invasive method of quantifying venous hemodynamics that may aid in selecting patients for further diagnostic testing or intervention.

Neovascularity and It's Treatment After Saphenous Ligation

R. Bush, K. Hammond - Midwest Vein and Laser Center, Dayton, OH

Background: Neovascularity is a leading cause for recurrent varices in those patients who have had a previous high ligation of the saphenous vein. Treatment of this condition remains somewhat controversial.

Methods: Thirty patients with neovascularity as an etiology of recurrent varicose formed the basis of this study. Ultrasound findings at the previous saphenofemoral junction (SFJ) and the outflow pattern that formed the recurrent varices was documented. All patients were followed for one year post treatment with foam sclerotherapy (Sotradecol - Bionesch) The number of treatments required as well as complications were noted.

Results: All patients had successful treatment of the neovascularity pattern at the groin level. Most patients require at least two treatments staged one month apart. This correlates with the number and size of channels present at the initial evaluation. The outflow pattern included flow into a retained saphenous vein, a duplicate saphenous vein, an accessory saphenous vein, or directly from the neovascularity channels into thigh varices. Ultrasound exam at one year revealed no recurrence of the neovascularity pattern. There was one case of partial femoral vein thrombosis as the only complication.

Conclusion: Neovascularity at the groin level after previous high ligation of the saphenous vein is a leading cause of recurrent varices. Foam sclerotherapy is a safe and effective therapy for neovascularity. Repeat groin operative procedures are contraindicated.

Cryo Strip Versus Classic Strip of the Great Saphenous Vein

T. M. A. L. Klem¹, J. M. Schnater², P. R. Schutte³, A. C. van der Ham⁴, C. H. A. Wittens⁵ - ¹Erasmus Medical Center, Rotterdam, Netherlands; ²Academisch Medical Center, Amsterdam, Netherlands; ³Albert Schweitzer Hospital, Dordrecht, Netherlands; ⁴Sint Franciscus Hospital, Rotterdam, Netherlands; ⁵Haga Hospital, The Hague, Netherlands

Background: Stripping of the great saphenous vein (GSV) is one of the most performed operations in Europe. The classic strip with a plastic wire is the standard operation technique for stripping the GSV. A novel operation technique is the cryo strip, which uses a cryoprobe. The technique consists of a small incision in the groin, dividing the tributaries and retrograde insertion of the cryoprobe in the GSV till 5 cm under the knee. The cryoprobe then freezes to -85° Celsius (-121° Fahrenheit) after which the GSV is stripped by pulling the cryoprobe. We performed a randomized controlled trial to determine the efficacy of the cryo-strip versus the classic strip.

Methods: All patients with incompetence of the GSV and a patent deep venous system were included in the trial. Classic strip and cryo strip were performed in our outpatient clinic. All patients had a venous duplex pre-operative and 6 months postoperative. Primary outcome was recurrence rate after 6 months of surgery confirmed by venous duplex.

Results: We included 539 patients and operated 494 patients.

Mean age was 51 year (20-84). There were 121 men and 373 women.

Cryo strip group: 249 patients, classic strip group: 245 patients.

Venous duplex after 6 months in the cryo-strip group:

An absent sapheno-femoral junction (SFJ) in 181 patients (73%), an incompetent SFJ in 49 patients (20%), an absent GSV in 173 patients (70%), an incompetent residual GSV in 54 patients (22%) and an occlusion of a residual GSV in 3 patients (1%). Missed to follow-up: 19 patients (8%)

Venous duplex after 6 months in the classic strip group: An absent SFJ in 175 patients (71%), an incompetent SFJ in 40 patients (16%), an absent GSV in 198 patients (81%), an incompetent residual GSV in 17 patients (7%). Missed to follow-up: 30 patients (12%)

Conclusions: The incidence of incompetence of the SFJ is higher in the cryo strip group than in the classic strip group. This difference is not significant.

The cryo-strip has a significant higher incidence of incompetence of the residual GSV ($p < 0.01$) An explanation for this difference could be the difficulty of probe insertion in the GSV and perforation of the GSV. We think the cryo strip of the GSV is obsolete and should be abandoned.

SCIENTIFIC SESSION III: FOAM & DIAGNOSTICS*Moderator: Peter Pappas, MD**Educational Objectives:*

1. Upon completion of this session attendees will understand:
2. If positioning of the patient undergoing foam sclerotherapy is important in preventing foam particle central migration.
3. The application of Duplex ultrasound and MRI in understanding the mechanism of pneumatic compression on the venous and muscles of the lower extremity.
4. The advantages or disadvantages in a randomized trial comparing treatment of varicose veins by surgery versus foam sclerotherapy.
5. The objectives of the National Venous Screening Program, how the NVSP has impacted the perception and education of the public and practitioners, and future direction in establishing nation-wide screening with emphasis on, risk of venous thromboembolism, venous clinical severity, primary care education, and timely specialty care referral and treatment.
6. The changes of MMPs and its naturally occurring inhibitors in the venous wall of varicose veins, and how this may impact on pathophysiology.
7. Demographic and risk factors that can effect pain following endovenous ablation.

16 Assessment of Techniques To Reduce Sclerosant Foam Migration During Ultrasound Guided Sclerotherapy*D. A. Hill, R. Hamilton – The Vein Treatment Centre, Calgary, AB, Canada*

Background: Endovenous chemical ablation is becoming an accepted technique for treatment of great saphenous vein insufficiency. However, echogenic phenomena in the right heart and high intensity transient signals detected by transcranial Doppler have been described by several investigators subsequent to foam sclerotherapy. An ischemic event following foam sclerotherapy of the great saphenous vein was reported recently in a patient with an occult patent foramen ovale. Concerns have also been raised about the effects of sclerosant foam on the pulmonary microvasculature. The present study compares the utility of 3 commonly used techniques for reducing sclerosant foam migration during ultrasound guided sclerotherapy of the great saphenous vein.

Methods: Group 1 consisted of 20 patients treated with ultrasound guided foam sclerotherapy of the great saphenous vein while lying supine with digital pressure used to occlude the saphenofemoral junction. In Group 2, 19 patients were injected with the leg elevated 30 degrees and digital pressure at the saphenofemoral junction. Group 3 involved 13 patients injected while the leg was elevated but without manual compression at the saphenofemoral junction. All patients were monitored with sub costal echocardiography during injection and for 3 minutes post injection.

Results: In Group 1, echogenic phenomena were demonstrated in the right heart in all 20 patients. In Group 2, echocardiography was positive

in 16 of 19 patients. In Group 3, echogenic cardiac phenomena were observed in 8 of 13 patients. There was a statistically significant difference in the incidence of echogenic phenomena between Groups 1 and Group 3 using Fisher's Exact Test ($p=0.005$). In Groups 1 and 2, a concentrated bolus of bubbles was frequently observed after release of digital pressure however only trace echogenic phenomena were seen in Group 3 where injection was performed with the leg elevated but no manual pressure at the saphenofemoral junction. No echogenic phenomena were observed in the left heart and there were no complications. Short term treatment results were equivalent among the 3 groups.

Conclusions: Endovenous chemical ablation of the great saphenous vein with foam sclerosants is best performed with the leg elevated and no digital pressure at the saphenofemoral junction. Further study is needed involving more subjects and foam produced from physiologic gases.

17 Combined MRI and Duplex Ultrasound Investigation of the Mechanism of Action of the Pneumatic Compression Devices

F. Lurie¹, H. Yoon², V. Scott³, R. L. Kistner¹ – ¹University of Hawaii and Kistner Vein Clinic, Honolulu, HI, ²Hawaii Permanente Medical Group, Inc., Honolulu, HI, ³Keck School of Medicine USC, Los Angeles, CA

Background: The velocity and flow increase in deep veins is considered as the major mechanism DVT prevention by intermittent pneumatic compression (IPC). The origin of these hemodynamic changes has been never investigated by direct observation. It is unknown if the IPC displace the blood from small veins, superficial veins, or from compressed segments of deep veins. Although limited data on behavior of individual veins under compression is available, simultaneous measurements were never performed. The aim of this study was to measure changes in volume of subcutaneous tissue and veins, and subfascial tissue and veins caused by IPC, and to investigate their relationships to changes in blood flow in deep and superficial veins.

Methods: Five healthy volunteers with a mean age of 37 years participated in this study. The calf garments of two IPC devices, with different compression mechanisms were tested (WizAir -Medical Compression Systems, Inc, Ltd, Or-Akiva Israel, and VenaFlow -AirCast Inc., Summit, NJ).

The MRI was acquired with the garment pressure of 0 (baseline) and at maximum compression using a Philips 1.5T magnet (Philips Medical Systems, Bothell, WA) with a dedicated extremity coil. The following parameters were used: TR: 440 ms; TE 13 ms; 4 mm slice thickness with 0 mm gap; Field of view: 180 mm; Matrix 512x512 or 1024x1024; 20 slices were acquired; NEX: 4. Duplex scans were performed in same subjects to measure velocity and flow changes in the Great Saphenous and Femoral veins in lower thigh associated with using the two IPC devices.

Results: Compression with both of the tested devices was associated with measurable decrease in volume of subcutaneous tissue under the garment ($p < 0.001$), total volume of superficial veins ($p = 0.004$), and volume of the GSV ($p = 0.038$). There were no measurable changes in subfascial volume of the calf under the garment.

Flow increase in FV and GSV under compression highly correlated with decrease in volume of superficial veins ($r = 0.77$ and $r = 0.74$ respectively), but not with changes in deep veins volume ($r = 0.3$ and $r = 0.15$). Increase in flow in FV was also highly correlated with increase in GSV flow ($r = 0.79$). A single strongest predictor of venous flow increase was the change in subcutaneous veins volume ($r^2 = 0.73$, $p = 0.0002$ -linear regression).

Conclusions: 1. MRI imaging provides valuable information on changes in intra- and extra - venous volumes of the extremity under compression.

2. Displacement of blood from the subcutaneous veins into the deep venous system is most likely the major contributor to hemodynamic action of the IPC.

18 Comparison Between Surgical Treatment and Ultrasound-Guided Microfoam Sclerotherapy For Patients With Primary Varicose Veins In the Lower Limbs: Early Results of A Randomized Controlled Trial

M. Figueiredo, S. P. Araujo, F. Miranda Jr - Escola Paulista de Medicina - Unifesp, Uberlandia, Brazil

BACKGROUND: This is a prospective study carried out by comparing patients with chronic venous insufficiency (CVI) under the C5EpAsPr CEAP classification submitted to operative treatment versus microfoam echosclerotherapy over a period of six months.

METHODS: Sixty patients were selected with a number of them submitted to operative treatment with overall saphenectomy, removal of collaterals and perforating vein incompetent (n= 29) and microfoam echosclerotherapy using the Tessari technique. The primary endpoints were the clinical scores of venous severity under the CEAP clinical classification (pain, oedema, inflammation, hyperpigmentation and lipodermatosclerosis); the secondary endpoints assessed effectiveness of the vascular ultrasound therapy and the complication arising from the treatments.

RESULTS: The two patient groups were compared both before and after treatment, and were shown to be statistically equal. The inflammation, hyperpigmentation and lipodermatosclerosis scores were also shown to have improved under both treatments employed (statistically not significant). In the assessment with the vascular ultrasound, the efficacy in the microfoam echosclerotherapy was 77.8% (n/N-21/27) against 89.6% (n-N 26/29) of the patients submitted to operative treatment in the final assessment of 180 days (statistically not significant).

CONCLUSIONS: Improved clinical scores in the CEAP venous severity (pain, edema, inflammation, hyperpigmentation and lipodermatosclerosis) in both surgical treatment and echosclerotherapy for period six month.

Pacientes	Echosclerotherapy	Surgery
N- all patients	27	29
n- success	21	26
%n/N	77,8	89,7



Segment	Surgery	Surgery	Surgery	Echoesclero-therapy	Echoesclero-therapy	Echoesclero-therapy
	Treatment	Sucess	%	Treatment	Sucess	%
Great Saphenous vein (thigh)	27	26	96,30	25	20	80
Great Saphenous vein (below knee)	23	21	91,30	24	16	66,67
Short Saphenous vein	3	3	100	4	2	50
Collateral thigh	1	1	100	2	2	100
Collateral below knee	9	7	77,78	12	10	83,3
perforator thigh	1	1	100	--	--	--
perforator below knee	8	7	87,50	7	4	57,1
Total	72	66	91,67	74	54	72,97

11:30 am

19

MINI PRESENTATIONS

(Mini Presentation 6)

National Venous Screening Program – An Update

Marc Passman, MD

Thursday

11:35 am

20 WITHDRAWN

Thursday

Patient Characteristics and Treatment Factors That Affect Pain Following Endovenous Laser Treatment (EVLT) For Venous Insufficiency

P. A. Hertzman, B. Peterson² - ¹Vein Care of New Mexico, Los Alamos, NM, ²University of New Mexico, Albuquerque, NM

Background: Pain following EVLT for venous insufficiency is common, yet limited information is available regarding what factors influence its incidence or severity. Our objective was to determine the effect of patient characteristics and treatment factors on pain following EVLT.

Methods: Incompetent veins were treated using ultrasound guidance with a 14 Watt, 810 nm diode laser after tumescent anesthesia. The laser fiber was withdrawn at 1-2 mm per second delivering between 75 and 140 joules per cm. Patients recorded pain on a 0-10 scale (0=no pain; 10=most severe pain) beginning on the day of treatment. All patients were seen and duplex ultrasound was performed one week following EVLT. We analyzed results for both peak pain and mean pain for the first seven days for 40 procedures in 27 patients (Females-17; Males-10; Mean Age=50.52 ± 11.91 years; Range=28-81 years; Mean BMI= 27.23±5.93 kg/m²) by linear regression analysis, Pearson product-moment correlation coefficients, and t-test comparisons.

Results: The treated vessels had closed in all cases and no DVTs were identified. All patients experienced some pain during the first week which was mild on average (mean = 3.437 SD= 2.314; range= .29 - 10). Pain most commonly peaked on either Day 2 - 42.5% (n=17) or Day 7 - 45.0% (n=18). The Peak pain scores were mild to moderate (mean = 4.925; SD=2.615; range = 1-10). The peak use of analgesics was on Day 1. The most commonly used medications were Tylenol and Ibuprofen. No pain medications were used on 37% of the patient-days during the first week. The means, correlations (R) with pain, and P values for patient characteristics and treatment factors are shown in this table:

Peak Pain	Mean Pain							
Patient Characteristics	N		R	P	R	P		
Gender	27		0.397	0.011	0.330	0.037		
Leg treated: Right = 20; Left =20	40		0.126	0.439	0.078	0.631		
Vein GSV=28; SSV=9; other=3	40		0.425	0.006	0.324	0.041		
	N	Mean	SD	Range	R	P	R	P
Age (years)	27	59.52	11.91	28-81	0.105	0.521	0.052	0.748
BMI (kg/m ²)	24	27.23	5.93	18.5-38.6	0.091	0.596	0.137	0.427

Max Vein Diameter (mm)	30	8.27	3.32	4.1-17.9	0.444	0.014	0.451	0.012
Access vein diameter (mm)	40	4.97	1.34	1.59-8.7	0.274	0.150	0.285	0.134
Treatment Factors								
Laser Treatment Time(sec)	40	206.65	60.59	101-299	0.345	0.029	0.323	0.042
Vein Length treated (cm)	38	31.03	10.02	15-47	0.320	0.050	0.384	0.017
Laser Power total (joules)	40	2858.50	843.25	1414-4185	0.303	0.057	0.263	0.101
Laser power (J/cm)	38	91.44	5.51	80.9-110.7	0.126	0.450	0.114	0.497

T-test comparisons showed increased pain in women vs men ($P < 0.05$) and for GSV vs other veins ($P < 0.05$)

Conclusions: Pain during the week following EVLT is on average relatively mild even at its peak and rarely requires pain medication stronger than over the counter analgesics. The level of pain is significantly more common in women, when treating the GSV, and in veins with larger maximum diameters. Treatment factors significantly associated with increased pain include laser treatment time and length of the vein treated.

12:00 pm

AMERICAN COLLEGE OF PHLEBOLOGY SCLEROTHERAPY SESSION

Moderator: Steve Zimmet, MD & Nick Morrison, MD

Educational Objectives:

1. *Better utilize sclerotherapy to treat incompetent varices*
2. *Minimize risk of complications of sclerotherapy*
3. *Understand issues related to the importation, compounding and off-label use of sclerosants*

12:00 pm

Office Set-Up and Sclerotherapy Techniques

Nick Morrison, MD

12:15 pm

Sclerotherapy: Cleaning Up Before & After Endovenous Laser

Robert Min, MD

12:30 pm

X-Ray Guided Sclerotherapy

Mel Rosenblatt, MD

12:45 pm

Sclerosants: Importation, Compounding and Off- Label Use

Steve Zimmet, MD

1:30-5:50 pm

INDUSTRY WORKSHOPS (Three 80-Minute Sessions)

Ultrasound Investigations for Venous Disease

Moderator: Nicos Labropoulos, MD

Educational Objectives:

1. *Understanding of basic normal venous anatomy identified by venous ultrasound.*
2. *Understanding of diagnostic criteria for venous thrombosis using venous ultrasound.*
3. *Understanding of diagnostic criteria for venous insufficiency (deep, superficial, perforator) using venous ultrasound*

Endovenous Ablation of the Saphenous Vein

Moderator: Michael Vasquez, MD

Educational Objectives:

1. *Understand and perform U/S guided access of an enlarged saphenous vein based on practice on a model.*
2. *Discuss the importance and technique of intra-compartmental tumescent anesthesia for the performance of endovenous saphenous vein ablation.*
3. *Identify different modalities of saphenous vein ablation for possible integration into their practice.*

Pharmaco-Mechanical Thrombectomy (PMT)

Moderator: Peter Lin, MD

Educational Objectives:

1. Understand endovascular treatment strategies of acute deep venous thrombosis.
2. Understand the role of mechanical thrombectomy in the treatment of acute deep venous thrombosis
3. Be familiar with various mechanical thrombectomy devices in the treatment of acute deep venous thrombosis.
4. Have insight into potential applications of pharmacomechanical thrombectomy in acute deep venous thrombosis.

Venous Ulcer Wound Care

Moderator: William Marston, MD

Educational Objectives:

1. Evaluate various methods of compression and the advantages and disadvantages of each in the treatment of venous leg ulcers
2. Consider the vast range of products available to apply to the wound surface of venous leg ulcers and learn strategies to choose the best ones for each leg ulcer
3. Review the active therapies available that are proven to accelerate the healing of leg ulcers and demonstrate proper application techniques for these products

OR CONCURRENT SYMPOSIUM SESSION

1:30 – 2:50 pm

Venous Coding and Maximizing Reimbursement

Moderator: Robert Zwolak, MD

Educational Objectives:

1. Use appropriate category one CPT codes to report standard venous operations
2. Understand the requirements for development of new CPT codes
3. Have a working familiarity with the method by which CPT codes are valued

3:00 – 4:20 pm

Venographic Assessment

Moderator: David Gillespie, MD

Educational Objectives:

1. Understand the indications and techniques for performing ascending venography
2. Understand the indications and techniques for performing ilio/cavography
3. Understand the indications and techniques for performing ovarian vein/pelvic dumping imaging

3:00 – 3:15 pm

Ascending/Decending Venography

David Gillespie, MD

3:15 – 3:30 pm

Venographic Assessment of Pelvic Congestion Syndrome

Mark Meissner, MD

3:30 – 3:45 pm

Extremity Venography For Venous TOS

Marc Passman, MD

4:30 – 5:50 pm

What To Do With Recurrent Varicose Veins?

Moderator: Andre van Rij, MD

Educational Objectives:

1. *Understand the causes of recurrence of varicose veins and the role that neovascularisation has in this*
2. *Gain a basic understanding of the biology of neovascularisation, and recanalisation,*
3. *Be aware of how this varies with different treatments of varicose veins and how it might be prevented.*
4. *Be familiar with treatments for recurrence and their relative merit.*
5. *Have a rationale for counseling patients regarding the risk of recurrence following varicose vein treatment.*

PLEASE NOTE: The following evening symposium is included in the registration fee for physicians and allied health professionals. However, seating is limited and pre-registration is required. We regret that due to strict codes, spouses and guests may not attend.

6:30 – 8:30 pm

EVENING SYMPOSIUM

Supported by Bacchus Vascular and Sanofi Aventis.

THE TIMES THEY ARE A-CHANGING: VENOUS THROMBOEMBOLISM UPDATE 2008

Educational Objectives:

1. *Be familiar with the latest ACCP Chest Guidelines*
2. *Understand current concepts regarding the treatment choices and duration of treatment for venous thromboembolism*
3. *Understand the differences between iliofemoral thrombosis and other forms of venous thrombosis*

6:30 – 6:50 pm

Putting New Joint Commission Quality Standards For DVT Into Hospital Practice

Joseph Caprini, MD

6:50 – 7:10 pm

The Role of IVC Filter Placement In DVT Prophylaxis and Treatment

David Gillespie, MD

7:10 – 7:30 pm

The Relationship Between the Location of Thrombosis and the Severity of the Post-Thrombotic Syndrome

Peter Neglan, MD

7:30 – 7:50 pm

Iliofemoral DVT Thrombus Removal Techniques: Safe and Effective

Michael Zatina, MD

7:50 – 8:10 pm

Mechanolytic Intervention For Iliofemoral DVT and the Need For A RCT

Anthony Comerota, MD

8:10 – 8:30 pm

Panel Discussion/Q&A

FRIDAY, FEBRUARY 22, 2008

7:00 am Continental Breakfast / Exhibits Open

7:30 am

SCIENTIFIC SESSION IV: CHRONIC VENOUS DISEASE

Moderators: Michael Ricci, MD & Marc Passman, MD

Educational Objectives:

1. Upon completion of this session attendees will be able to:
2. Understand the variability in venous Duplex laboratory reporting and the need for uniformity.
3. Understand the important application of intravascular ultrasound in placement of vena cava filters in multi-trauma patients with emphasis on technique, anatomic variations, complications, and early durability.
4. A novel technique utilizing an endovenous valve stent for treating patients with deep venous insufficiency.
5. Understand the hemodynamic relation between the iliac venous system and the saphenofemoral junction.
6. Appreciate the complex nature of varicose vein formation and chronic venous disease, and the role that hypoxia may have on its pathogenesis.

7:30 am

22 Use of A Structured Audit Tool In Assessing Venous Duplex Reports

D. L. Wooster - University of Toronto, Toronto, ON, Canada

Background: Venous duplex reports of studies performed to investigate patients with leg pain and swelling (suggestive of deep venous thrombosis) have been noted to be of variable quality. A structured audit tool, based on published guidelines, can give quantitative assessments of such reports. Service gaps, as defined by technical protocol and performance gaps and physician interpretation gaps, can be identified in discrete areas of the duplex study by such an audit. A variety of focused interventions have been suggested to stimulate guideline implementation and continuing medical education around these issues. The aims of this study were to apply the audit tool to identify service gaps and use the results to identify strategies for quality improvement.

Methods: The venous component of a previously validated structured audit tool was applied to 100 venous duplex reports from community labs and hospital imaging departments. The audit tool contained 28 elements in 8 domains, based on SVU, ICAVL, CPSO and RSNA ultrasound practice standards. The audit allowed for quantitative scoring of each domain. The results were analyzed to identify common themes in order to infer areas for guideline implementation and focused education initiatives.

Results: The analysis of 100 reports from 7 labs and 4 hospitals showed overall average scores of 2.6 / 5 (range 1.8 - 4.2). Of the 8 domains, demographics (3.9), indication (3.9) and test performed (3.5) compared

favourably to other applications of the tool. Description of the test (2.2), findings (2.3), limitations (1.8), interpretation (2.8) and overall clinical applicability (2.6) fell below acceptable norms. Labs with ICAVL status performed better; there was no difference between community- and hospital-based facilities otherwise. Thematic analysis of the results showed a) systems issues, b) knowledge gaps, c) application gaps and d) overall service gaps in venous duplex study reports. Educational interventions were identified for each issue and repeat audits demonstrated practice change outcomes.

Conclusions: Multiple gaps are identified in venous duplex reports. Focused interventions are recommended to improve the quality and clinical relevance of such reports. Repeat audits of selected domains can be used to monitor and document quality improvement.

23 Intravascular Ultrasound Guided Inferior Vena Cava Filter Placement In the Multi-Trauma Patients From Global War On Terrorism: A Single Center Experience

G. Aidinian, A. A. Amin, P. W. White, E. Adams, C. J. Fox, M. Cox, D. L. Gillespie - Walter Reed Army Medical Center, Washington, DC

Background: Blast and high velocity fragments have resulted in a multitude of complex extremity and soft tissue injuries. Consequently, there is increased risk of venous thromboembolism from prolonged immobilization, inability to use extremity compression devices, and interrupted anticoagulation. In a percentage of these patients, intravascular ultrasound (IVUS) guided inferior vena cava (IVC) filter insertion was used due to renal failure, or high transport risk due to pulmonary failure, open abdomen, or hemodynamic instability. The objective of this study was to review our experience in bedside IVUS guided insertion of IVC filters in military multi-trauma patients.

Methods: A retrospective analysis was performed of all IVUS guided bedside IVC filter placed by the Vascular Surgery Service at Walter Reed Army Medical Center between August 2003 and October 2007. Abdominal x-rays were performed on all the patients to document filter location. Injury Severity Score (ISS) was calculated for each patient and compared to published civilian controls.

Results: Over the time period studied there were a total of 66 patients who underwent IVC filter placement. Fourteen of these patients had bedside IVC filter placed under IVUS. There were 13 males and 1 female with average age of 26 years. The mean (\pm SD) ISS for military bedside IVUS placement was 37.2 (\pm 9.9) compared to 25.1 (\pm 2.2), reported in civilian trauma patients (Rosenthal et al. *J Vasc Surgery* 2004;40:958-64). The most common cause of injury was from explosive devices (57%), followed by gun shot wounds (28%), rocket propelled grenade (7%), and motor vehicle crash (7%). Average hospital length of stay was 43 days. 13 patients had Günther Tulip filter inserted and 1 patient had TrapEase filter inserted. Indications for filter insertion were deep venous thrombosis (DVT) in 36% of patients, and pulmonary embolus (PE) in 28%. 35% had IVC filters inserted prophylactically.

Conclusion: Military trauma population ISS is considerably higher than what is reported in the civilian population. The bedside IVUS guided IVC filter insertion is particularly useful in this population with the renal failure, or high transport risk due to pulmonary failure, open abdomen, or hemodynamic instability.

24 The Effect of Pressure On Migration and Further Characterization of the Venous Ulcer Fibroblast

*G. Sriver, A. Stanley, M. A. Ricci, K. Corrow, M. Slusarczyk, S. Shackford, J. Adams, G. Steinhorsson, D. Berges, A. Howard
- University of Vermont, Burlington, VT*

Background: Elevated atmospheric pressures have been found to alter in vitro fibroblast wound healing. An important aspect of wound healing involves the complex process of fibroblast migration. We hypothesized that neonatal fibroblasts (NNF) grown under elevated pressure will demonstrate delayed migratory ability and show an attenuated response to the mitogen PDGF. In addition, it has been hypothesized that fibroblasts subjected to years of chronic venous insufficiency (CVI) respond by aging prematurely and achieve a state of cellular senescence. If this is the case, and if pressure is the physiologic stimulus for the phenotypic changes and premature aging seen in both fibroblasts grown from venous ulcers and NNF grown under pressure, then these cell populations should both demonstrate shortened telomere lengths.

Methods: A pressurized incubator was used to culture neonatal fibroblasts at atmospheric pressure (ATM) and at ATM + 60 mmHg for 2 weeks. Cells were then placed onto a fibronectin coated permeable membrane. Cells were treated with PDGF- $\beta\beta$ or left untreated, were fixed after 12 or 24 hours, and the mean number of migrated cells were recorded under each experimental condition. The pressure incubator was also used to culture NNFs at ATM and ATM + 120 mmHg, as well as venous ulcer fibroblasts at ATM for a period of 2 weeks. DNA was isolated from these cells, and PCR was performed on the southern blots to determine telomere restriction fragment length among each cell population.

Results: Independent of PDGF- $\beta\beta$ application, fibroblasts grown under elevated pressure demonstrated less migration than NNFs grown at atmospheric pressure ($P=0.004$). Stimulation with PDGF- $\beta\beta$ increased the migration rate among both NNFs under elevated pressure and NNFs at atmospheric pressure, as compared to the untreated cells ($P<0.001$). The migratory response to PDGF- $\beta\beta$ stimulation was not significantly different between NNFs grown under elevated pressure and NNFs at atmospheric pressure ($P=0.17$). Telomere length analysis demonstrated that the restriction fragment length was identical among NNFs under pressure, NNFs at atmospheric pressure, and venous ulcer fibroblasts.

Conclusions: This study demonstrated that elevated pressure alters fibroblast function, leading to a decreased in vitro migratory ability in these cells. However, NNFs grown under pressure retained their ability to migrate in response to PDGF- $\beta\beta$ stimulation. The finding of equivalent telomere lengths in venous ulcer fibroblasts, NNFs under pressure, and NNFs at atmospheric pressure suggests that while the effect of pressure on fibroblasts may induce cellular changes similar to premature aging, that these fibroblasts do not become truly senescent.

EUROPEAN VENOUS FORUM – FIRST PLACE WINNER

Haemodynamic Assessment of Iliac Veins and Their Relation With the Sapheno-Femoral Junction

P. Brazis¹, R. Piotrowicz¹, N. Labropoulos², A. Jawien¹

¹Department of Surgery, Collegium Medicum, Nicolaus Copernicus University, Bydgoszcz, Poland - ²Division of

Vascular Surgery, University of Medicine & Dentistry of New Jersey New Jersey Medical School, Newark, NJ USA

Purpose: Iliac vein reflux has not been evaluated in patients with chronic venous disease (CVD). This prospective study was designed to determine the prevalence of iliac vein reflux in relation to saphenofemoral junction (SFJ) reflux in the whole spectrum of CVD.

Methods: One hundred and forty three limbs in 72 patients were prospectively evaluated by duplex scanning and clinical examination. Patients were included from the whole spectrum of CVD and were graded according to the CEAP classification. The iliac veins were assessed just above the inguinal ligament in standing position by the Valsalva test. The cut-off value for iliac and femoral vein reflux was set at >1s and for the superficial veins at >0.5s. SFJ was examined at four points above and below the terminal and preterminal valves. The diameters of all the relevant veins were measured as well.

Results: Iliac reflux was found in 58 limbs (40.5%). The prevalence of iliac reflux was significantly higher in more advanced CEAP classes C4-C6 41(28.7%) vs 16(11.2%) in C1-C3, $p<0.05$. Iliac reflux was associated with SFJ incompetence. At this level reflux was detected more frequently in patients with iliac reflux than in patients without it 48(88.9%) vs 6(11.1%), $p<0.05$. The diameters in SFJ region were also significantly larger in patients with iliac reflux compared to those ones without (CFV 16.2 vs 15.1 and SFJ 7.5 vs 4.6 mm, $p<0.05$ for both).

Conclusion: Iliac vein reflux is significantly more prevalent in the presence of SFJ reflux and suggests that the presence of the latter is the cause of the former. The diameters of CFV and SFJ are greater in the presence of iliac vein reflux. These findings are more evident in patients with skin damage and provide a good hemodynamic explanation for the severity of the disease.

Is Hypoxia A Feature of Varicose Vein Disease?

B. Sharp^{1,2}, B. T. Navin¹, C. Monaco^{1,2}, E. Paleolog^{1,2}, A. H. Davies² - Kennedy Institute of Rheumatology, Imperial College, London, UK; Charing Cross Hospital Department of Surgery, Oncology and Anaesthetics (SORA), Imperial College, London, UK

Background: An imbalance between matrix metalloproteinases (MMP) and the MMP inhibitors TIMP is thought to play an important role in varicose vein disease through alterations in the extracellular matrix. It is likely that MMPs/TIMPs are stimulated by inflammatory cytokines. Hypoxia has been previously suggested to be involved in varicose vein disease. Hypoxic episodes are known to influence, through the modification of transcription factors, the release of cytokines and growth factors e.g. VEGF. The most important transcription factor is Hypoxia inducible factor (HIF). In this study we investigated whether the HIF family members HIF-1 α and HIF-2 α were present in varicose veins, and whether their presence influenced certain MMPs/TIMPs and cytokines that are already thought to play a role in varicose vein disease.

Materials And Methods: Varicose vein segments were obtained from 15 patients undergoing corrective surgery. RNA extraction was performed on the vein tissue and the message levels for MMPs (MMP-2, MT1-MMP), TIMPs (TIMP-2, TIMP-3), cytokines (VEGF, TNF- α , IL-1, IL-6), HIF-1 α and HIF-2 α were quantified by Sybr Green I PCR (Polymerase chain reaction), and expressed relative to a pool of mRNA from healthy vein.

Results: Both HIF-1 α and HIF-2 α were expressed in varicose veins. There was significantly lower expression of HIF-1 α (median=0.7950) than HIF-2 α (median=8.105) in proximal varicose vein segments (Mann-Whitney $p=0.0010$).

HIF-1 α mRNA showed significant correlation with MMP-2 ($p=0.0211$) and TIMP-2 ($p=0.0435$) mRNA levels. There was no significant relationship between HIF-1 α and either MT1-MMP or TIMP-3. When compared with cytokine expression there was a significant correlation of HIF-1 α with VEGF ($p=0.0431$), TNF- α ($p=0.0347$) and IL-1 α ($p=0.0122$). However, there was no correlation between HIF-1 α and IL-6.

HIF-2 α showed very significant correlation with MT1-MMP ($p=0.0043$). There was no correlation between HIF-2 α and MMP-2, TIMP-2 or TIMP-3. In terms of cytokine mRNA levels, HIF-2 α expression showed very significant correlation with TNF- α ($p=0.0347$) only.

Conclusion: For the very first time we have shown that HIF-1 α and HIF-2 α are expressed in varicose veins. HIF-2 α was significantly more abundant in proximal varicose veins. HIF-1 α displayed a statistically significant correlation with MMP-2 and TIMP-2. In contrast, HIF-2 α showed a very significant correlation with MT1-MMP. When correlating HIFs with the cytokines, HIF-1 α showed significant correlation with VEGF,

TNF- α and IL-1, whereas HIF-2 α showed very significant correlation with TNF- α . These data suggest a potential association between hypoxia and cytokines in regulating MMP/TIMP balance and thus altering the extracellular matrix in varicose vein disease.

9:10 am

Coffee Break / Visit Exhibits

Friday

SCIENTIFIC SESSION V: ENDOVENOUS STENTING

Moderators: Robert McLafferty, MD & Peter Neglen, MD

Educational Objectives:

1. Upon completion of this session attendees will be able to:
2. Understand the variability in venous Duplex laboratory reporting and the need for uniformity.
3. Understand the important application of intravascular ultrasound in placement of vena cava filters in multi-trauma patients with emphasis on technique, anatomic variations, complications, and early durability.
4. A novel technique utilizing an endovenous valve stent for treating patients with deep venous insufficiency.
5. Understand the hemodynamic relation between the iliac venous system and the saphenofemoral junction.
6. Appreciate the complex nature of varicose vein formation and chronic venous disease, and the role that hypoxia may have on its pathogenesis.

25 Venous Stenting Across the Inguinal Ligament

P. Neglén, P. Tackett, S. Raju - River Oaks Hospital, Flowood, MS

Background: Stenting of arteries across joints is prohibited due to frequent stent fracture and secondary stenosis or occlusion. The aim of this study is to assess the fate of venous stents placed across the inguinal ligament.

Methods: During 1997 to 2005, 144 limbs had iliofemoral stenting performed extending beneath the inguinal ligament into the common femoral vein for non-thrombotic iliac vein lesions, so-called compression lesions (NIVL; 22 limbs), chronic thrombotic non-occlusive obstruction (PTS-obstr; 80 limbs), and chronic thrombotic occlusion (PTS-occl; 42 limbs). Female/male ratio = 107/37; left/right limb = 95/49; median age 56 years, range: 22-86; previous DVT 122 limbs. Braided stainless stents were most frequently used, but in 12% of limbs nitinol mesh stents were placed. The patients were followed with venography to assess patency and stent integrity 3 and 9 months post-intervention and then annually.

Results: The patients were followed for mean 24 months (range: 1 - 91 months) Twenty stent systems occluded during the observation period; 8 limbs had successful and 5 limbs failed removal of thrombus, 7 limbs had no intervention. Intervention of patent stents was performed in 24 limbs; 19 limbs had balloon angioplasty of in-stent restenosis (ISR), 3 had further distal stent extension of the CFV, and one had proximal extension into the IVC. Only one stent was crushed at the inguinal ligament, a nitinol stent, which was treated by insertion and angioplasty of a braided stainless steel stent. No other stents were compressed at this site and no stent fractured. The overall assisted-primary and secondary patency was at 42 months 81% and 88% (NIVL 100% and 100%; PTS-obstr 88% and 92%; PTS-occl 66% and 78%, respectively).

Conclusions: Contrarily to arterial stenting, venous stenting may be performed with braided stainless stents across the inguinal crease with no stent fractures or narrowing due to external compression or hip joint movement. Patency is not associated with the sub-inguinal site of stents, but related to the etiology of the obstruction with secondary patency depending on presence and severity of post-thrombotic obstructions. Iliac vein stents can be safely extended across the groin crease to ensure adequate inflow without fear of compression, fracture or thrombosis related to hip flexion.

26 Reinterventions After Venous Stenting For Chronic Venous Disease

S. Raju¹, P. Tackett², P. Neglén² - ¹University of Mississippi Medical Center, Jackson, MS, ²River Oaks Hospital, Flowood, MS

Background: Percutaneous ilio-femoral venous stenting has been shown to be effective, safe, and durable in both primary and postthrombotic disease. The objective of this study is to analyze those patients that required re-intervention.

Methods: Femoro-ilio-caval stenting was performed in 1060 limbs over a 9 year period (primary/ postthrombotic limb ratio = 555/505). Patients were followed clinically. Stent patency and rate of in-stent restenosis was assessed by venography and ultrasound scanning.

Results: Reinterventions were required in 171 limbs (16%) (11% primary and 16% postthrombotic limbs ($p=0.06$). Median age, sex ratio, limb side and time of reintervention after the initial procedure (13 months) were similar regardless of etiology of obstruction. Indication for reintervention: swelling 42%, pain 12% or combination 21%, stasis dermatitis/ulcer 12% or stent occlusion 13%; residual or recurrent swelling was more common for primary limbs, pain more common in postthrombotic limbs. Stent occlusion only occurred in postthrombotic limbs; seven had successful thrombolysis and two thrombectomy. Proximal stent extension into the IVC was required in 16 primary limbs due to distal migration of the original stent, and in 12 postthrombotic limbs due to initial inadequate coverage of a postthrombotic IVC segment. Distal extension of the original common iliac vein stent was required in 39 primary limbs to cover previously overlooked non-thrombotic lesion of the external iliac vein in 18 and retroinguinally in 19 limbs. In 30 postthrombotic limbs, distal stent extension was required into external iliac vein (5 limbs) and common femoral vein (25 limbs) to cover postthrombotic strictures. Balloon dilatation of the in-stent restenosis was performed in 57% of limbs; in combination with stent extensions in 32% of limbs. Two types of in-stent restenosis were found, a soft lesion due to layered thrombus and a hard, more fibrous lesion.

Conclusions: Venous stenting for chronic venous disease is remarkably trouble free, with only a small fraction requiring reinterventions. Reintervention were performed to correct overlooked or new defects in inflow, outflow, and/or the stent. Soft in-stent lesions typically occur when inflow or outflow is compromised. The harder lesion occurs independently and is amenable to successful dilation with high pressure balloons. An aggressive stance in identifying and correcting pathology during the initial procedure may reduce the need for reinterventions and improve outcome.

10:20 am

27 **Withdrawn**

Friday

10:20 am

Venous Stent Registry Update

BK Lal, MD

10:25 am

AVF Update – Where the Forum Is Going

Mark H. Meissner, MD

10:30 am

Founders Award (TBA)

Presented By: Mark H. Meissner, MD

10:35 am

2007 Award Update

Introduced By: Mark H. Meissner, MD

2007 BSN Jobst Winner – Report

Danny Vo, MD, Mayo Clinic

10:45 am

2007 Servier Traveling Fellowship Winners – Report

Brian Knipp, MD, University of Michigan

10:55 am

2007 Sigvaris Fellowship – Announcement

David Gillespie, MD for Reagan Quan, MD, Walter Reed Army Medical Center

11:00 am

PRESIDENTIAL ADDRESS

Mark H. Meissner, MD

Introduction By: Joann M. Lohr, MD

12:00 pm

MEMBER BUSINESS LUNCH

Free Afternoon

Golf & Tennis

SATURDAY, FEBRUARY 23, 2008

7:00 am Continental Breakfast – Visit Exhibits

8:00 am

SCIENTIFIC SESSION VI: VENOUS THROMBOEMBOLISM

Moderators: Joseph Caprini, MD & Peter Henke, MD

Educational Objectives:

1. Upon completion of this session attendees will be able to:
2. Understand the utilization of Duplex ultrasound in defining temporal changes of venous thrombi.
3. Understand the potential usefulness of combining d-dimer and lower extremity Duplex ultrasound tests in predicting outcome for venous thromboembolism in high risk patients undergoing surgery
4. Understand the complex and controversial management of pregnant females that had previous ilio-caval stenting.
5. Understand the benefits and limitations of diagnostic modalities in patients with suspected venous thromboembolism
6. Understand the indications, strategy, technical aspects, pharmacologic drugs, mechanical application, and outcomes in treating patients with iliofemoral deep venous thrombosis with pharmacomechanical thrombolysis.

8:00 am

28 Time-Course Analysis of Venous Thrombus With Ultrasonographic Tissue Elasticity Imaging - Preliminary Findings

K. Uno^{1,5}, A. Tonomura², T. Osaka², T. Mitake², M. Suda³, M. Yamakawa³, Y. Isaka⁴, S. Homma⁵, T. Shiina³, K. Aonuma⁵ - ¹Namegata District General Hospital, Namegata, Japan, ²Ultrasound Systems Division, Hitachi Medical Corporation, Kashiwa, Japan, ³Graduate School of System and Information Engineering, University of Tsukuba, Tsukuba, Japan, ⁴Medical Branch, Academic Service Office for Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Japan, ⁵Cardiovascular Division, Institute of Clinical Medicine, Graduate School of Comprehensive Human Science, University of Tsukuba, Tsukuba, Japan

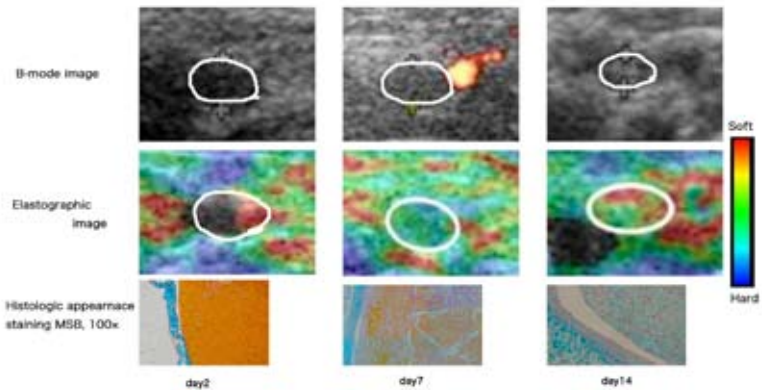
Background: With increasing age venous clots undergo an organization process during which they become adherent to the vessel wall. Therefore, one important factor influencing the decision whether or not to perform thrombolysis or thrombectomy for venous thrombosis is the age of the thrombus. Tissue elasticity imaging is a technology for imaging tissue hardness information using ultrasound. The aim of this study was to examine the diagnostic ability and an appropriate assessment procedure of this method for venous thrombus.

Methods: Conventional Ultrasonography (US) and US-elastography were performed in 25 patients diagnosed venous thrombosis in the lower extremities. All images were obtained with Ultrasound Scanner EUB-8500 (Hitachi Medical Corporation) and analyzed by an external personal

computer. First of all, we examined the elasticity image depending on the different ways of compression and drew a certain assessment procedure for evaluating venous thrombus. Secondly, we observed the venous thrombus with B-mode image, color Doppler image and elasticity image. We estimated the age of thrombus by these conventional ultrasonographic appearances and divided into three phases as follows: acute, sub-acute and chronic. Moreover, we compared the elasticity image with histological evaluation using a rat-based model by ligation of infrarenal Vena cava.

Results: 25 patients, 30 lesions (6 femoral vein; 1 popliteal vein; 22 calf vein; 1 superficial vein) were assessed. We could obtain the stable image by vibrating after initial compression to the area of the thrombus, and setting the region of interest (ROI) including muscle and excluding bone and artery. Mostly, acute phase of thrombi were represented with soft elasticity images, and chronic phase of venous thrombi were represented with hard elasticity images. Meanwhile, acute phase of thrombi presenting anechoic lesion were not imaged clearly, and mixed thrombi with a small amount of venous flow were difficult to differentiate fresh thrombi and venous flow. By histological examination using (figure), US-elastography demonstrated a harder image correlated with the increasing of fibroblast and collagen production in the clots, and recanalisation site showed a soft image.

Conclusions: Venous thrombi were imaged clearly with appropriate compression by US-elastography. We will continue to improve the elasticity image for the application of venous thrombus.



29 Do Preoperative D-Dimer Testing and Venous Duplex Scanning of the Lower Extremities Alter the Outcome in Patients At High Risk For Postoperative Venous Thromboembolism?

T. Yamaki¹, M. Nozaki¹, H. Sakurai¹, M. Takeuchi², K. Soejima³, T. Kono¹ - ¹Tokyo Women's Medical University, Tokyo, Japan, ²Nihon University, Tokyo, Japan, ³Tokyo Metropolitan Hiroo General Hospital, Tokyo, Japan

Background: To assess whether preoperative D-dimer testing and venous duplex scanning (VDS) of the bilateral lower extremities are necessary to identify patients at risk of postoperative venous thromboembolism (VTE).

Methods: One hundred and twenty-seven consecutive referral patients at high or highest risk for postoperative VTE according to the American College of Chest Physicians guidelines were evaluated using pretest clinical probability (PTP) score and D-dimer testing before VDS. After calculating PTP score, patients were divided into low risk (≤ 0 points), moderate risk (1 to 2 points), and high risk (≥ 3 points) PTP. After preoperative VDS was done, all patients received unfractionated heparin or low molecular weight heparin for postoperative VTE prophylaxis. Postoperative surveillance was also performed after operation.

Results: Of 127 referrals, orthopedic patients were the most predominant (42 patients, 33%), followed by gynecologic (30 patients, 24%) and general surgical (17 patients, 13%) patients. Sixty-eight (54%) patients were classified as low, 39 (31%) as moderate, and 20 (15%) as high PTP. Preoperative VDS identified 42 (33%) patients with DVT. Of these, 15 (12%) patients had proximal DVT and remaining 27 (21%) had distal DVT. The prevalence of DVT increased as the risk increased (7%, 56% and 75%, respectively). In the low risk PTP, D-dimer testing provided 80% sensitivity and 97% negative predictive value (NPV) in the diagnosis of DVT. Similarly, in the moderate PTP, the D-dimer testing showed 100% sensitivity and 100% NPV. In the high risk group, D-dimer testing achieved 100% sensitivity and 100% NPV in the diagnosis of DVT. Postoperative VTEs were found in 4 (3%) patients. Three orthopedic patients with low PTP who had preoperative normal D-dimer with no DVT developed symptomatic calf DVTs. One gynecologic patient with moderate PTP who had initial elevated D-dimer with no DVT developed pulmonary embolism. No propagation of DVT or new thrombus formation was found in patients who had preoperative DVT after the operation.

Conclusions: A combination of D-dimer testing and PTP may be effective in detecting patients who require preoperative VDS. However, postoperative VTEs are found predominantly in patients with low PTP, normal D-dimer and no preoperative DVT. Presence of preoperative DVT identified by VDS is not predictive of postoperative propagation of DVT or new VTE formation. Preoperative D-dimer testing and VDS of the bilateral lower extremities do not identify patients at risk of developing clinically important thromboembolic events.

Background: Ilio-caval stenting represent nowadays the first line treatment for disabling obstructive ilio-caval lesions. Most of the patients are young women which can procreate. We herein report our experience of pregnancy in women who had history of ilio-caval stenting.

Methods: From November 1995 to July 2007, 112 patients had ilio-caval stenting for obstructive venous disease in our department. Of these, 61 women were not menopaused. Seven pregnancy occurred in five patients (mean age 25 years) after stent deployment (one patient had 3 pregnancy). They had stenting for May-Thurner disease in 3 cases and during venous thrombectomy in 2 cases. All stents were self-expanding metallic stents located on the left common iliac vein. All of them received preventive treatment with low molecular weight heparin (LMWH) from the third month of pregnancy to one month after delivery and had to wear elastic stockings. Patients also had to sleep on their right side if possible. They were followed during the pregnancy by duplex-scan at 3, 6, 8 months and then one month after delivery.

Results: One patient had unrelated spontaneous abortion after 2 month of pregnancy. No deep venous thrombosis nor symptomatic pulmonary embolism occurred during pregnancy, delivery and post-partum. Four patients needed cesarean delivery and none had hemorrhagic complication. None of the patients had adverse effects of the treatment. Dupplex-scan showed compression of the stent(s) at 8 months in 3 cases with inflow obstruction in 2 cases. Post partum duplex-scan showed in all cases that stents were patent with no remaining stenosis. No stent had structural damage.

Conclusions: Ilio-caval stent(s) compression can occur during pregnancy but do not lead to structural damage of self-expanding stents. Despite this no deep venous thrombosis occurred with preventive LMWH treatment.

Background: Evidences-based guidelines for VTE diagnosis recommend that pre-test probability (PTP) of VTE and D-dimer before any objective diagnostic tests be performed as the initial screening test particularly in emergency room or out-patient clinics. The purpose of this study was to evaluate VTE diagnostic procedures in patients with suspected VTE prior to the implementation of the VTE Safety Toolkit.

Methods: The study was a part of a larger pre/post study to implement a VTE Safety Toolkit consisting of clinical algorithms for the prevention, diagnosis, and management of VTE. A vascular laboratory logbook and medical records of adult patients who underwent lower extremity venous duplex scans (VDS) during the 6-month pre-intervention period were retrospectively reviewed in order to identify the utilization patterns of VTE diagnostic tests including D-dimer, VDS for deep vein thrombosis (DVT), and ventilation and perfusion (VQ) scan or computerized tomographic (CT) angiography for pulmonary embolism (PE). We developed DVT/PE diagnostic algorithms as a component of the VTE Safety Toolkit. We made a determination using the diagnostic algorithm of whether the number and order of objective tests were appropriate given the VTE risk score and patient history.

Results: Approximately 972 lower extremity venous duplex scans in 818 patients with suspected VTE were performed in 6 months of the pre-intervention period at an academic medical center. Among the 818 patients, 112 patients (13.7%) were diagnosed with DVT by VDS. A quarter of patients with VDS were asymptomatic and 16 % (32/203) of these patients were diagnosed with DVT. Approximately 27% (30/112) of patients with acute DVT had serial VDS and propagation was identified in 9 patients with follow-up VDS (30%, 9/30). We categorized VTE diagnostic strategies into four; 1) duplex only, 2) D-dimer and duplex, 3) D-dimer/duplex/lung scanning by CT or VQ scans, and 4) duplex/CT or VQ scan. The rates of diagnosis of DVT/PE were higher in patients in the strategy included D-dimer ± Duplex ± CT/VQ compared to those in other strategies (please see the table below).

Conclusions: There was inappropriate utilization of VTE diagnostic tests. The VTE Safety Toolkit includes a tool requires referring providers to rate the PTP before obtaining an objective study for VTE diagnosis. The VTE Safety Toolkit diagnostic algorithms should increase the appropriateness of the diagnostic studies ordered.

Outcomes by VTE diagnostic strategies	1. Duplex only	2. D-dimer ± Duplex	4. Duplex ± CT/VQ
	535/818 (65.4%)	121/818 (14.8%)	102/818 (12.5%)
DVT diagnosis (112/818, 13.7%)	62/536 (11.6%)	11/121 (9.1%)	24/102 (23.5%)
PE diagnosis (58/818, 7%)	0	0	34/102 (33.4%)
Indications for Duplex scanning			Frequency (%)
1. Rule out DVT (with leg symptoms such as leg swelling or/and leg pain)			568/818 (69.4%)
2. Look for source of PE (with PE like symptoms such as chest pain or shortness of breath or PE diagnosed already by lung scan)			184/818 (22.5%)
3. Surveillance (without leg symptoms but at risk for VTE such as prolong bed rest or recent surgeries)			100/818 (12.2%)
4. Asymptomatic (no leg symptoms or PE symptoms)			203/818 (24.8%)

32 The Quantitative Benefit of Isolated, Segmental, Pharmacomechanical Thrombolysis For Iliofemoral DVT

J. Martinez, A. J. Comerota, S. Kazanjian, R. DiSalle, D. M. Sepanski, Z. I. Assi - The Toledo Hospital, Toledo, OH

Background: It is becoming increasingly recognized that early thrombus removal in patients with iliofemoral DVT reduces postthrombotic morbidity. Preserving valve function and relieving venous obstruction prevents deterioration of quality of life and loss of economic potential. The preferred method for treating iliofemoral DVT is catheter-directed thrombolysis (CDT). Recently, isolated segmental pharmacomechanical thrombolysis (ISPMT) has emerged as a treatment option for patients with extensive DVT. This technique isolates the venous segment being treated between two occluding balloons and delivers the plasminogen activator into the thrombus. The catheter assumes a spiral configuration and rotates at 1500 RPM, macerating the thrombus. Subsequently, the liquefied thrombus and remaining lytic agent are aspirated. The purpose of our study is to determine whether there are advantages to ISPMT and, if so, to quantify those advantages relative to CDT.

Methods: Forty-three patients treated with CDT at our institution between May 2003 and June 2007 were reviewed. Patients were divided into two groups, those treated with ISPMT (Trellis® 8 catheter, Bacchus Vascular, Santa Clara, CA) or those using CDT alone. Data obtained included demographics, extent of thrombus, procedural details, periprocedural evaluation, and thrombus resolution. CDT was performed by placing a multi-hole catheter directly into the thrombus; infusion was administered for varying periods of time, and repeat phlebography was used to determine treatment time. Amount of lysis was determined by comparison of pre- and post-procedure phlebographic images.

Results: Catheter-directed thrombolysis alone was used in 21 patients, and 22 had ISPMT incorporated as part of the strategy of thrombus removal. Treatment time (52.2 vs. 22.9 hrs; $P=0.0001$) and dose of rt-PA (55.3 vs. 32.5 mg; $P=0.007$) were decreased by the use of ISPMT. The use of ISPMT improved overall lytic success (84.3% vs. 92.3%; $P=0.029$) and more patients had complete thrombus resolution (Table). There was no difference in the use of adjunctive therapy such as venoplasty with or without stenting. Complication rates were similar and there was no major morbidity or mortality. Hospital length of stay and ICU length of stay were similar between the two groups.

Conclusions: The use of ISPMT offers more effective thrombus removal in less time and with a reduced dose of thrombolytic agent. However, decreased treatment time did not translate into decreased hospital or ICU stay. Longer-term follow-up is required to determine whether improved thrombus resolution translates to better functional outcome and reduced postthrombotic morbidity.

Percent of lysis by group		
% Lysis	CDT	ISPMT
Complete (≥ 95)	5/21 (23%)	15/22 (68%)
Significant (75-94)	12/21 (57%)	5/22 (23%)
Moderate (50-74)	4/21 (19%)	2/22 (9%)
Minimal (< 50)	0/21	0/22

9:40 am

Coffee Break / Visit Exhibits

Saturday

SCIENTIFIC SESSION VII: CHRONIC VENOUS DISEASE II

Moderators: Joann Lohr, MD & Fedor Lurie, MD

Educational Objectives:

1. Upon completion of this session attendees will understand:
2. The implications of chronic venous disease and venous hypertension on the adverse effect on arterial hemodynamics.
3. The risk factors implicated in patients with varicose veins that will progress to venous ulceration.
4. The risk factors associated with recalcitrant venous ulcer treated with compression.
5. The technical application of a neovalve for deep venous insufficiency, comparing two different experiences.

33 Lower Extremity Arterial Inflow Is Adversely Affected In Patients With Postthrombotic Venous Disease

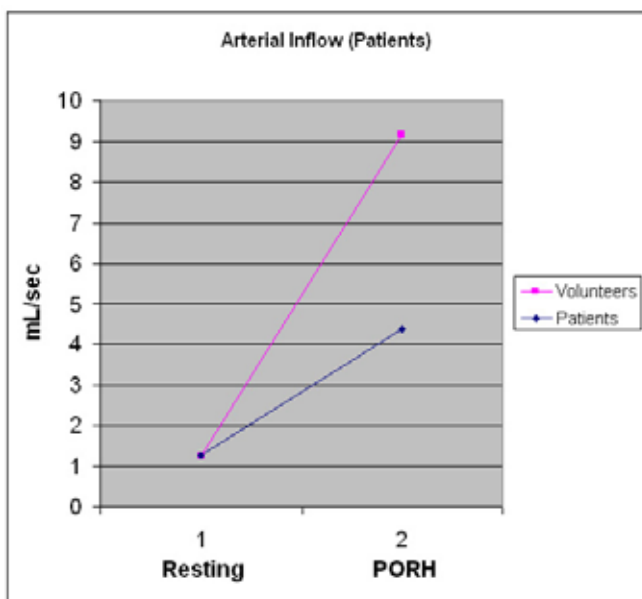
D. Paolini, L. Jones, A. J. Comerota - The Toledo Hospital, Toledo, OH

Background: Chronic venous disease of the lower extremity is due to venous hypertension resulting from reflux and/or obstruction. Studies in patients with postthrombotic venous disease with ambulatory leg discomfort have focused primarily on venous hemodynamics of the lower extremity. The impact of postthrombotic venous disease on arterial perfusion has not been evaluated. The purpose of this study is to evaluate whether arterial perfusion at rest and following stress induced by postocclusive reactive hyperemia (PORH) is adversely affected by postthrombotic venous disease.

Methods: Lower leg arterial perfusion was measured in 16 limbs with C3-C6 postthrombotic venous disease (study group) and compared to 22 disease-free limbs (control group). Neither group had any history, signs, or symptoms of arterial occlusive disease, and all had a normal ankle-brachial index at rest. Arterial perfusion was measured, using venous occlusive plethysmography, at rest and following 3 minutes of complete leg ischemia induced by a thigh cuff inflated to 20 mmHg above systolic pressure.

Results: Resting arterial inflow was similar in control and study groups: 1.26 mL/sec and 1.28 mL/sec (P=NS), respectively. PORH stimulated a 7.3-fold increase in arterial inflow to 9.17 mL/sec in the control group, whereas the study group increased only 3.4-fold to 4.38 mL/sec (P=0.0045) (Figure).

Conclusions: Arterial inflow is significantly diminished after PORH in patients with postthrombotic venous disease. These data suggest that the etiology of ambulatory leg pain in patients with postthrombotic venous disease is at least in part related to a reduction of arterial inflow during exercise.



34 Which Patients With Varicose Veins Are At Increased Risk of Chronic Leg Ulceration?

L. Robertson¹, A. Lee², K. Gallagher³, S. Carmichael³, C. Evans⁴, B. McKinstry¹, S. Fraser³, P. Allan¹, C. Ruckley¹, F. Fowkes¹ - ¹University of Edinburgh, Edinburgh, United Kingdom, ²University of Aberdeen, Aberdeen, United Kingdom, ³Lothian University Hospitals NHS Trust, Edinburgh, United Kingdom, ⁴NHS Lothian, Edinburgh, United Kingdom

Background: When prioritising clinical management there is a need to identify which patients with varicose veins will go on to develop chronic leg ulcer. This is the first study to report, in patients with varicose veins, the characteristics of venous disease and lifestyle factors related to an increased risk of ulceration.

Methods: A case control study compared 120 cases with varicose veins and an open or healed leg ulcer, with 120 controls with varicose veins but no leg ulcer. Assessment included: clinical classification of venous disease, duplex scanning, quantitative digital photoplethysmography, body mass index (BMI), and questionnaire on social class, smoking, current and previous leisure exercise, mobility at work and previous history of venous disease.

Results: Cases had a higher mean age than controls (61.1 years (13.4) versus 59.9 years (11.7), $p=0.01$). Severity of venous disease was linked to increased risk of ulceration. Other significant risk factors included history of deep vein thrombosis or pulmonary embolism (OR 4.1, 95% CI 1.8-9.7), increased BMI (OR 1.1, 95% CI 1.0-1.1) and smoking (OR 2.0, 95% CI 1.2-3.8), and remained so after adjusting for age and sex. Cases had reduced calf muscle pump power and limited range of ankle movement (not wholly due to the effects of an active ulcer) (both $p<0.05$). Reflux in the profunda, femoral and popliteal veins were also significantly associated with increased risk of ulceration.

Risk factors that were significant on univariate analyses were entered into a stepwise logistic regression model to determine which factors were independently associated with increased risk of ulceration.

Risk factor	Multi-adjusted odds ratio (95% CI)
BMI	1.08 (1.01-1.15)
Venous pump power	0.96 (0.92-0.99)
Dorsiflexion	0.88 (0.81-0.97)
Corona phlebectatica	4.52 (1.81-11.3)
Eczema	2.82 (1.12-7.07)
Lipodermatosclerosis	8.90 (1.44-54.8)
Reflux in popliteal vein	2.82 (1.03-7.75)

Conclusions: The results of this study confirm that, in patients with varicose veins, those with skin changes of chronic venous insufficiency and deep vein incompetence, are at greatly increased risk of ulceration. However, the risks may also be increased in those who smoke, are obese, and have conditions restricting ankle movement. A prognostic scoring system incorporating all these factors is being developed to assist clinical decision making.

35 Risk Factors Related To the Failure of Venous Leg Ulcers To Heal With Compression Treatment

D. J. Milic, S. S. Zivic, D. C. Bogdanovic, V. D. Milojkovic, M.A. Pejic, V. M. Popovic - Clinic for Vascular Surgery, Clinical Centre Nis, Nis, Serbia

Background: Compression therapy is the most widely used treatment for venous leg ulcers and it was used in different forms for more than 400 years. Published healing rates of venous ulcers obtained with compression therapy vary widely from 40-90%. According to numerous studies it has been suggested that the application of external pressure to the calf muscle raises the interstitial pressure resulting in improved venous return and reduction in the venous hypertension. Several risk factors have been identified to be correlated with the failure of venous leg ulcers to heal with compression therapy (longer ulcer duration; large surface area; fibrinous deposition present on >50% of the wound surface and an ankle brachial pressure index of <0.85).

Methods: An open prospective, single-center study was performed in order to determine possible risk factors associated with the failure of venous ulcers to heal when treated with multi-layer high compression bandaging system for 52 weeks. One hundred and eighty nine patients (101 women, 88 men; mean age 61 years) with venous leg ulcers (ulcer surface >5cm²; duration >3 months) were included in the study. The study excluded patients with arterial disease (ABPI<0.8), heart insufficiency with EF<35, pregnancy, cancer disease, rheumatoid arthritis and diabetes. Based on clinical opinion and available literature, the following were considered as potential risk factors: sex, age (years), ulceration surface (cm²), time since ulcer onset (months), previous operations (stripping, SEPS), history of deep vein thrombosis, body mass index (BMI), microbiological status of the wound, reduction in calf circumference, walking distance during the day, calf: ankle circumference ratio <1.3, fixed ankle joint, ulcer recurrence, number of wounds, history of wound debridement, >50% of wound covered with fibrin, lipodermatosclerosis, depth of the wound >1.5cm.

Results: Within 52 weeks of limb-compression therapy, 24 (12.7%) venous ulcers had failed to heal. A small ulceration surface (< 20 cm²), the duration of the venous ulcer <12 months, a decrease in calf circumference of more than 2 cm during the first 50 days of treatment and emergence of new skin islets on the wound surface were favorable prognostic factors for ulcer healing. A large BMI (>35 kg/m²), short walking distance during the day (<200m), a history of wound debridement and ulcers with deepest presentation (>2cm) were indicators of slow healing. Calf: ankle circumference ratio <1.3, fixed ankle joint and reduced ankle range of motion (<20 degrees) were the only independent parameters associated with non-healing (P<0.01).

Conclusions: The results obtained in this study suggest that non healing venous ulcers are related to the impairment of the calf muscle pump.

11:00 am

36 Neovalue Construction In Deep Venous Incompetence: Comparison Between Two Subsequent Case Series and Related Technical Details

M. Lugli, S. Guerzoni, O. Maletti - Hesperia Hospital, Modena, Italy

Background: Deep venous incompetence, due to postthrombotic syndrome and primary valvular defects, is a main cause of severe chronic venous disorders, often resistant to conservative therapy. In selected cases deep venous surgery should be considered and when more consolidated techniques are not suitable, neovalue construction by parietal dissection can be performed. This technique was applied in two subsequent case series, which differ in surgical technical details after identifying one probable cause of valve failure in the first group.

Methods: From December 2000 to June 2007 we performed 40 neovalue construction operations in 36 patients (19 males, 17 females, median age 57, range 29 - 82) affected by deep venous insufficiency. 32 patients were affected by post thrombotic syndrome and 4 by valve agenesis. The 32 patients with post-thrombotic syndrome were selected from among 76 with resistant ulcers classified C 6,S E S A S,D,P P R,RO and the 4 patients with valve agenesis were selected within 28 affected by resistant ulcers classified as C 6,S E P A S,D,P P R. The patients were subdivided into 2 groups: the first included 19 operations performed in the period from December 2000 and December 2004, presenting a mean follow up of 57 months (range 31-78) and the second group included 21 patients from January 2005 to June 2007 with a mean follow up of 11 months (range 2-29). In the second group a surgical variation was applied in order to prevent flap collapse and improve neovalue competence. The principal technical variation consists in a modification of the flap principally by performing a fixation of it in the semi-open position. Postoperative venography was performed in all cases.

Results: In the first series ulcer healing was observed in 16 cases out of 19 (84%). Recurrent ulcers were observed in one case after three years. The valvular continence was found in 13 out of 19 (68%). Regarding the second series, continence was obtained in all cases. The ulcer didn't heal in one case (4.8%) and recurred in two cases (9.5%). Postoperative deep venous thrombosis was observed in 3 patients in the first series and was not detected in the second. Mortality rate was 0 and pulmonary embolism was not detected in both groups.

Conclusions: The modified technique applied to the second group seemed to improve the valve continence significantly. However a longer period of follow up for this latter group is required to validate this technical enhancement.

11:30 am

D. EUGENE STRANDNESS MEMORIAL LECTURE

Introduced by: Mark H. Meissner, MD

12:30 – 1:30 pm

INDUSTRY SPONSORED LUNCHEON

ClosureFAST™ Clinical Trials Update

By: VNUS Medical Technologies

- 1) *Prospective, multicenter 1 year follow-up*
- 2) *Randomized trial comparing ClosureFAST to endovenous laser*
- 3) *Lessons learned 1 year post launch*

1:30 pm

ASK THE EXPERTS: PELVIC CONGESTION SYNDROME

Moderator: Chieh Min Fan, MD

Educational Objectives:

1. *Review anatomy and techniques for imaging the venous structures of the pelvis and retroperitoneum.*
2. *Recognize the clinical manifestations of pelvic venous congestion*
3. *Understand endovascular and surgical treatment approaches for pelvic venous congestion syndromes*
4. *Review classification, clinical patterns, and treatment approach for pelvic vascular anomalies*

Anatomy and Imaging of the Venous System of the Pelvis and Retroperitoneum

Chieh Min Fan, MD, Brigham and Women's Hospital, Boston, MA

Pelvic Congestion Syndrome: Diagnosis and Management

Anthony C. Venbrux, MD, George Washington U. Hospital, Washington, DC

Nutcracker Syndromes: Endovascular and Surgical Management

Matthew Menard, MD, Brigham and Women's Hospital, Boston, MA

Vascular Anomalies: An Uncommon Cause of Pelvic Venous Congestion

Patricia Burrows, MD, St. Lukes – Roosevelt Hospital Center, New York, NY

2:30 pm

Coffee Break / Visit Exhibits

HOW TO SESSION

Recanalization and Re-Endovenous Ablation; Mapping Out My Veins Tips and Tricks; Sclero the Do's and Don'ts

Moderator: Julianne Stoughton, MD

Educational Objectives:

- 1. Attendees will become familiar with many of the common, and some of the unusual (but important) patterns of venous anatomy*
- 2. There will be a discussion involving the approach to incompetent perforating veins: reviewing the treatment options, the technical aspects of each treatment, as well as a discussion of which veins are best treated with which technology*
- 3. Recanalization, neovascularization and recurrent veins after venous intervention and will be discussed. The approaches will be illustrated with case presentations*
- 4. Difficult management cases will be presented including: the hypercoagulable patient, the obese patient, patients with anomalous anatomy, etc.*

Endovenous Heat Induced Thrombosis: When To, How To and What To Look For

Lowell Kabnick, MD

Treatment of Incompetent Perforators

Steve Elias, MD

Treatment of Neovascularization and Recanalized Veins

Ronald Bush, MD

MODERATED POSTER SESSION

Moderator: Michael Dalsing, MD
Frank Padberg, MD
Bo Eklof, MD

Educational Objectives: The participants in the poster session will gain a wide range of knowledge expansion including chronic venous disorder, saphenous vein treatment, understanding risk factors and evaluation methods.

P-1 Microparticles: A Natural History Time Course Analysis In A Model of Murine Venous Thrombosis

A. E. Hawley, D. M. Farris, N. E. Ballard, A. P. McDonald, S. K. Wroblewski, P. K. Henke, D. D. Myers, T. W. Wakefield - University of Michigan, Ann Arbor, MI

Background: Deep venous thrombosis remains a significant health care problem. Recent studies suggest that procoagulant microparticle (MP) formation plays an integral part in the inflammatory component of venous thrombosis, leading to thrombus amplification. Low levels of MPs are found circulating in a normal physiological state and have been shown to increase with disease. The purpose of this study was to document a detailed time-course analysis of MPs after the initiation of venous thrombosis, and to assess associated tissue factor (TF) expression.

Methods: Inferior vena cava (IVC) ligation was performed on C57BL/6 mice (n65) utilizing an established model of IVC occlusion. Animals were sacrificed, post ligation, at the following time points (90sec, 15min, 30min, 60min, 90min, 2hour, 3hour, 1day, 2day) to assess MP production and thrombus mass. Approximately 500 μ L of anti-coagulated blood was used to obtain platelet poor plasma (PPP). The PPP was centrifuged and the pelleted MPs measured by flow cytometry (Becton Dickinson FACS Calibur with Cell Quest software). MPs were stained which identified them as originating from either leukocytes (MP-leu) or platelets (MP-plt). An additional MP pellet, pooled from 2day animals (n40), was evaluated at varying concentrations for TF procoagulant activity by chromogenic assay.

Results: MPs-leu and MPs-plt were significantly decreased vs. True Controls (TC) at 3hour. On Day 2, MPs-leu showed a significant increase while MPs-plt remained decreased significantly vs. TC (Figure 1). Thrombus mass correlated positively with MPs-leu, and negatively with MPs-plt (Table 1). TF bearing MPs showed a direct relationship to MP concentrations ($R=0.99$). Animals with IVC occlusion, but no clot, averaged 40% less TF (Table 2).

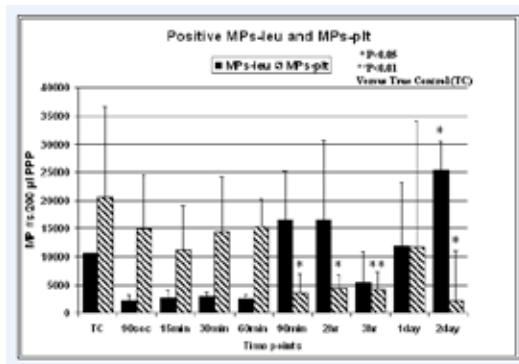
Conclusions: MPs tend to decrease after thrombosis. However, those from leukocyte origin increase significantly by day 2, while those from platelet origin remain depressed, likely from consumption into the thrombus. Thrombosis correlates positively with MPs from leukocyte origin. Additionally, MPs demonstrate a highly significant positive correlation with TF activity. This study suggests that knowing the time course and origin of MPs is important to understanding their biology and their potential use as a diagnostic technique.

Table 1:

Groups	Average IVC/Thrombus Mass (grams/cm)
True Controls 90sec	.0045 .0046
15min 30min	.0061 .0053
60min 90min	.0041 .0063
2hour 3hour	.0077 .0154
1day 2day	.0179 .0256
R=0.65(Mass vs. Mps-leu)	R=-0.59(Mass vs. Mps-plt)

Table 2:

Tissue Factor Activity of Microparticles	
# of MPs	pM TF avg.
10000	13.7
25000	40.5
50000	75.9
80000	124.3
160000	205.2
No clot 80000	64.6
No clot 160000	144



P-2 Popliteal Vein Compression Syndrome: Obesity, Venous Disease and the Popliteal Connection

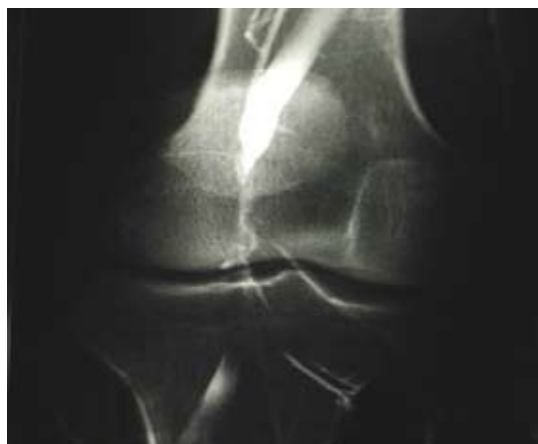
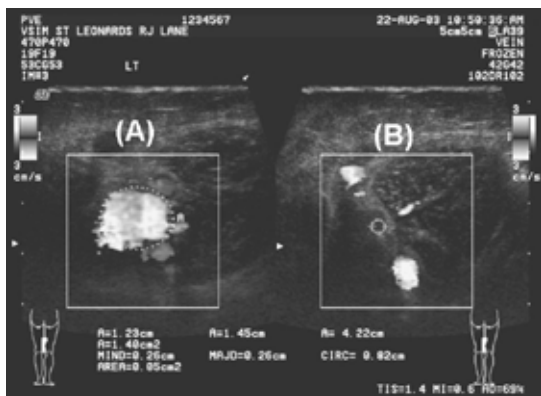
R. J. Lane¹, M. L. Cuzilla² - ¹Royal North Shore Hospital, Sydney, Australia ²Vascular Surgery Investigations and Management, Sydney, Australia

Background: Obesity and venous disease are commonly encountered together. The aetiological relationship however has not been clear. Popliteal venous compression (PVC) has been encountered both on ultrasound and venographically. In this study, patients with symptoms and/or signs of chronic venous hypertension with PVC were investigated and the relationship to obesity defined. Popliteal Vein Compression Syndrome (PVCS) is defined herewith in its pathological state.

Methods: Colour duplex ultrasound (CDU) was used to measure the maximum internal diameter (ID) of the popliteal vein (POPV) with the knee locked and unlocked. A total of 89 patients were included in the study of which 49 limbs were classified as having PVC as determined by colour duplex ultrasound. A positive finding was defined as a greater than 90% reduction in the maximum internal diameter (ID) of the POPV with knee locking. Forty consecutive limbs with venous disease with no evidence PVC were used as controls. The Body Mass Index (BMI) of each group was calculated and the clinical symptoms and signs were documented. After failed conservative treatment, 30 of the 49 underwent open popliteal decompression.

Results: Patients with PVC were found to have a BMI of 36.0 ± 6.2 compared with the controls of 25.3 ± 3.0 . The POPV ID in the PVC group before and after knee locking changed from 11.7 ± 5.0 mm to 1.0 ± 2.1 mm respectively. Post-operatively, the POPV ID before and after knee-locking changed from 10.2 ± 2.2 mm to 9.0 ± 1.5 mm respectively. At 16.2 \pm 12.1 months follow-up, all the major clinical parameters including pain, oedema, pigmentation and lipodermatosclerosis plus the total clinical score were all improved at a statistically significant level.

Conclusions: There appears to be a relationship between obesity, chronic venous disease and PVC. Popliteal vein compression syndrome may clarify the previously unexplained venous presentations, including worsening following ablative venous procedures, and perhaps the known association with deep vein thrombosis and obesity. Surgical decompression provides gratifying results in patients unresponsive to conservative treatment.



P-3 Ultrasonic Venous Valve Imaging - A Prerequisite For Exostent Repair

R. J. Lane¹, M. N. Phillips², M. L. Cuzilla³ - ¹Royal North Shore Hospital, Sydney, Australia; ²AllVascular Pty Ltd, Sydney, Australia; ³Vascular Surgery Investigations and Management, Sydney, Australia

Background: Lower limb venous disease remains a significant problem in our community today. The condition has been treated mainly with ablative procedures such as stripping and or sclerotherapy. The aim of this study was to define the ultrasonic features of repairable venous valves by External Valvular Stenting (EVS). In addition, to access the ability to predict success of EVS determined intra-operatively and at three-months post-operatively.

Methods: Valves considered for EVS were assessed with Brightness-Mode (B-Mode), Spectral Pulsed Doppler (PD), Colour Doppler Imaging (CDI) and Brightness-Flow (B-Flow).

The ultrasonic features of the great saphenous vein (GSV), terminal valve (TV) and sub-terminal valves (STV) were considered. Inclusion criteria were; valvular ring dilation <12mm in diameter, (GSV) internal diameter (ID) <12mm along the entire length of the trunk, symmetry of the valve sinuses, positive identification of two valve cusps, and symmetrical reflux flow patterns through the incompetent valve. There were 69 limbs included in the study. All repaired TV's were tested intra-operatively for competence after application of the EVS. If there was evidence of residual reflux, the STV was also repaired. The operated limbs were assessed clinically 3 months after the procedure at which time ultrasound was also used to test the repaired valves.

Results: Of the 69 TV's that were examined pre-operatively, a total of 50 were considered repairable by ultrasonic features (72%). At operation, 44 of these valves were successfully repaired (88%). In the 6 limbs which had residual TV reflux, the STV was repaired. All 6 had competence in the GSV trunk following the STV EVS. Of the 19 TV's that were considered by ultrasonic features to be unreparable, 18 had gross reflux following EVS with 1 only repaired being successful. All limbs that were successfully repaired at operation were followed up 3 months later, and re-examined with diagnostic ultrasound. Of this group; 3 GSVs had residual reflux at the TV and STV, 1 GSV had major reflux and 1 GSV developed thrombophlebitis. The overall figures for the predictability of successful EVS based on ultrasonic features of the valve were; sensitivity 97.8% (95% CI, 88.2 - 99.6), specificity 75% (95% CI 53.3 - 90.2) and accuracy 90.4%.

Conclusions: In the treatment of varicose veins, a combination of ultrasound modalities accurately predicts EVS outcomes at the TV and STV of the GSV.

P-4 Prevalence and Distribution of Deep Vein Thrombosis In Patients With Symptomatic Pulmonary Embolism

T. Yamaki¹, M. Nozaki¹, H. Sakurai¹, M. Takeuchi², K. Soejima³, T. Kono¹ - ¹Tokyo Women's Medical University, Tokyo, Japan; ²Nihon University, Tokyo, Japan; ³Tokyo Metropolitan Hiroo General Hospital, Tokyo, Japan

Background: To investigate the prevalence and distribution of deep vein thrombosis (DVT) in patients with symptomatic pulmonary embolism (PE), and to compare characteristics between patients with PE and these without PE.

Methods: A total of 420 consecutive patients with DVT were included. The distribution of DVT was evaluated with duplex scanning, and patients with clinical suspicion of PE were investigated using ventilation/perfusion lung scintigraphy. The patients were then followed for 6 months for investigation of recurrence of venous thromboembolism (VTE) and outcome.

Results: PE was found in 82 (20%) patients. There were no significant differences in mean age, gender, risk factors for VTE, and laterality of leg involvement between patients with DVT and PE and these with DVT alone. On the other hand, the proportion of leg symptoms was statistically higher in patients with DVT alone ($p=0.0002$). The most common venous segment containing thrombosis was SV in both groups (57% and 50%, respectively, $p=0.254$). However, there was a significantly higher proportion of distal DVT in patients with DVT and PE ($p<0.0001$). The significantly higher proportion of DVT was found in gastrocnemius vein in patients with DVT and PE ($p=0.018$). In contrast, the proportion of common femoral vein thrombosis was found to be significantly higher in patients who had DVT alone ($p=0.049$). There were similar tendencies in the proportions of distinguished risk factors for patients with DVT alone. There was a significant higher proportion of recurrent VTE and mortality rate in patients with DVT and PE. ($p<0.0001$ and $p=0.0042$, respectively). In patients with DVT and PE, there was no significant difference in the cumulative proportion of overall survival rate between the patients with proximal DVT and these with distal DVT ($p=0.600$).

Conclusions: The lower extremity venous duplex scanning demonstrates that distal DVT is more predominant in patients who had PE compared to these with DVT alone. Recurrent VTE is more often found in patients with DVT and PE. Mortality rate is much worse in patients with DVT and PE. However, overall survival rate appears to be similar between PE patient with proximal DVT and these with distal DVT. Although, there are similar tendencies in age, gender, laterality of leg involvement, and risk factors for VTE between patients with DVT and PE and these with DVT alone, these two diseases appear to be distinct with different distribution of DVT and natural history.

P-5 Endovenous Laser Therapy In the Treatment of Short Saphenous Varicose Veins: A Non-Randomised Controlled Trial

A. Mekako, J. Hatfield, S. Gulati, M. Abdul Rahman, P. T. McCollum, I. C. Chetter - Hull Royal Infirmary/University of Hull, Hull, United Kingdom

Background: Endovenous laser therapy (EVLT) is a safe and effective treatment modality for varicose veins on short-to-medium term follow-up. Reports on EVLT have largely focussed on varicosities affecting the greater saphenous vein. This study compares EVLT with surgery in the treatment of short saphenous varicose veins.

Methods: Two non-randomised groups were studied. EVLT (14W continuous): 22 patients, median age 48 (IQR 43-56) years, and surgery (sapheno-popliteal junction ligation +/- strip and avulsions): 18 patients, median age 48 (IQR 30-57) years. Patients were assessed at 1, 6, and 12 weeks post-procedure. Pain scores, venous clinical severity scores (VCSS), abolition of reflux, return to work /normal activities, patient satisfaction, as well as quality of life (QoL) outcomes were analysed.

Results: Baseline parameters were similar. Visual Analogue Scale-rated mean pain scores were significantly lower following EVLT during the first week (1.3 versus 3.2; $p=0.003$). There were no significant differences in VCSS, return to work /normal activities, abolition of reflux, and patient satisfaction at 12 weeks. The EVLT group had significantly lower mean Aberdeen Varicose Vein Scores at 1 week (15.45 versus 20.29; $p=0.01$), but no differences at 6 and 12 weeks. There were no differences in SF-36 domain scores, except at 6 weeks (better social functioning following EVLT: 84 versus 74; $p=0.04$).

Conclusion: This study has demonstrated some benefits of EVLT over surgery in the early post-operative period, although outcomes were largely similar in both groups. This may suggest equivalence of both treatment modalities, but a randomised trial is indicated to elucidate longer-term clinical and QoL outcomes.

P-6 Greater Saphenous Vein Diameter Predicts Venous Reflux

J. Bloom, F. C. Vandy, S. Brown, A. Clay, C. Lane, G. Reynolds, S. LeBaron, C. Nighswander, P. K. Henke, T. W. Wakefield - University of Michigan, Ann Arbor, MI

Background: Current literature has demonstrated a positive correlation with venous diameter and increased valve closure time suggesting reflux. Specifically, this has been shown for perforating veins. However, this association has not been demonstrated for the greater saphenous vein (GSV). This study investigated whether such a relationship exists between valve closure time and vein diameter.

Methods: A random subset of 135 patients (188 limbs) from our endovascular laser therapy (EVL) registry had undergone a venous reflux study. Patients were placed in reverse Trendelenburg and evaluated for venous incompetence as measured by valve closure time in msec. GSV diameter was measured at the saphenofemoral junction and reflux measurements were obtained 2 centimeters distal to the valve with the Doppler probe in the sagittal position and parallel to the vessel wall. Valve closure time in the common femoral and greater saphenous veins was recorded following a Valsalva maneuver. However, valve closure in the popliteal vein was obtained with a distal thigh compression. GSV diameter was compared to venous valve closure time using one-way analysis of variance (ANOVA). Post-hoc analysis was done using a Bonferroni's correction.

Results: Valve closure times were categorized corresponding to the degree of reflux. (Table 1) A valve closure time indicative of moderate reflux was statistically longer than that of mild reflux. ($p = .002$) There was no statistical difference in valve closure time between normal and mild or moderate and severe. A 2-tailed independent t-test revealed the GSV diameter of a combination moderate and severe group to be significantly larger than a combination mild and normal group. (Table 2) There was no statistical association between GSV diameter and valve closure time in the popliteal or common femoral veins.

Conclusions: Although we did not identify difference between every classification of reflux, there was a statistical difference between mild and moderate classes. A simplified analysis comparing our combined normal and mild groups to our combined moderate and severe groups demonstrates a direct relationship with GSV diameter and reflux time. Our data as well as our clinical observations suggest diameters greater than .795 centimeters are associated with a moderate to severe degree of reflux. These results call into question the clinical significance of a small GSV diameter in the presence of a moderate to severe reflux.

	N=	% female	% right leg	GSV diameter	Std. Dev	95% CI
Classification						
Normal (0-1000 msec)	11% (21)	71% (15)	47% (7)	0.6695 cm	0.22128	0.5688-0.7702
Mild (1001-2000 msec)	20%(37)	76% (28)	54% (20)	0.6616 cm	0.18986	0.5983-0.7249
Moderate (2001-3000 msec)	31% (58)	67% (39)	53 (31)	0.8712 cm	0.34574	0.7803-0.9621
Severe (>3000 msec)	38% (72)	74% (53)	42% (30)	0.8224 cm	0.2403	0.7659-0.8788

	N=	GSV diameter	Std. Dev	95% CI	
Classification					
Normal and Mild	58	0.664 cm	0.200	0.612-0.717	
Moderate and Severe	130	0.847 cm	0.293	0.795-0.898	p = 0.000

P-7 Combined Intermittent Pneumatic Leg Compression and Pharmacological Prophylaxis For Prevention of Venous Thromboembolism In High Risk Patients

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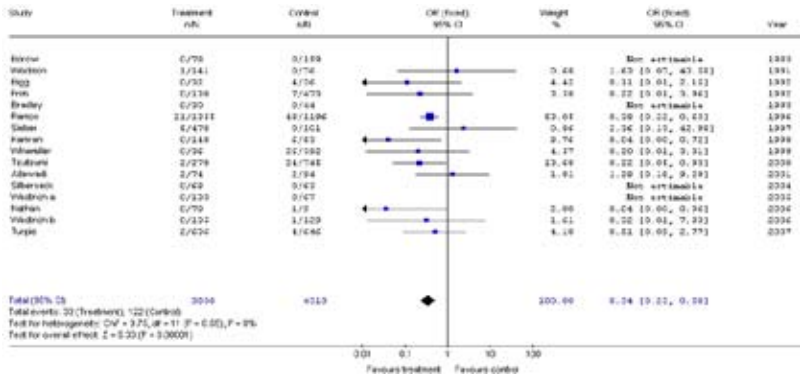
Background: It has been suggested that combined modalities are more effective than single modalities in preventing venous thromboembolism in high risk patients. The aim of the present study was to perform a meta-analysis on the efficacy of intermittent pneumatic leg compression combined with pharmacological prophylaxis versus single modalities (intermittent pneumatic leg compression or pharmacological prophylaxis) in preventing venous thromboembolism in high-risk patients.

Methods: Using MEDLINE search and the reference lists of relevant articles to identify additional trials, studies that used combined intermittent pneumatic leg compression and pharmacological interventions to prevent venous thromboembolism in high-risk patients were identified.

Results: Seventeen studies, six of them randomized controlled trials (RCTs), which enrolled 9,998 patients in total in a variety of specialties, including orthopedic, general and cardiac surgery, were identified. Five RCTs evaluated the role of combined modalities on the incidence of symptomatic PE. These showed a reduction in PE from 2.51% (53/2110) in the control group (single modalities) to 1.03% (24/2335) in the treatment group. Relative risk was 0.41, 95% confidence interval (CI) was 0.25 to 0.65. Results did not demonstrate heterogeneity or publication bias (I²=0%). Five RCTs investigated the role of combined modalities on the incidence of DVT. These showed a reduction in DVT from 4.79% (87/1816) in the control group to 2.29% (43/1881) in the treatment group. RR was 0.43, 95% CI 0.30 to 0.61. Results were consistent with significant heterogeneity (I²=66.2%).

Repeat analysis that included all studies revealed similar results. Sixteen of the included studies evaluated the role of combined modalities on the incidence of symptomatic PE. These showed a reduction in symptomatic PE from 2.83% (122/4313) in the control group to 0.86% (33/3838) in the treatment group (Figure). Odds ratio was 0.34, 95% CI 0.23 to 0.50. Results did not demonstrate heterogeneity or publication bias (I²=0%). Fourteen studies investigated the role of combined modalities on the incidence of DVT. These showed a reduction in DVT from 6.18% (200/3238) in the control group to 2.05% (63/3074) in the treatment group. Odds ratio was 0.31, 95% CI 0.23 to 0.43. Results were consistent with significant heterogeneity (I²=53.5%).

Conclusions: Combined prophylactic modalities decrease significantly the incidence of venous thromboembolism, both DVT and PE compared to single modalities. The results of the current review support their use, especially in high risk patients.



P-8 Evaluation of Venous Thromboembolism Prophylaxis In Randomly Selected Medical and Surgical Patients

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Background: The evidence to support the use of pharmacologic prophylaxis to prevent venous thromboembolism (VTE) has been available for years, yet VTE remains a problem in hospitalized patients. The purpose of this study was to evaluate the utilization of VTE prophylaxis in randomly selected 200 medical and surgical adult inpatients prior to the implementation of a VTE Safety Toolkit.

Methods: This study was a part of a larger pre/post study to implement a VTE Safety Toolkit that consists of clinical algorithms for the prevention, diagnosis, and management of VTE. We randomly selected 100 medical inpatients and 100 surgical inpatients at an academic medical center. Retrospective medical chart reviews of those 200 inpatients were conducted during the pre-intervention period.

Results: Of the 100 randomized medical inpatients, 47 were placed on anticoagulation prophylaxis only or anticoagulation and mechanical prophylaxis. Of these 47, 13 were on chronic warfarin therapy which means that they were already anticoagulated and therefore, did not need further prophylaxis to prevent VTE. Seven patients were ineligible for anticoagulation due to a contraindications, thus, 47 of 93 (51%) eligible patients received appropriate therapy, whereas 46 of 93 patients (49%) were not appropriately anticoagulated to prevent VTE. Only 49 surgical inpatients received pharmacological prophylaxis either anticoagulation alone or anticoagulation with mechanical prophylaxis. Eight of 28 patients (29%) were considered to be at moderate risk for VTE, 18 of 38 patients (47%) were categorized to be at high risk and 23 of 30 patients (77%) at the highest risk received pharmacological prophylaxis. Five were ineligible for prophylactic anticoagulants due to documented contraindications, such as bleeding and coagulopathies. Of the 51 surgical inpatients who did not receive pharmacological prophylaxis, 42 patients (82%) received mechanical prophylaxis. Nine patients who had major surgery did not receive any form of VTE prophylaxis.

Conclusions: Using the American College of Chest Physicians recommendations for VTE prophylaxis as the gold standard we reviewed 200 cases to determine VTE risk categories, eligibility for prophylaxis, and contraindications to anticoagulation. Approximately half of all eligible medical and surgical inpatients did not receive the appropriate protection against VTE. The dosing and timing of anticoagulation prophylaxis needs to be determined in future studies to explain the high number of VTE cases found in the patients that had been placed on anticoagulants. The VTE Safety Toolkit will be implemented in October 2007 and data will be collected 6 months following the implementation. Our goal is to increase the number of patients who are assessed for VTE and appropriately prophylaxed using institutional guidelines and organizational supports.

P-9 An Algorithm For Outpatient Deep Venous Thrombosis Management and Severe Post-Thrombotic Syndrome At Mid-Term Follow-Up

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Background: An outpatient treatment algorithm according to all etiology groups of deep venous thrombosis (DVT) was adapted. Evaluation of initial DVT treatment as well as mid-term follow-up results of severe post-thrombotic syndrome (PTS) after mean two years according to CEAP classification is reported.

Methods: Patients with acute, symptomatic, lower extremity DVT were sub-grouped into transient risk and hypercoagulability due to the designed algorithm. Initial treatment: after diagnosis a subcutaneous low-molecular-weight heparin (LMWH) (enoxaparine sodium 150 IU/kg/day), on second day an oral anticoagulant (Warfarine Na 5mg/day). Patients were equipped with Class-II below-knee compression stockings (Sigvaris-212) and sent home. Follow-up visits: 1, 3, 6 and 12th month. CEAP classification was assessed to determine chronic venous disease and severe PTS at late follow-up.

Results: Records of 121 acute DVT cases treated according to the algorithm at 2000 - 2004 were analysed. There were 3 recurrences, 1 major bleeding, 1 minor bleeding in transient risk group (n=71); 8 recurrences, 4 major bleeding, 3 minor bleeding and 3 pulmonary emboli in hypercoagulability group (n=50) after 12 months of initial treatment (Table 1). There was a significant difference regarding recurrent DVT ($0.02 < p < 0.05$), hypercoagulability group was associated with a three-fold increased risk for recurrent DVT (RR=3.79, 95% CI 12.30-159.17). CEAP classification was assessed on 10 patients from transient risk and 30 patients from hypercoagulability group (mean 25 ± 12.22 months) in mid-term follow-up (Table 2). Severe PTS (C- 4s, 5s, 6s) developed in 4 patients (10 %); all belonged to hypercoagulability group and all had a recurrent DVT with inadequate INR on presentation during study interval.

Conclusions: Thrombophilia investigation using an algorithm is a helpful adjunct to sub-classify patients, as well as guide therapy. Hypercoagulability is associated with a three-fold increased risk for recurrent DVT. CEAP outcomes after two years indicate relatively good PTS outcomes. Severe PTS was associated with hypercoagulability and recurrent DVT.

TABLES

Table 1. Results of initial treatment (n=121)

	Transient risk group	Hypercoagulability Risk Group		
		Weak thrombophilia group	Idiopathic group	Strong thrombophilia group
	(n=71)	(n=20)	(n=10)	(n=20)
Recurrent DVT	3	2	1	5
P.E.	0	1	0	2
Major bleeding	1	1	1	2
Minor bleeding	0	1	1	1

Table 2. CEAP classification - subgroups of all etiologies

	Transient Risk (n=10)	Hypercoagulability Risk (n=30)		
		Weak Thrombophilia (n= 10)	Idiopathic (n=5)	Strong Thrombophilia (n=15)
C-0as	3	2	1	2
C-0s	1		2	2
C-1as		1		
C-1s		1		
C-2as	1	2		
C-2s	3			1
C-3as		2		2
C-3s	2	2		5
C-4as				1
C-4s			1	1
C-5s			1	
C-6s				1

P-10 Prevalence of Isolated (C2) and Complicated (C2+) Varicose Veins Among Patients Consulting Vascular Specialists For Varicosis: A Snapshot

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Background: The revised CEAP classification allowed to differentiate isolated varicose veins (C2) and complicated varicose veins (C2,3, C2,3,4 or C2,4 or C2,3,4,5¼). The main objective of this study was to identify with this revised classification the prevalence of isolated varicose veins (C2) and complicated (C2+) among patients consulting vascular specialists and to compare their symptomatic expression and the data issued from the detailed CEAP concerning Anatomy (A), Etiology (E), Physiopathology (P).

Methods: European cross sectional study conducted in european countries and involving ten study centres per countries. Each centre (Phlebologist, angiologist or vascular surgeons) were asked to include the next 10 patients consulting for varicose veins and to achieve a full completion of the clinical and duplex examination required by the advanced CEAP for each leg. Exclusion criteria were patients with CVD without any varicose veins and patients with acute deep venous thrombosis or superficial thrombophlebitis. Venous reflux was defined by a retrograde flow in the reverse direction to physiological flow lasting for more than 0,5 seconds in the superficial veins, except the femoropopliteal veins, where the cut off was set at 1.0 second.

Results: Current preliminary results covers 171 patients (100 French and 71 Italians) presenting 258 legs with varicose veins. They were 57 ± 15 years old, 71,6% were female and 36,5% are overweighted. C2 prevalence was 64,0% and C2+: 36,0% and strictly comparable between Italy (C2=63,3%) and France (C2=64,4%). Prevalence of C2 significantly differs between male and female : 49,3% vs 69,0% (p<0.001) and decreases according age (p<0.001). C2,C3 represents 11,2% of patients, C2,4 : 9,7%, C2,3,4 : 8,9%, C2,3,4,5 : 1,9% , C2,4,5 : 1,6% and those involving C6 : 2,4%. C2+ are more symptomatic than C2 : 74,2% vs 52,1% (p<0.0005). These previous results are similar in Italy and France. A secondary etiology is significantly more frequent in C2+ (17,2% vs 1,2% p<0.0001), deep vein are more often involved (16,1% vs 1,2% p<0.001) and the association of reflux and obstruction is more present (13,6% vs 1,9% p<0.0). After duplex examination, whatever the country, the average duration to fill in the grid of the advanced CEAP is 6,1 ± 3,8 mn.

Conclusions: Our study support the usefulness of the advanced CEAP by providing a description which better reflect the real venous status of patients which allows better comparison between epidemiological studies and its usability as ascending severity classes than in the previous CEAP version.

P-11 Prospective Randomized Efficacy of Ultrasound-Guided Foam Sclerotherapy Compared To Ultrasound-Guided Liquid Sclerotherapy In the Treatment of Symptomatic Venous Malformations

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Background: To compare the clinical outcome between ultrasound-guided foam sclerotherapy (UGFS) and ultrasound-guided liquid form sclerotherapy (UGLS) in patients with congenital venous malformations (CVM).

Methods: Eighty-nine patients with symptomatic CVM were treated with ultrasound-guided sclerotherapy. There were 22 males and 67 females with mean age of 14.5 years. The sclerosing agents used were 1% polidocanol (POL) or 10% ethanolamine oleate (EO). POL was injected predominantly into smaller, superficial lesions, whereas EO was used for large, deeper lesions. Foam sclerosing solution was provided using Tessari's method.

Post-sclerotherapy surveillance was done at 6 months after last session using duplex ultrasound. Findings obtained by duplex scanning were divided into 4 groups:

Disappeared: The venous space was occluded and was totally shrunk

Partially recanalized: The venous space was partially recanalized and was partially shrunk

Totally recanalized: The venous space was totally recanalized and returned at the same size

Worsened: The venous space was totally recanalized and became worsened.

Results: Forty-nine patients were treated with UGFS and remaining 40 were treated with UGLS. The most common location of VM in UGFS was head and neck region, followed by upper extremity and lower extremity region (51%, 19%, and 14%, respectively). Similarly, in the UGLS group, head and neck was involved in 42% of the patients, 35% had lower extremity and 10% had upper extremity involvement. The amount of POL was significantly smaller in patients who were treated with UGFS ($p=0.022$). Similarly, there was a significant reduction in the use of EO in patients treated with UGFS ($p=0.005$). The proportion of CVM with total disappearance and partial recanalization was significantly higher in patients treated with UGFS ($p=0.002$). No major complications related to sclerotherapy were encountered in both groups.

Conclusions: These findings suggest that UGFS could have greater promise compared with UGLS in the treatment of CVM.

P-12 Elastic Stockings and Ulcer Treatment: What About Pressure and Stiffness?

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Background: Multilayer bandages are the basic method of choice for treating venous leg ulcers. They exert a high standing pressure (necessary to counteract venous hypertension) starting from a low and comfortable supine pressure: this high difference between standing and supine pressure corresponds to a high stiffness. Elastic stockings produce lower pressure and stiffness when compared with multilayer bandages and have a lower recommendation grade for ulcer treatment.

Aim: To compare maintenance of pressure over time and elastic properties of three compression devices by in vivo-measurements in order to evaluate an optimal compression system for the treatment of venous leg ulcers.

Methods: In 12 healthy volunteers two kinds of stockings were tested: a two-layer Gloriamed ulcer Kit®, consisting of a liner (24 mm Hg) and a Gloria 261® natural rubber stocking (23-32 mmHg), and a single Gloria 261®. Interface pressure was measured in supine and standing position and the Static Stiffness Index (SSI) was calculated by subtracting the supine from the standing pressure. Thereafter the volunteers were asked to wear the ulcer kit for one week taking off the outer layer over night. The pressure and stiffness data were compared with those measured in 12 patients suffering from venous leg ulcers and treated by means of an inelastic bandage system (Rosidal Sys®) with high pressure and stiffness.

Results: The mean pressure values (mm Hg) in the supine and standing position were 28.3 ± 4.0 and 35.3 ± 5.4 for the stocking, 45.8 ± 5.8 and 55.2 ± 5.1 for the ulcer kit, 69.5 ± 5.8 and 94.8 ± 10 for the bandage system. Differences are statistically significant between all the compression devices.

The corresponding SSI values were 6.9 ± 2.4 (stocking), 9.3 ± 4 (ulcer kit) and 25.3 ± 6.1 (Rosidal Sys®). After 48-72 hours the pressure loss in the supine and standing position was 6.1% and 5.4 % with the ulcer kit, but 42.1% and 36,1% with the bandage system ($p < 0.001$) so that the pressure range of the bandage system came close to that of the ulcer-kit.

Conclusions: The ulcer-kit achieves a standing and working pressure similar to that exerted by multilayer bandages, at least after some days when there is a considerable pressure loss of the bandage system. Since the outer layer is removed over night the resting pressure of the liner keeping the ulcer dressing in place is well tolerated.

This new stocking system can be recommended at least for "not complicated" ulcers with a surface less than 100 cm² and lasting less than 1 year.

P-13 Inelastic Compression Increases Venous Ejection Fraction More Than Elastic Bandages

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Background: One of the pathophysiological key-parameters of an incompetent venous pump is the reduced ejection fraction (EF) from the lower leg. The aim of our work was to investigate if compression therapy is able to increase EF in patients with chronic venous insufficiency and if there is any difference between elastic and inelastic bandages.

Methods: EF was measured by means of strain gauge plethysmography in 14 healthy subjects (coefficient of variation $6.5\% \pm 2.4$) and in 20 patients (CEAP C2-C6) waiting for venous surgery. The probe was placed 5 cm distal to the patella in supine position. After calibration, the examined leg was elevated to empty the calf veins and then the patient was asked to stand up and wait until a stable signal was achieved. The resulting volume increase after refilling of the veins is defined as venous volume (VV). Then the patient was asked to perform 20 standardized steps in 20 seconds. The resulting volume decrease corresponds to the ejected volume (EV) and ejection fraction is calculated according to the formula $EF = EV/VV \times 100$. The procedure was repeated with an elastic and an inelastic bandage on the leg applied with the same resting pressure distally to the strain gauge. The interface pressure of each bandage was measured about 12 cm above the inner ankle using an air-filled pressure transducer in supine and standing position.

Results: With the same resting pressure of about 40 mm Hg, the standing pressure raised by 4.9 ± 2.0 mm Hg with an elastic and by 18.7 ± 4.3 mm Hg ($P < .001$) with an inelastic bandage. EF increased from $36.4\% \pm 10.2$ (baseline) to $48.2\% \pm 10.7$ with the elastic and to $62.3\% \pm 8.1$ ($P < .001$) with the inelastic bandage, coming close to the normal range ($63.8\% \pm 2.4$). Standing pressure and the difference between systolic and diastolic pressure during exercise, both being higher with inelastic bandages, showed a significant correlation with EF ($r = .58$ and $r = .65$ respectively).

Conclusions: Ejection fraction which is severely reduced in venous insufficiency can be increased by compression therapy. Inelastic compression is much more effective than elastic bandages and is able nearly to normalize ejection fraction.

P-14 Arterial Revascularization and Compression Therapy In the Treatment of Mixed Arterial/Venous Leg Ulcers

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Background: Venous ulcers are a major health problem because of their high prevalence and associated high cost of care. The natural history of this disorder is slow healing and high recurrence rate. About 3%-5% of patients with venous ulcers have combined arterial and venous insufficiency. The aim of this study was to show the results in the treatment of mixed arterial/venous ulcers with and without compression therapy after performing arterial revascularization procedures.

Methods: A total of 27 patients (11 women and 16 men; mean age 65.7 years) with mixed arterial/venous ulcers were randomized into two groups: treatment group (14 patients) and control group (13 patients). All 27 patients had an active ulcer in the gaiter area (ulceration surface: 10-44 cm²; duration: 5 months - 4 years), deep vein reflux confirmed with color duplex scan and ankle brachial pressure index of 0.7 or less. Mean ankle brachial pressure index was preoperatively 0.53 and 0.49 in patients in the treatment group and 0.50 and 0.52 in patients in the control group). Arterial revascularization procedures were performed in all 27 patients included in the study (7 aortobifemoral, 12 above-knee femoropopliteal, 4 below-knee femoropopliteal and 4 femorotibial reconstructions). Thirty days after operation patients in the treatment group underwent compression treatment using multi-layer bandaging system while patients in the control group didn't receive any additional treatment. The results in the treatment of ulcers in these two groups were analyzed in terms of healing rate, time for healing and recurrence rate during the one year follow-up period. Primary endpoint of the study was complete ulcer healing at 24 weeks. After ulcer healing, patients in the treatment group wear compression stockings class II (25mm Hg) in order to avoid recurrence. The study excluded patients with heart insufficiency (EF<35), pregnancy, cancer, rheumatoid disease and diabetes. Patients with foot or/and finger ulcers were also excluded from the study.

Results: Postoperative mean ankle brachial pressure index was 0.85 and 0.84 in patients in the treatment group and 0.86 and 0.92 in patients in the control group. The healing rate was 71.4% (10/14) in the treatment group, and 38.5% (5/13) in the control group ($p<0.01$). Median ulcer healing time was 68 days (27-141 days) in the treatment group versus 89 days (41-146 days) in the control group ($p<0.05$). The recurrence rate during the one year follow up period was 40% (4/10) in the treatment group and 40% (2/5) in the control group.

Conclusions: The study suggests that mixed arterial/venous ulcers could be successfully treated with compression therapy after performing arterial reconstructive procedures.

P-15 Morphological Changes On Varicose Vein Wall Corresponds To MMP/TIMP Alterations

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Background: Primary weakness of vein wall is widely accepted as aetiology of varicose vein and is ascribed to its changes in matrix composition. Proteases, especially Matrix Metalloproteases (MMPs), and its inhibitors, TIMPs, are important regulators of matrix turnover. It was hypothesised that alteration in these proteases causes matrix imbalance which will correspond to observed changes in morphology of vein wall. Vein wall thickness was considered as an index of morphological change.

Methods: Stripped varicose vein were collected from patients undergoing operation as proximal (groin end) and distal (knee end) segments. The wall thickness were measured from EVG stained sections, as distance between external elastic lamina and luminal endothelium. The segments were further subdivided as hypertrophic (>1000µm, wall thickness) and atrophic (<500µm) to study the extremes of changes. Sections were stained by immunohistochemistry using antibodies to MMP-2, MT1-MMP, TIMP-2 and TIMP-3. They were image analysed using AnalySIS software to quantify the expression of proteases. Vein segments were also assayed for MT1-MMP enzyme activity.

Results: The distal varicose vein wall were thinner (n= 24 pairs, median thickness 574µm) than proximal (766µm, p>0.07). Atrophic vein segments were predominantly from the distal end of varicose veins (38% to 8% in proximal).

TIMP-2 and TIMP-3 expression were increased in the thicker proximal segments compared to distal (4.34 versus 1.29% per hpf, p>0.06 and 0.94 versus 0.41%, p>0.39, respectively). In comparison, MT1-MMP activity was significantly increased in distal segments (2.78 versus 0.72pg/µm in proximal, p<0.04). TIMP-2 and TIMP-3 expressions were higher in hypertrophic segments compared to atrophic segments (4.34 versus 0.99%, p>0.05 and 1.65% versus 0.08%, p>0.10 respectively). The reverse was true of MT1-MMP (1.05 versus 1.90, p>0.97) and MMP-2 (0.95 versus 1.09%, p>0.85), both showing a higher expression in atrophic segments.

Conclusions: This internal comparison of proximal and distal varicose vein wall highlighted the link between vein wall thickness and expression of MMP and TIMP. The proximal vein wall which was found to be thicker, has a higher expression of protease inhibitors, TIMP-2 and TIMP-3, which inhibits matrix turnover. This favours deposition of matrix components like collagen, resulting in thickening of the vein wall. The reverse was true in distal segments, where a higher activity of protease MT1-MMP activity increases the matrix turnover, reducing matrix content and leading to thinning of the vein wall. This relationship was again reflected in hypertrophic and atrophic segments. This study was able to prove conclusively the link between altered protease expression and morphological changes. The focus of future studies should now shift to the possible triggers for such changes in varicose vein wall.

P-16 Lower Power Improves Clinical Outcome of the Endovenous Laser Treatment

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Background: Many controversies still remain as to best parameters of the endovenous laser treatment of varicose veins and to date there is no standardized energy delivery protocol. Based on our experimental laboratory study we performed retrospective clinical study of our patients operated on with endovenous laser during 4.5 year period.

Materials And Methods: 463 procedures in 430 patients were analysed. Post-operative follow-up was accomplished after 1 month, 6 months and yearly thereafter.

Cox regression analysis was used to detect factors influencing non-occlusion and early or late recanalisation of saphenous vein. Results were evaluated by comparison of CEAP clinical class pre- and post-operatively, by percentage of recanalizations and using Kaplan-Meier life-table method. Postoperative data were available during different time periods in 457 limbs (98.7%).

Results: Saphenous occlusion was verified in 446 limbs (96.3%) after 1 month, non-occlusion or early reopening was seen in 17 limbs (3.7 %) at this time. Totally, 40 non-occluded saphenous trunk veins were found during the whole follow-up period (1-54 months) which represents final occlusion rate of 91.36 %. Using Kaplan-Meier analysis, we reached 83 % occlusion rate during follow-up period up to 4.5 years. Mean clinical CEAP classification improved from 2.22 (before operation) to .24 (1 month after) and .48 (last visit).

Cox regression analysis selected 2 factors with statistical significance: body mass index ($p = .017$) and laser power ($p = .031$).

Cumulative rate of occlusions in 54 months horizon is significantly higher (86%) in patients with BMI < 25 compared to patients with overweight (63%), $p = .00032$.

When comparing the influence of laser power on quality of saphenous occlusion, threshold of 13W was set arbitrary based on median values in occluded and non-occluded cohorts and using Kaplan-Meier survival method, the results of treatment with power < 13W and > 13W were analysed. Using power values < 13W, results were significantly better (log-rank test: $p = .048$, Cox-Mantel test .02) compared to power values of 13 W or more. Median power in non-occluded veins was 14W while in occluded trunks 13W. This difference is statistically significant ($p = .0095$).

Conclusions: Present clinical study supports concept of "slow and gentle heating" during the endovenous diode laser treatment of varicose veins to achieve good immediate and late result. Based on our observations and their statistical analysis, we recommend lower or medium power settings (8 to 13 W) with slower pull-back speed of laser fibre (0.2 to 2 mm/sec) to achieve sufficient energy per centimeter of the vein and the optimal clinical outcome with minimal side-effects.

P-17 Effectiveness of Weight Loss On the Evolution of Chronic Venous Insufficiency (CVI) After Bariatric Surgery In Obese Patients

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Background: In patients with morbid obesity, surgical treatment is more effective than non surgical treatment for weight loss and control of some comorbid conditions (Maggard 2005).

CVI is a known complication in these patients and 2/3 of them have no venous reflux (Padberg 2003). Bariatric surgery (BS) corrects the complications of CVI in almost all patients with a Body Mass Index (BMI) > 40 (Sugarman 2001). The objective is to study the relationship between weight loss and CVI in obese patients (BMI > 30) after BS.

Methods: From a database of 758 obese patients examined before a BS (clinical and duplex ultrasound examination), patients with CVI (Ceap C3-C6) and a BMI > 30 were reviewed.

Results: Of the 758 patients, 57 (7.5%) met the criteria, 3 did not have a BS, 1 refused to be reviewed. 35 who had a BS, were reviewed (65%). Of the 35 reviewed patients : 30 were females and 5 males. Mean age was 45.74 +/-11 years. The distribution of CEAP clinical class was C6 (n=0), C5 (n= 1), C4a and b (n= 4 and 2), C3 (n= 28). A venous reflux was present in 36% patients. 60% wore a compression for one month. Mean BMI was before BS 47.72 +/- 9.05 and after BS 41.33 +/- 10. Mean weight loss was 32.13 +/- 17 kg. Mean period between BS and the review was 16.35 +/- 9 months. After BS, the outcome parameters were based on clinical signs : group I- no clinical improvement/aggravation, group II - clinical improvement (decrease of oedema, lipodermatosclerosis, or pigmentation), group III- disappearance of clinical signs. The distribution was : group I n = 5 patients, group II n = 13 patients, group III n = 17 patients Mean weight losses (kg) were in group I : 3 +/-7.1, group II : 34.9 +/- 3.9, group III : 36.9 +/- 3.5

There was a significant correlation between the importance of weight loss and the improvement of CVI (t-test of Student). The difference was very significant between the groups II and III and the group I (p< 0.0006). No difference on CVI evolution was found between the groups with and without compression.

A possible bias : 19 lost to follow up patients but there was no difference between the lost to follow up group and the reviewed group for BMI, weight, sex, age, distribution of CEAP and venous reflux.

Conclusion: In obese patients with CVI, weight loss after BS could be a major parameter of improvement of clinical signs of CVI.

P-18 One Year Follow-Up of Radiofrequency Segmental Thermal Ablation (RTFA) of Great Saphenous Veins

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Background: Radiofrequency segmental thermal ablation has been introduced recently and shown its feasibility in occlusion of incompetent great saphenous veins (GSVs).

Methods: N = 295 GSVs in 225 patients were treated by RTFA under local anesthesia in a prospective multicenter trial. Duplex-ultrasound control visits were performed after 3 days, 3, 6 and 12 months. Clinical data was obtained at the same time

Results: Of 225 patients n=166 (73.8%) were female with a mean age of 50.5 years [range 18 - 79]. All GSVs were treated per protocol with double cycle treatment at the first segment with an average length treated of 36.9 cm. Concomitantly performed procedures were phlebectomy in 164 legs (55.6%) and sclerotherapy in 38 legs (12.8%). During follow-up, one vessel was open at 3 days but occluded thereafter. Treatment failures or recanalizations of the once occluded GSVs were n = 1 of 284 at 3 months, n = 2 of 250 at 6 months and n = 1 of 111 at 12 months after the intervention. The corresponding occlusion rates calculated according to the method of Kaplan and Meier were 100%, 99.6%, 98.9% and 98.0%, respectively. Of n = 111 GSVs, which were followed for 1 year, inner diameters were measured with ultrasound 3cm distal to the sapheno-femoral junction (SFJ). N = 54 of these GSVs were sonographically not detectable after 1 year. Of the remaining n = 57 GSVs with a complete data set, the average diameter at 3 cm distal to the SFJ reduced from 5.3 ± 1.8 mm pre treatment to 4.3 ± 1.7 mm at 3 days, to 2.9 ± 1.0 mm at 6 months and to 2.4 ± 1.1 mm at 1 year after treatment. The average VCSS score improved from 3.9 ± 2.1 before treatment to 3.6 ± 1.2 at 3 days, to 1.1 ± 1.7 at 3 months, 0.4 ± 0.8 at 6 months and 0.5 ± 1.2 at 12 months thereafter. Presence of any pain in the treated limb improved from 58.6% before treatment to 25.2 %, 7.3%, 5.2% and 7.2% at the same follow-up intervals. Likewise, presence of leg swelling improved from 52.9% to 5.4%, 8.8%, 7.2% and 2.7%. Side effects noticed at any time during follow-up in the RSTA-treated area were ecchymosis (5.8%), paresthesia (3.4%), erythema (2.0%), skin pigmentation (2.0%), hematoma (1.4%) and phlebitis (1.0%).

Conclusion: RSTA showed a high success rate and durability of the once achieved occlusion of treated GSVs together with a moderate side-effect profile. A remarkable subsequent improvement of clinical symptoms was noted.

P-19 Elimination of Superficial Reflux With Or Without Subcutaneous Fasciotomy - The Impact On Deep Axial Reflux and ulcer Healing

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Background: Deep venous reflux (DAVR), without history or Duplex ultrasound evidence of previous deep vein thrombosis (DVT) can be seen in patients with greater saphenous reflux. DAVR is suggested an important contributor to skin changes and venous ulcer. Saphenous vein ablation eliminates deep vein reflux in 1/3 of patients with DAVR. The explanation of this phenomenon is still unclear. Tissue pressures (intramuscular, Pim and subcutaneous, Psc) are increased in C6 patients. Saphenous vein ablation alone decreases Psc tissue pressure, while additional subcutaneous fasciotomy also lowers Pim resulting in improved ulcer healing.

Patients and Methods: This study included 25 limbs in 22 patients. Inclusion criteria: Severe venous insufficiency therapy resistant venous ulcers planned for surgical eradication of superficial reflux with or without subcutaneous fasciotomy. Exclusion criteria: History of DVT, previous venous or limb surgery, lesser saphenous vein reflux or deep vein thickening or distortion on Duplex ultrasound scanning.

Patients were assigned to either of 4 subgroups for purpose of analysis; DAVR with fasciotomy (Group1, 5 limbs), DAVR without additional fasciotomy (Group2 5 limbs), no DAVR with fasciotomy (Group 3, 10 limbs) and no DAVR without additional fasciotomy (Group 4, 5 limbs). All patient characteristics were comparable between the groups. Tissue pressure measurements were performed pre- and postoperatively and at 3 months. Ulcer healing was monitored. Changes in deep segmental and axial reflux were compared preoperatively and at 3 months, and the impact of additional subcutaneous fasciotomy and deep axial reflux evaluated.

Results: DAVR was eliminated in 2/10 limbs (20%) following surgery. When additional fasciotomy was performed axial reflux was eliminated in 2/5 limbs (40%), compared to controls (no fasciotomy), 0/5 (0%). Elimination of segmental reflux was higher in patients who had additional fasciotomy ($p=0.0174$) compared to controls.

Intramuscular tissue pressures in limbs evaluated (mmHg) and ulcer healing:

		Preop.	p-value	Postop.	p-value	3 months	Ulcer healing at 3 months
	Fasciotomy	28.4±2.7	<0.001	8.8±2.3	0.005	4.8±1.9	80%, 4/5
Axial Reflux	p-value	n.s		<0.001		<0.001	n.s.
	No fasciotomy	25.8±4.0	<0.001	18.8±4.7	<0.001	11.0±4.2	40%, 2/5
	Fasciotomy	18.1±3.1	<0.001	4.4±2.0	n.s	4.5±1.8	90% 9/10
No axial reflux	p-value	n.s		<0.001		<0.001	0.049
	No fasciotomy	18.2±2.2	n.s.	19.8±3.9	n.s.	19.4±2.5	20%, 1/5

Presence of DAVR increases tissue pressures. In patients with DAVR having additional fasciotomy had higher postoperative Pim than patients with absence of DAVR, while patients with DAVR and no fasciotomy had decreasing Pim at 3 months in limbs where DAVR was resolve.

Conclusion: Venous ulcer disease is linked to venous hypertension, but also increased tissue pressures. Once pressures are decreased, following elimination of superficial reflux and subcutaneous fasciotomy, improved ulcer healing occurs. When primary DAVR is present intramuscular tissue pressure is higher compared to case with no DAVR. Additional fasciotomy lowers Pim over time as DAVR is eliminated.

P-20 The Effectiveness and Use of Compression Stockings of Various Strength For the Treatment of Venous Disorders and Diseases: A Literature Survey

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BACKGROUND: The strength of medical compression stockings (MCS) optimal for the treatment of the various manifestations of venous disorders (CVD) and insufficiency (CVI) is not known.

METHODS: We reviewed the literature for RCTs and large registries on leg compression for occupational symptoms and oedema (CVD, C0s-C3s), symptoms of acute DVT, prevention of the PTS, and chronic venous leg ulcers (C6). Studies were included if they compared one MCS with another one of different strength and/or with no compression or bandaging.

RESULTS: Eleven trials on CVD covered 1.453 subjects. MCS exerting an ankle pressure of 10-20mmHg had a clear effect on symptoms and oedema as compared with <10mmHg, placebo stockings, or no treatment (p20mmHg).

The symptoms of acute DVT were investigated in 2 comparable studies (n=81). MCS 20-30mmHg, 30-40mmHg and bandages provided better relief than bed rest (p<.01) with no difference between the compression modalities.

The prophylaxis of DVT was explored in 2 studies of identical design (n=374). MCS 30-40mmHg were started as symptoms vanished and prevented about half of the PTS as compared with no treatment (p<.01).

Three consecutive German registries (n=2.149) investigated the real world practice. Leg compression was started immediately upon diagnosis of DVT in 98, 99 and 93%, respectively. In the latest trial, bandages were applied initially in 38% and MCS in 62%. MCS 20-30mmHg were used in 93%.

Three studies on ulcer healing at 90 days (n=134) revealed a better healing rate of MCS 20-30mmHg than bandages (65 versus 80%, p<.02). Two trials using a similar plan (299 patients) found specifically designed 30-40mmHg MCS not better than bandaging (47 versus 54%).

CONCLUSIONS: In the clinical situations covered by this survey direct or indirect comparisons revealed that MCS of lower strength were at least as effective as the stronger ones or bandages. The recommendation ensuing from the RCTs on PTS prevention, i.e. to prescribe 30-40mmHg MCS, is not followed by the vast majority of German vascular physicians who use 20-30mmHg MCS. Confirmation of the observed trend in further direct comparison studies would render compression therapy more acceptable without losing effectiveness.

P-21 Management of Venous Injuries At the Air Force Theater Hospital In Balad, Iraq

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Background: Wartime venous injuries may present life-threatening and challenging treatment problems. In order to better understand the nature of venous injuries, we have reviewed the experience of the Air Force Theater Hospital (AFTH) during Operation Iraqi Freedom.

Methods: All vascular injuries treated at the AFTH were registered from September 1, 2004 until August 31, 2007. Data recorded included basic information about the injury and treatment.

Results: Over the period of study 583 cases were entered into the registry. Of these, 226 (38.8%) had venous injuries, of which 47 had an isolated venous injury (20.8%). The mechanism of injury was an explosive device in 115 cases, a gunshot wound in 98, blunt trauma in 4, iatrogenic trauma in 2, and a dog bite in 1 case with the remainder (6) by unknown mechanisms. The site of injury was the lower extremity in 130 cases, the upper extremity in 42, abdomen in 31, neck in 27, and chest in 12. Twenty-three had more than one anatomic area injured. In the majority of cases, ligation was the preferred treatment (103 or 45.6%). Lateral venoraphy was used in 72 cases (31.9%) and venous bypass was used in 26 cases (11.5%). End-to-end anastomosis, panel graft, and shunt were also utilized in only one case each. Eight patients (3.6%) died of their combined injuries with one week of hospitalization.

Conclusions: Wartimes venous injuries are less frequent than arterial injuries. Both the variety of explosive devices encountered as well gunshot wounds are likely to produce venous injury which is most likely to occur in the extremities. Repair (venoraphy or bypass) were utilized with roughly the same frequency as ligation but further follow up on the long term outcome is needed.

P-22 Critical Issues In the Management of Venous Malformation (VM) Coexisting With Lymphatic Malformation (LM) - Klippel Trenaunay Syndrome (KTS)

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Background: Klippel Trenaunay Syndrome (KTS) has been known for the complexity of interwound hemodynamics among its various vascular malformation components. The 'marginal vein' as venous malformation (VM) component of KTS has been mandated to reduce the risk of chronic venous insufficiency (CVI) and pulmonary embolism (PE). But its treatment impact to coexisting lymphatic malformation (LM) component has not been clearly understood.

Methods: We made a retrospective analysis on the KTS cases that underwent the marginal vein resection to assess its impact to coexisting LM.

All N=66 patients were investigated with non- to less-invasive tests: Duplex ultrasonography, MRI, and lymphoscintigraphy. Occasionally percutaneous direct puncture lymphangiography was added to confirm the extratruncular LM, which is infiltrating lymphangioma.

Among N=32 patients with marginal veins, N=27 underwent surgical excision: one stage resection on N=22 with normal deep system, and multistage resection on N=5 with borderline hypoplastic condition.

N=5 among N=32 treated conservatively due to deep vein hypoplasia/aplasia.

Hemodynamic change by the marginal vein compression test on Duplex ultrasonography was interpreted as an increased risk of postoperative venous hypertension by overloading to hypoplastic deep system following the forced diversion of the venous flow from the marginal vein following the resection.

Among N=27 for the resection, N=17 was confirmed for coexisting truncular LM lesion, that is, primary lymphedema as only LM component of KTS; N=7 for extratruncular LM, that is, infiltrating lymphangioma. N=3 for both truncular and extratruncular LMs together.

Results: All N=27 underwent the marginal vein resection under general anesthesia successfully.

N=23 showed excellent to good hemodynamic response and did not develop postoperative acute venous hypertension either through one stage or multistage resection. But N=4 (N=2 through one stage and N=2 through multistage) developed acute venous hypertension (eg. swelling) but all subsided within one month except N=1 which took 6 months for the relief with the conservative measurement (e.g. compression bandage and anticoagulation).

Among N=10 with extratruncular LM, alone (N=7) or combined with truncular LM (N=3), N=3 developed a significant lymphatic leakage; N=2 resolved spontaneously within 3 months but N=1 were not completely resolved with recurrent bouts of leakage and local/systemic sepsis.

None with truncular LM alone (N=17) developed lymphatic leakage but N=2 combined with extratruncular LM have shown further deterioration of lymphatic function on the lymphoscintigraphy although clinically stable with CDT based therapy (follow up - average 3.2 years).

Conclusions: A careful assessment of potential impact of the VM treatment to coexisting LM lesion is warranted for safe management of VM component of KTS; hemodynamic interreaction among the vascular malformation components should remain as a guideline for the therapy.

P-23 Variability of Interface Pressure Exerted By Compression Bandages and Standard Size Compression Stockings

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Background: The "dosage" of prescribed interface pressure plays an important role determining the efficacy of compression therapy in chronic venous disorders.

Aim: To measure the variability of interface pressure of short- and long-stretch bandages under different methods of application.

Methods: The interface pressure of short- and long-stretch compression bandages was measured under different methods of application (ie, low vs medium pressure, one vs two layers). The same practitioner applied the bandages to 12 legs of healthy subjects, and obtained measurements in supine and standing positions immediately following bandage application. These measurements were repeated with custom-made compression stockings fitted to the same legs .

Results: Two layers of short- and long-stretch bandages applied with low or medium pressure provided significantly ($p=0.001$) higher interface pressure when compared with one-layer bandages. When the coefficient of variation was calculated for each set of conditions, it was found that significantly higher coefficients (indicating higher variability) were achieved with bandages applied with one layer ($p=0.05$), or low pressure ($p=0.01$). Interface pressure for a custom-made Class II compression stocking at four measuring points in 12 legs, both in supine and standing positions, also demonstrated considerable variability. The coefficient of variation of the compression stocking as measured at medial distal lower leg was lower when compared with the coefficient of variation of the bandaging systems. (16.7, 18.9 and 24.5% , in standing position for the stocking, short stretch and long stretch bandages respectively, applied with medium pressure).

Conclusion: The wide range of pressure that was observed suggests that many clinical applications of compression bandages and commercially available compression stockings may not provide the intended pressure.

P-24 Recanalization of Short Saphenous Vein After EVLT

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Background: Recanalization after endovenous laser treatment (EVLT) is one of the most disappointed events. Incidence of recanalization after EVLT of SSV (10 %, 3/30) was higher than that of GSV (0.6 %, 1/175). The purpose of this study was to determine the indicative parameters reflecting the recanalization of SSV.

Methods: 30 cases of EVLT of SSV in 28 patients (25 females, 3 males; mean age 57.3 years) between April 2005 and August 2007 were reviewed. All veins were treated with 980 nm diode laser energy delivered into the SSV via a 400 or a 600 micro meter optical fiber. Tumescant anesthesia was delivered perivenously under US guidance. Patients were evaluated clinically and with duplex US at 1 week, 1 month, 3 months, 6 months, 1 year and yearly thereafter to assess treatment efficacy.

Results: Mean diameter of SSV was 6.9 mm and mean VFI was 3.5 ml/sec. The CEAP clinical distribution was C0 1 limb, C2 22 limbs, C3 5 limbs and C4a 2 limbs. Mean follow-up period was 258.4 days (8 - 765 days). Length of treated vein was 19.8 cm (15 - 30 cm). Average withdrawal speed was 1.7 mm/sec (1.2 - 2.8 mm/sec). Average linear endovenous energy density (LEED) was 57.5 J/cm (28.7 - 83.4 J/cm). Successful occlusion of the SSV, defined as absence of flow on color Doppler imaging, was noted in all immediately after treatment. There were three cases of recanalization at 91 days, 182 days and 467 days. In one case, main parameter influenced vein recanalization seemed the low delivered energy (28.7 J/cm). In other two cases, there were no clear differences in the delivered energy with non-recanalization cases. The distance from SPJ to the first branch was very short and at time of recanalization, the first branch appeared again clearly. Short ablated segment of SSV was forced open by high backpressure.

Conclusions: These findings suggests a precise duplex US evaluation of branching pattern at SPJ and additional ablation of branch are needed to accomplish durable occlusion of vein lumen.

P-25 Endovenous Laser Ablation Compared With Stripping - Multi-Center RCT In Japan

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Background: Endovenous laser ablation is becoming one of the optimal treatments of saphenous varicose veins. The advantage of this procedure seems to be less invasive with good outcome compared with traditional stripping. We conducted prospective multicenter randomized comparative study of endovenous laser ablation (EA) with venous stripping.

Methods: A total of 92 patients (C2: 36 cases, C3: 35 cases, C4a: 21 cases) with 84 primary great saphenous vein (GSV) reflux, with 8 primary small saphenous vein (SSV) reflux participated in this study underwent randomly EA or stripping with the ratio of 2 EA to 1 stripping in 5 Japanese medical institutes. Stripping in 30 cases was performed from femoral junction to knee level of GSV or from popliteal junction to the end of venous reflux point of SSV under venous or general anesthesia. Endovenous ablation in 62 cases was done same part at GSV or SSV under local and tumescent anesthesia. Laser instrument was ELVeS 980nm diode laser, Biolitic, Germany. Set power was 9-12 W, average treatment energy was 43.9 J/cm. All cases wore stocking for 1 week after procedures. The results were evaluated by duplex ultrasound and air plethysmographic examination, CVIQII QOL score and clinical examination with 6 months follow up.

Results: The complete obstruction of saphenous vein by EA was observed in 94 %. Recanalization of saphenous vein was found in 2 cases at 72 hrs after EA, 2 cases at 24 weeks after EA., There was significant improvement of QOL score and venous reflux in both EA and stripping group. The duration of hospital stay in stripping group (Average 1.5 days) was longer than that in EA group (Average 2.7 days). The frequency of adverse events after procedures was not different between two groups.

Conclusions: Endovenous laser ablation is useful for saphenous varicose veins as well as stripping. The main advantage of endovenous laser ablation over stripping was short hospital stay.

P-26 Pulse*Spray Sclerotherapy Study: A Pilot Study

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Background: Great saphenous vein (GSV) reflux is the most frequent cause of chronic venous disease. Surgical ligation and stripping of the GSV, thermal ablation with laser or radiofrequency, and sclerotherapy (chemical ablation) are the most effective treatment options. A novel endovenous catheter, which delivers a liquid sclerosant via a pulsed*spray, has received Federal Drug Administration (FDA) clearance as a delivery system. The purpose of this pilot study was to address safety and efficacy associated with this delivery system.

Methods: Over a two month period (December 2006 and January 2007), 10 subjects underwent endovenous pulsed*spray infusion of 3% sodium tetradecyl sulfate (STS) into an incompetent GSV. The range of GSV diameters was between 4 mm and 9 mm. Male or female subjects between 21 and 75 years of age were selected using standardized inclusion / exclusion criteria. The amount of sclerosant delivered was 50% of supine vein volume. All procedures were performed under local anesthesia by a single vascular surgeon. The complete protocol included eight follow-up visits to determine incidence of adverse events, degree of recanalization, and satisfaction with the procedure. These follow-up visits occurred at 48-hours, 1-week, 1-month, 3-months, 6-months, 12-months, 18-months, and 24-months following the procedure. Recanalization in the treated vein segment was determined on the basis of ultrasound examinations.

Results: Results @ 6 months are summarized in the following table:

Parameter	Value	Notes
Number of Veins	10	NA
Number of Subjects	8	2 bilateral procedures
Mean Age / Range (years)	51.6 / 36 - 71	NA
% Female Gender	88	By subject
Mean Treated Segment Length/ Range (cm)	35.6 / 22 - 48	Measured during surgical procedure
Mean Vein Diameter / Range (mm)	4.7 / 4.1 - 5.9	Measured by ultrasound @ time of procedure
Mean Sclerosant Volume / Range (ml)	3 / 2 - 4	Calculated based on vein diameter and length
Average Stump Length / Range (cm)	0.71 / 0.31 - 2.29	@ saphenofemoral junction
Segments of Incomplete Ablation (SIA) - %	50	Demonstrated some time during follow-up
Primary Closure (%)	80	NA
Mean Follow-Up / Range (days)	218.1 / 186 - 254	NA

At 48-hours one subject was noted to have thrombus extension from the GSV into the common femoral vein. This was resolved without treatment at the 1-week visit. At 6-months one subject developed a small fat necrosis at the mid-thigh which required incision and drainage.

Conclusions: Pulsed*spray infusion of liquid STS resulted in 80% primary closure of the incompetent GSV. It is a quick office-based procedure requiring minimal capital expenditure. It approaches the ablative capacity of foam sclerotherapy without worrisome risks of paradoxical embolization.

P-27 Incompetent Perforators - What We Think We Know

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Background: The role of incompetent perforators (IPS) in the pathogenesis of various sequelae of Chronic Venous Insufficiency and the effectiveness of ablation of these vessels using Ultrasound Guided Endovenous Chemical Ablation (UGECA) or other methods is uncertain and controversial. Due to the lack of evidence-based information, a survey was developed with the objective of establishing a consensus among experienced phlebologists related to these issues.

Methods: The survey which consisted of 14 statements using a 0-10 scale (0= strong disagreement; 10=Strong agreement) and 6 additional questions related to treatment technique, was emailed to 30 experienced phlebologists in the US, Canada, and Europe.

Results: Of the 30 surveys sent, there were 28 responses and 26 completed surveys. The Mean Scores related to the clinical significance of IPS, the effectiveness of treating IPS, and the use of Ultrasound Guided Endovenous Chemical Ablation (UGECA) for treatment are listed below:

Mean	SD	Range	
IPS Contribute to the development of:			
Lipodermatosclerosis	7.88	2.34	2-10
Venous Ulcers	8.77	1.82	2-10
Varicose Veins	7.54	2.90	2-10
IP Ablation:			
Improves Deep Venous function	6.85	2.85	0-10
Improves Lipodermatosclerosis	7.88	2.34	2-10
Improves Ulcer healing	8.65	1.60	4-10
Improves Edema	7.32	2.32	1-10
Reduces Venous Ulcer Recurrence	8.42	1.79	4-10
UGECA for IP Ablation			
Is effective	8.69	1.85	3-10
Is the optimal treatment	7.00	2.31	2-10
Is contraindicated by Deep Venous Reflux	2.38	2.16	0-7
Is contraindicated by Deep Venous Obstruction	7.00	3.35	0-10
Should involve Direct injection of the IP	2.23	2.66	0-10
Should involve Injection into a communicating vessel above the fascia	8.65	2.06	0-10
Percentage of IPS closed completely with UGECA	75.88 %	18.87	30-100

In relation to UGECA technique the majority of respondents recommended use of foam sclerosant (Type = polidocanol or soltradelcol; strength = 1-3%; Volume = 0.5 - 3 cc)

Conclusions: Based on the consensus of a group of expert phlebologists, the current opinion regarding incompetent perforator veins is that: 1) The presence of IPS is important in the pathogenesis of lipodermatosclerosis, venous ulcers, and varicose veins, 2) ablation of IPS may improve deep venous function, lipodermatosclerosis, ulcer healing, and edema, and reduce ulcer recurrence, and 3) UGECA using foam sclerosant into a communicating vessel above the fascia is the most commonly recommended technique for IP ablation.

P-28 Non-Saphenous Approach To Varicose Veins With Foam Sclerotherapy

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Background: Foam Sclerotherapy is emerging as effective treatment for varicose veins but ultrasound-guided access to the Saphenous Vein is the usual treatment approach. This study was done to see if vascular access through an available varix would simplify the procedure.

Methods: During the five-year period prior to June 2007, 1648 patients with venous disorders were evaluated and 408 patients had reflux in the great Saphenous vein. One hundred of the most recent patients (126 limbs) with primary varicose veins, CEAP class 2 with great Saphenous reflux were chosen for this analysis. There were 77 women (mean age 34 years) and 23 men (mean age 46 years). Exclusions were patients with venous leg ulcers, venous Angiomata, Klippel-Trenaunay syndrome, recurrent varicose veins and vascular malformations.

Vascular access was gained through an available varix and 1 to 3 needle sites were selected in each treated extremity. Ultrasound monitoring assured intravascular access for the 1-2% Polidocanol foam made by the Tessari technique. A Compounding Pharmacy prepared the Polidocanol for each patient and foam volumes were kept below 16 ml for each treated extremity. Effective 20-30 mm and 30-40 mm Hg stockings and supplemental focal compression with long stretch elastic bandaging for 48 to 72 hours excluded trapped blood and insured vein sealing. DVT surveillance at 7 days and treatment evaluation at 7 and 28 days completed the procedure.

Results: Great Saphenous vein obliteration was achieved in 82% of the extremities, reversal of reflux in an additional 9%, and satisfactory correction of varicose veins in all extremities in an average of 2.8 treatment sessions. Adverse events were absent because of elevation of the legs 45° for 10 minutes following instillation of the foam. No iliofemoral or crural thromboses were detected by the surveillance. No patient required anesthesia or analgesia.

Conclusions: Satisfactory treatment of varicose veins can be achieved without using ultrasound access through the Great Saphenous vein. The procedure is considerably simplified and is less time consuming using direct visual vascular access through a varix rather than ultrasound guided Saphenous access.

P-29 Case Report: Epithelioid Hemangioendothelioma of the Common Femoral Vein

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Background: Symptomatic unilateral leg swelling is a common complaint in patients with post-thrombotic syndrome. A 45 year old female with deep venous thrombosis 15 years earlier presented with left lower extremity swelling and pain. CT scan and venogram revealed a short-segment occlusion within the right common femoral vein and abundant collaterals.

Methods: A discrete solid mass occluding the vein was identified at operation. The mass was 1cm x 2cm, well circumscribed and adherent to the posterior wall of the vein. Because of its atypical appearance a complete oncologic vein resection was carried out with proximal and distal margins. A greater saphenous vein panel graft was used to reconstruct the femoral vein.

Results: Formal histologic analysis revealed Epithelioid Hemangioendothelioma (EH), completely excised. EH is a rare intravascular sarcoma with a predilection towards hematogenous and lymphatic metastasis and a significant mortality rate. Like other sarcomas it is resistant to chemotherapy and radiation. On clinical follow-up the leg swelling resolved and a metastatic work-up was negative. She will undergo lifelong surveillance for recurrence.

Conclusions: Primary vascular malignancies are an uncommon cause of venous occlusion. The ability to detect subtle differences in presentation coupled with a high index of suspicion helps in selecting patients for surgical excision and reconstruction for venous occlusion. When vasculogenic tumors are discovered, adherence to sound oncologic principals during excision minimizes the risk of recurrence and need for re-operation.

P-30 A Report of Two Rare Cases of Venous Aneurysms Involving the Lesser Saphenous Venous System

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Background: Venous aneurysms are rare and reported nearly exclusively in the deep venous system.

Methods: We present two cases of venous aneurysms involving the superficial venous system of the leg.

Results: A lesser saphenous vein aneurysm encountered in a 46 y/o female during evaluation of symptomatic leg varicosities. Examination revealed varicose veins of the leg (C2) and duplex demonstrated a 2.2cm lesser saphenous vein aneurysm with reflux. CT angiogram confirmed the aneurysm (Figure 1) and the patient underwent resection of the lesser saphenous vein aneurysm and phlebectomy of the varicose veins.

Case 2: A 40 y/o male with right leg varicosities and edema (C3) who had undergone ligation of the great saphenous vein with phlebectomy in the past. This patient had recurrence of right leg varicosities and persistent symptoms. Duplex revealed a large venous aneurysm in continuity with the popliteal and lesser saphenous veins. Duplex confirmed reflux in both the femoropopliteal and aneurysmal segment of lesser saphenous. The patient underwent surgical management of the aneurysm with phlebectomy.

Conclusions: These cases represent rare instances of venous aneurysms involving the superficial venous system of the leg. Specifically, lesser saphenous venous aneurysms have rarely been reported. While longstanding reflux and chronic venous hypertension may play a role in venous distension in general, these cases appear to represent distinct aneurysms with unique vessel morphology. Although venous aneurysms are rare they should be considered in the differential diagnosis of chronic venous insufficiency. The diagnosis and treatment of superficial venous aneurysms proceeds along the same lines as other superficial venous disorders.



P-31 Multimodal Endovascular - Open Surgical Approach To Phlegmasia Cerulea Dolens of the Upper Extremity: A Case Report

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Background: There are at least 250,000 recognized cases of DVT in the United States per year, of which approximately only 2-4% involve the upper extremity. Upper extremity DVT leading to phlegmasia cerulea dolens (PCD) occurs only in an estimated 2-5% of these cases, frequently leading to tissue loss and death. We report on a patient who developed deep venous thrombosis in the upper extremity resulting in PCD gangrene of the digits.

Methods: A 77 year old female was hospitalized following a severe respiratory tract infection. She was bed-ridden for many years due to poliomyelitis and a previous stroke. Shortly after admission patient sudden developed massive edema and cyanosis of her right upper extremity (Fig.1). Duplex ultrasound showed acute thrombosis of the brachial and cephalic veins as well as radial artery occlusion. Intravenous antibiotics, isotonic fluids, and heparin were administered. Emergency upper extremity phlebography via brachial vein cut down and rheolytic suction thrombectomy of the brachial and axillary veins was performed. The radial artery was explored, along with a forearm fasciotomy. A thrombolysis catheter was left in the right brachial vein for overnight tPA infusion (Fig.2); The limb was kept elevated.

Results: At 24 hours there was significant edema resolution and repeated venogram showed patent deep upper extremity veins. The upper extremity appearance improved over the following weeks (Fig.3) and regained acceptable motor function. Residual dry gangrene of fingertips was managed conservatively (Fig.4).

Conclusions: The use of a multimodality approach, surgical and interventional, was successful in treating the acute venous obstruction and relieving arterial compression, thereby preventing further fluid sequestration and limb loss.



Figure 1



P-32 Relation Between Number of Pregnancies and Great Saphenous Vein Diameters

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Background: Number of pregnancies has been mentioned as a risk factor for chronic venous insufficiency. We have related reflux to diameter of the great saphenous vein (GSV). This analysis investigated if number of pregnancies correlated with GSV diameter.

Method: Ultrasound evaluation of the GSV was performed during a voluntary service provided by American medical personnel in Guayaquil, Ecuador. Women who perceived they had leg venous problems were evaluated. Median number of pregnancies of 178 women, 51±3 years of age, was 4 (range 0-15). Minimum number of women per subgroup of 0, 1, 2, ¼, 8, 9, >10 pregnancies was 5. GSV diameter in mm was measured at mid thigh with the patient standing. Statistical analysis included calculation of correlation coefficients and t-tests.

Results: Correlation coefficient between number of pregnancies and left GSV diameter calculated for the entire data set was low: 0.06. The correlation coefficient calculated for the average GSV diameter of each subgroup increased to 0.48. GSV diameter was smallest for women without pregnancies, 2.6±0.5 mm (P<.001). GSV diameter of women having one pregnancy, 2.8±1.6 mm, was not significantly different than subgroups with less (P=.30) or more pregnancies (P=.17). Largest GSV diameters were: 4.2±3.4 mm (N=9 pregnancies), 4.1±2.5 mm (N>10), 4.1±2.8 mm (N=2) and 4.0±2.8 mm (N=5). The average GSV diameters for >9 or 1-8 pregnancies were not significantly different (P=.50).

Conclusions: GSV diameter increased with one pregnancy. Otherwise, the GSV diameter was not related to the number of pregnancies.

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Elliott, Joseph P
Granke, Kenneth

MINNESOTA**Rochester**

Agarwal, Gautam
Bjarnason, Haraldur
Felty, Cindy
Gloviczki, Peter
Kalra, Manju
Knott, Andrew W
Lall, Purandath
Lofgren, Eric P
Lofgren, Karl A
Noel, Audra A
Oderich, Gustavo
Rizvi, Adnan
Rooke, Thom W
Shields, Raymond C
Wennberg, Paul W

MISSISSIPPI**Flowood**

Neglen, Peter
Raju, Seshadri

MISSOURI**Columbia**

Gardner, Glenn P

St Louis

Binnington, H. Bradley
Kloecker, Richard J
Rubin, Brian G
Vedantham, Suresh

NORTH CAROLINA**Chapel Hill**

Marston, William A

Charlotte

Robicsek, Francis

Durham

O'Shea, Susan I
Shortell, Cynthia K

Greenville

Powell, C. Steven

NEBRASKA**Omaha**

Lynch, Thomas G

NEW HAMPSHIRE**Lebanon**

Beebe, Hugh G
Walsh, Daniel B

Manchester

Furey, Patricia C

Portsmouth

Sullivan, Cornelius A

NEW JERSEY**Belleville**

Sabety, Adrian M
Sales, Clifford M

Denville

Araki, Clifford T
Mintz, Bruce

Englewood

Elias, Steven

Highland Park

Konigsberg, Stephen F

Morristown

Moritz, Mark W

Oliver, Mark A

New Brunswick

Haser, Paul B

Newark

Abai, Babak

Hobson, Robert W

Jamil, Zafar

Labropoulos, Nicos

Lal, Brajesh K

Padberg, Frank T

Pappas, Peter J

Varnagy, David

Paramus

Wasserman, Dean H

Somerset

Deak, Steven T

NEW MEXICO**Albuquerque**

Corson, John D

Clovis

Paladugu, Ramesh

Santa Fe

Martin, Alfred J

NEVADA**Reno**

Daake, John W

Merchant, Robert F

NEW YORK**Albany**

Chang, Benjamin B

Darling, R. Clement

Roddy, Sean P

Brooklyn

Ascher, Enrico

Hingorani, Anil P

Mutyala, Manikyam

Puggioni, Alessandra

Rai, Dinker B

Buffalo

Harris, Linda M

Vasquez, Michael A

New York

Adelman, Mark A

Baron, Howard C

Gagne, Paul

Green, Richard M

Kabnick, Lowell S

Kent, K. Craig

Min, Robert J

Olin, Jeffrey W

Sadick, Neil S

Schanzer, Harry R

Rochester

Deweese, James A

Illig, Karl A

Rhodes, Jeffrey

Roslyn

Chang, John B

Schenectady

Blumenberg, Robert M

Staten Island

Fodera, Maria Elena

Stony Brook

Criado, Enrique

Gasparis, Antonios P

Ricotta, John J

Williamsville

Taheri, Syde A

OHIO**Cincinnati**

Cranley, Robert D

Hutto, John D.

Kempczinski, Richard

Lohr, Joann M

Muck, Patrick E

Pringle, Timothy C

Reed, Amy B

Valentin, Marlene D

Zayyat, Elie J

Cleveland

Carman, Teresa L

Columbus

Franz, Randall

Dayton

Lemmon, Gary W

Steubenville

Ramnauth, Subhash C

Toledo

Balkany, Louis
Comerota, Anthony J
Dosick, Steven M
Gale, Steven S

Kritpracha, Boonprasit

Nazzari, Munier M.S.
Salles-Cunha, Sergio X

Westlake

Navarro, Felipe

Willoughby

Rollins, David L

OREGON**Portland**

Edwards, James M
Moneta, Gregory L
Pavcnik, Dusan

PENNSYLVANIA**Bethlehem**

Rosenfeld, Joel C

Easton

Balshi, James D
Fisher, Jay B

Mechanicsburg

Calcagno, David

Philadelphia

Blebea, John
Calligaro, Keith D
Merli, Geno J
Van Bemmelen, Paul S
Weingarten, Michael S
Cho, Jae-Sung

Pittsburgh

Jarrett, Fredric
Steed, David L
Webster, Marshall W

Wayne

Ernst, Calvin B

Wilkesbarre

Gruneiro, Laura A

York

Castronuovo, John J

PUERTO RICO**San Juan**

Rodriguez, Agustin A

RHODE ISLAND**Providence**

Patterson, Robert B

SOUTH CAROLINA**Aiken**

Ratliff, Jack L

Charleston

Hallett, John W

Florence

Stonerock, Charles

SOUTH DAKOTA**Sioux Falls**

Ryan, John J.

TENNESSEE**Knoxville**

Goldman, Mitchell H

Memphis

Rohrer, Michael J

TEXAS**Austin**

Dilling, Emery
Zimmet, Steven

Beaumont

Rodman, Charles

Corpus Christie

Rutherford, Robert B

Dallas

Clagett, G. Patrick

Galveston

Hunter, Glenn C
Killewich, Lois A
Pounds, Lori C

Houston

Bush, Ruth
Lin, Peter
Lumsden, Alan B
Peden, Eric

Lubbock

Silva, Michael B

McKinney

Proctor, Mary C

San Antonio

Martinez, Jeffrey M.

Temple

Bohannon, W. Todd

Tyler

Robbins, Mark R

Victoria

Johnston, Robert H

VIRGINIA**Alexandria**

Cordts, Paul R

Annandale

Simonian, Simon J

Charlottesville

Cherry, Kenneth J

Owens, Lewis

McLean

Sidawy, Anton N

Norfolk

Bonawitz, Cara A

Portsmouth

Arbid, Elias J

Reston

Lee, Byung-Boong

Williamsburg

Delarentis, Dominic A

VERMONT**Burlington**

Ricci, Michael A

Stanley, Andrew C

WASHINGTON**Seattle**

Meissner, Mark H

Sobel, Michael

Zierler, Brenda K

Zierler, R. Eugene

Vancouver

Nicholls, Stephen

WISCONSIN**Madison**

Carr, Sandra C

Turnipseed, William D

Manitowoc

Geldner, Terry L.

Milwaukee

Brown, Kellie

Cambria, Robert A

Mewissen, Mark W

Seabrook, Gary R

Towne, Jonathan B

WEST VIRGINIA**Charleston**

AbuRahma, Ali F

Boland, James P

INTERNATIONAL MEMBERS

ARGENTINA

Buenos Aires

Cigorraga, Jorge Raul
Enrici, Ermenegildo A
Papendieck, C. M.
Pietravallo, Antonio F. R.
Segal Halperin, Boris M
Simkin, Roberto

Mendoza

Farmache, Alejandro H

Rosario

Schapira, Armando E

AUSTRALIA

Wagga Wagga

Richardson, Graeme D

AUSTRIA

Vienna

Partsch, Hugo

BELGIUM

Gent

Vandendriessche-Hobbs, Marianne

BRAZIL

Porto Alegre-RS

Komlos, Pedro P

Sao Paulo

Osse, Francisco

CANADA

Calgary

Hill, Douglas

Hamilton

Hirsh, Jack

Quebec

Dion, Yves M

Vancouver

Salvian, Anthony J
Sladen, Joseph G
Taylor, David C

CYPRUS

Nicosia

Nicolaides, Andrew N

DENMARK

Naestved

Rasmussen, Lars H

FRANCE

Cagnes sur mer

Pittaluga, Paul

Chassieu

Perrin, Michel

Grenoble

Carpentier, Patrick H

Marseille

Hartung, Olivier

Montpellier

Milleret, Rene

Neully/Seine

Cornu-Thenard, Andre M

Neully-sur-seine

Uhl, Jean-Francois

Nice

Guex, Jean-Jerome

Paris

Cazaubon, Nichele
Natali, Jean P
Schadeck, Michel P

GERMANY

Berlin

Schultz-Ehrenburg, Ulrich

Bonn

Rabe, Eberhard

Heidelberg

Proebstle, Thomas

Kassel

Gruss, Jorg D

Nuremberg

Noppeney, Thomas

GREECE**Athens**

Balas, Panayiotis E
Liasis, Nikolaos E.

INDIA**Hyderabad**

Gupta, Prem C

ISRAEL**Zerifin**

Bass, Arie

ITALY**Ferrara**

Zamboni, Paolo

Rome

Allegra, Claudio
Caggiati, Alberto
di Marzo, Luca

JAPAN**Fukushima City**

Ogawa, Tomohiro
Hoshino, Shunichi

Ishikawa-Ken

Matsubara, Junichi

Nishihara Okinawa

Sakuda, Hitoshi

Tokyo

Ishimaru, Shin
Yamaki, Takashi

KENYA**Lamu**

Fegan, William G

KOREA**Daegu**

Suh, Bo Yang

KOREA**Seoul**

Kim, Young-Wook

LEBANON**Beirut**

Shamma, Asad R

LUXEMBOURG**Goetzingen**

Lamesch, Alfred J

MALAYSIA**Kuala Lumpur**

Liew, Ngoh C

MEXICO**Mexico City**

Paramo-Diaz, Marcelo

NETHERLANDS**Rotterdam**

Wittens, Cees H. A

Utrecht

Disselhoff, Ben

POLAND**Szczecin**

Kompf, Boguslaw

RUSSIA**St. Petersburg**

Shaidakov, Evgeny V

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

Zuerich

Schepers, Helmut

TURKEY

Istanbul

Kurtoglu, Mehmet H.

UNITED KINGDOM

Channel Islands

Browse, Norman L

Edinburgh

Ruckley, C. Vaughan

London

Burnand, Kevin G

Davies, Alun Huw

Hobbs, John T

Saunders, Beverley

Scurr, John H

Solihull

Bradbury, Andrew W

Wexham

Coleridge Smith, Philip D

WEST INDIES

Trinidad

Maharaj, Dale A

THE 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 the study of or research in venous diseases; (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.

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 a post-doctoral training program 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 letters from the sponsor and two endorsers all of whom should be members of the American Venous Forum.
 - b. 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.
 - c. The Secretary shall send to the Chairman 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 Chairman 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 of election 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 Chairman 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 Chairman 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 of election 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 for 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 its activities.
- 2. The Executive Committee shall be composed of the President, the President Elect, the Secretary, the Treasurer, the Recorder, three Councilors and 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 years each and until their successors are elected and qualified. Three Councilors shall be elected serving overlapping terms of three 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. 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

1. The Standing Committees of the Forum shall consist of a Membership Committee, a Nominating Committee, a Program Committee, a Committee on Arrangements of the Annual Meeting, an International Relations Committee, a Committee on Issues, a Committee on Research, and an Honorary Membership Committee.
2. The By-Laws Committee shall consist of three members to serve overlapping terms of three years each with the (Secretary of the Forum) serving as Chair. A new member shall be appointed annually by the President. They will review the By-Laws from time to time as directed by the Executive Committee.
3. The Membership Committee shall consist of three (3) elected members, who shall 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 chairman. The Nominating Committee shall present, annually, one or more candidate(s) to serve as a member of the Membership Committee as part of its slate to the Executive Committee at its annual meeting. Election shall be by the members at large at the executive session. Election shall be by a majority of the votes cast. 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.
4. 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 make up 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.
5. The Program Committee shall consist of three (3) members who shall be appointed, one in each year, by the President to serve overlapping terms of three (3) 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.

6. The Committee on Arrangements for the Annual Meeting shall be appointed by the President and consists of members resident in the general locality in which the annual meeting is to be held, together with President, Secretary and Recorder acting Ex Officio. The function of this committee shall be the making of general arrangements for the annual meeting.
7. The International Relations Committee shall consist of at least three (3) members who shall be appointed, one in each year, by the President to serve overlapping terms of three years each. The senior member in terms of service on this committee shall be the chairman. The Secretary of the Forum shall serve as Ex Officio of the Committee. The functions of the International Relations Committee shall be to establish and maintain communications with venous forums and other related vascular organizations outside of the United States for the purposes of the exchange of information.
8. The Committee on Issues shall consist of at least four (4) members who shall be appointed, one in each year, by the President 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 Committee on Issues will have, as one of its responsibilities, the monitoring and interpretation of health care related issues. The Committee shall present its observations and recommendations for action to the Executive Committee.
9. The Research Committee shall consist of five (5) members who shall be appointed, one in each year, by the President to serve overlapping terms of five (5) years each. The senior member in terms of service on this committee shall be the chairman. The Secretary of the Forum shall serve as an Ex Officio member of this Committee. The responsibilities of this Committee shall be to promote opportunities in research in venous diseases; to define areas of clinical research that require multicenter clinical efforts; and, to promote research investment in venous disease by national granting agencies."
10. 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 Chairman. The Committee shall be responsible for reviewing candidates for Honorary Membership status and recommending actions to the Executive Committee.
11. The Executive Committee may from time to time establish such other committees as it deems advisable. 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.
12. 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.
13. 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 Chairman of the Membership Committee, the Nominating Committee and the Committee on Arrangements 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. An Active or a Senior member must be a participant, co-author or sponsor of each presentation selected.
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 known as the "D. Eugene Strandness, Jr., MD 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 annual business meeting.

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

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 by three (3) members of the Forum and delivered to the Secretary. 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 **Annual Business Meeting**.

THE AMERICAN VENOUS FORUM

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

AMERICAN VENOUS FORUM

20th ANNUAL MEETING

February 20-23, 2008

AVF EXHIBITING COMPANIES

- ACI MEDICAL..... 36**
Our featured product ArtAssist(R) increases arterial blood flow by applying a unique form of pneumatic compression to the foot, ankle and calf. This method has been successfully applied to diabetic and atherosclerotic patients with critical ischemia and intermittent claudication. Secondly, APG(R) Air-Plethysmograph is a non-invasive diagnostic device that quantifies all components of venous disease.
- AMES WALKER HOSIERY 34**
Ames Walker Hosiery is a premier supplier of compression support stockings, made in an ISO 9001 / CE Mark factory, in North Carolina USA. In business since 1995, we supply a broad range of compression support to consumers and Doctor's offices at value prices. Call 1-866-232-3655 for catalog or more information.
- ANGIODYNAMICS 21/22**
- BACCHUS VASCULAR, INC. 45**
Bacchus Vascular, Inc. was founded by Dr. Thomas Fogarty to transform blood clot removal from peripheral blood vessels into a fast, simple procedure. Thousands of patients suffering from DVT have been treated using the Trellis® Peripheral Infusion System, a catheter-based device designed for single setting treatment.
- BAUERFEIND USA, INC..... 9/10**
- BIACARE MEDICAL..... 5**
BiaCare Medical is a leading manufacturer of custom and standard compression wear, including MedAssist, CompreFit, CompreFit and FoamSleeve brands. BiaCare Medical also produces compression therapy supplies, including LymphBand, LymphSoft, and Silvernette products. BiaCare Medical products are available through leading compression dealers. www.BiaCare.com
- BIOLITEC, INC. 25**
ELVeS™ Laser System, exclusively from biolitec, is among the most effective, minimally invasive therapies for treatment of superficial reflux of the greater saphenous vein, as well as other venous insufficiencies commonly afflicting women. Individual studies using ELVeS™ have produced better than 98% success rates with excellent long-term results.
- BOSTON SCIENTIFIC 35**
- BSN MEDICAL 30**
Jobst is the worldwide leader in venous and lymphatic health products. Jobst has combined innovation and quality to offer a complete range of gradient compression products, providing solutions for patients with various vascular disorders. When you think of comfort, health and style – think of JOBST!

CAROLON COMPANY..... 43

Carolon Company is the compression hosiery manufacturer of choice and the only U.S. owned manufacturer of compression hosiery. Health Support hosiery is easier to get on, more comfortable to wear, washer and dryer safe and much less expensive.

CIRCAID MEDICAL PRODUCTS 20

COOK MEDICAL..... 44

Cook® Medical has the complete line of interventional products from stick to stent. Cook® Medical offers access products like needles, Micropuncture, wire guides, catheters, dilators, introducers and sheaths. Our therapeutic devices include Zilver and Formula stents, Zenith stent-graft, Advance PTA balloon, Tulip IVC Filter, and a complete line of embolization coils.

COVIDIEN, FORMERLY TYCO HEALTHCARE/ KENDALL 3

Covidien, formerly Tyco Healthcare, is a global \$10 billion manufacturer of leading medical devices and supplies, imaging products and pharmaceuticals. The Company employs more than 43,000 people worldwide and is dedicated to working with medical professionals to improve patient outcomes. Its portfolio of leading brands includes Kendall.

DIOMED INC. 1/2

DJO, INC. 37

DJO Incorporated is a global provider of solutions for musculoskeletal health, specializing in rehabilitation and regeneration products for the non-operative orthopedic, spine and vascular markets. Marketed under the Aircast(R), DonJoy(R) and ProCare(R) brands, the Company has a broad range of over 600 rehabilitation, regeneration and vascular system products.

DORNIER MEDTECH 16

Dornier MedTech develops, manufactures, markets and services medical lasers, orthopedic shock wave devices, lithotripters and urotables worldwide, providing innovative therapeutic, diagnostic and service solutions for numerous health-care fields.

EKOS CORPORATION 31

EKOS Corporation is the world leader in providing ultrasound-accelerated drug infusion catheters for diagnosis and therapy. The company's EndoWave™ Peripheral Infusion System is cleared for the delivery of therapeutic agents, including clot-dissolving thrombolytics, into the peripheral vasculature of patients with peripheral arterial occlusions (PAO) and deep vein thrombosis (DVT). <http://www.ekosc corp.com>.

GE HEALTHCARE 15

HEALTHPOINT, LTD. 29

HK SURGICAL..... 28

The Klein Infiltration pump is a vital piece of equipment for physicians performing TLA. With the Klein pump, infiltration time is reduced by 50%. The physician's hand is not mechanically stressed as the pump does the arduous work of TLA infiltration; physicians can focus their physical efforts on the fine motor skills required during intra operative and ultra sound-guided procedures. We have the confidence in the Klein Infiltration Pump to offer a 30 day money back guarantee.

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INA VEIN	42
InaVein has three products to treat the spectrum of vein disorders. It's TCI (Tumescent Catheter Inversion System) helps remove the Great Saphanous Vein with less trauma and pain. Its next generation TriVex II System uses a visualization technique to facilitate complete removal of gnarly varicose veins more quickly vs. conventional phlebectomy procedures. The TES System (Tumescent Enhanced Sclerotherapy - manufactured by Veinnovations) provides a "Convenience Pak" which is used in conjunction with tumescence to more effectively treat spider veins. For more information call 617-245-1965.	
JMS NORTH AMERICA CORP.	24
JMS, a global healthcare company is committed to the importance of developing products that ensure the safety of healthcare workers as well as improving the quality of life for patients. We are proud to introduce the JMS Disposable Vein Stripper, Phlebectomy Hook & Tumescent Needle.	
JUZO	13
LASER PERIPHERALS, LLC	40
Laser Peripherals designs, manufactures, distributes and OEM's medical laser fibers for use in both hard and soft tissue surgical laser applications. We manufacture and market at least thirty different surgical fiber options for use with Diode, Holmium, KTP and Nd:YAG lasers. Fiber designs include freebeam, contact or lateral emitting.	
LYMPHA PRESS USA	38
Lympha Press USA manufactures and distributes Lympha Press compression therapy devices for treatment of lymphedema and venous disorders. Our systems are renowned worldwide for quality and efficacy, and are reimbursed by Medicare and private insurance. See The Petite Basic System, our affordable home care device; Lympha Press Mini, our 12-chamber calibrated gradient system; and Lympha Press Plus, a programmable system for clinic use, as well as unique garments you won't find anywhere else.	
MEDI USA, L.P.	23
Medi is the worldwide leader in medical compression therapy and prevention of venous ulcers. We are dedicated to innovative Phlebology and Lymphology product development, conscientious quality control and total customer satisfaction. When asked how physicians can provide therapeutic compression in product patients will actually wear. Physicians answer with Medi.	
ORGANOGENESIS, INC.	17
Apligraf® is the first and only fully differentiated living bi-layered cell therapy that is FDA approved for the treatment of venous leg ulcers and diabetic foot ulcers. Apligraf is easy to incorporate into practice. Positive reimbursement in all settings. Well tolerated in over 150,000 patient applications. www.organogenesis.com www.apligraf.com	
POSSIS MEDICAL INC.	41
Possis Medical offers the widest range of indications and therapies for thrombus, with products like the Fetch™ Aspiration Catheter, PowerPulse® Delivery, GuardDOG® Occlusion System, SafeSeal™ Hemostasis dressing, and the new, easy-to-use AngioJet® Ultra Rheolytic™ Thrombectomy System with seven specialized catheters providing choice in length, platform, clot removal power and profile.	

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SIGVARIS, INC.	8
<p>SIGVARIS® medical compression stockings offer patients the most effective medical compression therapy available. Manufactured to strict specifications, stockings are offered in various fabrics, colors, and compression ranges. SIGVARIS® products are designed to treat a full range of veno-lymphatic disorders and are prescribed by physicians throughout the world.</p>	
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<p>Terason is the innovator and world’s leader in integrating patented ultrasound microsystem technology with a commercial laptop. This unique architecture provides high performance, cost effective ultrasound to the point of patient care. Terason is entrusted by thousands of clinicians and partners throughout the world for ultrasound diagnosis and interventional guidance.</p>	
THROMBOSISCLINIC.COM	7
TOTAL VEIN SOLUTIONS	11
<p>Total Vein Systems offers the most extensive line of Custom and Universal Procedure Packs for Endovascular Surgery and other procedures associated with Varicose Vein Disease. Total Vein also markets a complete line of premium laser fibers, access devices and venous surgical supplies.</p>	
UNITED MEDICAL INSTRUMENTS, INC.	26
<p>United Medical Instruments (UMI) is a dedicated worldwide Ultrasound company based in San Jose, California. For the past ten years, UMI has been providing Phlebology practitioners with high quality new Siemens ultrasound systems and certified, pre-owned ultrasound equipment by all major manufacturers at competitive prices. UMI has a reputation for delivering the finest quality in ultrasound. www.umiultrasound.com</p>	
VASCULAR SOLUTIONS INC.	6
<p>Vascular Solutions offers the most comprehensive line of endovenous laser therapy products available, from the Vari-Lase® Console to procedure kits and accessories like the Klein Pump. We also support customers with a free Vein Practice Business Plan, reimbursement newsletter, Vein Care Essentials training, patient education, marketing materials and website patient referrals.</p>	
VEIN ADVISORY GROUP	46
VNUS MEDICAL TECHNOLOGIES, INC.	18/19
<p>VNUS® Medical Technologies is the proven leader in minimally-invasive treatment of venous reflux. The VNUS Closure(r) System combines a proprietary radiofrequency (RF) generator with a family of disposable catheters to close diseased veins using temperature-controlled RF energy. Physicians can treat incompetent saphenous, perforator and tributary vessels with minimal pain and bruising.</p>	

VOLCANO THERAPEUTICS, INC. 39

Founded in 2000, Volcano Corporation (NASDAQ:VOLC) develops, manufactures and commercializes a broad suite of intravascular ultrasound and functional measurement products that enhance the diagnosis and treatment of vascular and structural heart disease. For more information, visit the company's website at www.volcanocorp.com

WAGNER MEDICAL 27

We specialize in vein-sclerotherapy products, such as the latest textbooks, bi-directional and unidirectional dopplers, transducers, PPG-LRR detection of acute DVT and venous insufficiency and reconditioned duplex ultrasound. Vein hooks for ambulatory phlebectomies. www.wagnermedical.net

WELLS JOHNSON COMPANY 32

Since 1983, Wells Johnson Company has sold over 9400 Aspirators World Wide, and is dedicated to deliver quality, reliability and great customer service. Wells Johnson Company sells the finest in Aspirators, Cannulas, Infusion Pumps, Garments and Disposables.

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AMERICAN VENOUS FORUM

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27	Withdrawn.....	N/A

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28	K. Uno	Nothing To Disclose.
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	Y. Isaka.....	Nothing To Disclose.
	S. Homma.....	Nothing To Disclose.
	T. Shiina	Nothing To Disclose.
K. Aonuma	Nothing To Disclose.	
29	T. Yamaki.....	Nothing To Disclose.
	M. Nozaki.....	Nothing To Disclose.
	H. Sakurai	Nothing To Disclose.
	M. Takeuchi.....	Nothing To Disclose.
	K. Soejima.....	Nothing To Disclose.
	T. Kono	Nothing To Disclose.
30	O. Hartung	Nothing To Disclose.
31	J. Lee	Nothing To Disclose.
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32	J. Martinez.....	Nothing To Disclose.
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	S. Kazanjian.....	Nothing To Disclose.
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33	D. Paolini	Nothing To Disclose.
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34	L. Robertson	Nothing To Disclose.
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	K. Gallagher.....	Nothing To Disclose.
	S. Carmichael.....	Nothing To Disclose.
	C. Evans.....	Nothing To Disclose.
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V. D. Milojkovic		Nothing To Disclose.
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Abst.#	Author.....	Disclosure
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	D. D. Myers	Nothing To Disclose.
P-2	T. W. Wakefield.....	Nothing To Disclose.
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P-3	M. L. Cuzilla	Nothing To Disclose.
	R. J. Lane.....	Ownership/Partnership: AllVascular Pty Ltd
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P-4	M. L. Cuzilla	Nothing To Disclose.
	T. Yamaki.....	Nothing To Disclose.
	M. Nozaki.....	Nothing To Disclose.
	H. Sakurai	Nothing To Disclose.
	M. Takeuchi.....	Nothing To Disclose.
	K. Soejima.....	Nothing To Disclose.
	T. Kono	Nothing To Disclose.
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	S. LeBaron	Nothing To Disclose.
	C. Nighswander.....	Nothing To Disclose.
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Abst.#	Author.....	Disclosure
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	M. Kurtoglu.....	Nothing To Disclose.
P-10	M. Cazaubon.....	Nothing To Disclose.
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P-11	T. Yamaki.....	Nothing To Disclose.
	M. Nozaki.....	Nothing To Disclose.
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	M. Takeuchi.....	Nothing To Disclose.
	K. Soejima.....	Nothing To Disclose.
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P-12	G. Mosti	Nothing To Disclose.
P-13	G. Mosti	Nothing To Disclose.
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P-14	D. J. Milic	Nothing To Disclose.
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	D. M. Stamenkovic.....	Nothing To Disclose.
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P-15	Withdrawn.....	N/A
P-16	S. Kaspar.....	Nothing To Disclose.
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P-17	J. Benigni	Nothing To Disclose.
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	F. Amsler	Nothing To Disclose.
P-21	W. T. Jones.....	Nothing To Disclose.
	M. A. Ricci	Nothing To Disclose.
	W. D. Clouse.....	Nothing To Disclose.
	T. E. Rasmussen	Nothing To Disclose.
P-22	B. Lee	Nothing To Disclose.
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P-25	T. Ogawa.....	Research Grants: Integral Corporation
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	S. Shokoku	Nothing To Disclose.
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	J. Bergan	Nothing To Disclose.
P-29	M. Lebow	Nothing To Disclose.
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	M. Freeman.....	Nothing To Disclose.
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	S. Stevens	Nothing To Disclose.
	M. Goldman	Nothing To Disclose.
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	T. E. Rasmussen	Nothing To Disclose.

Abst.#	Author.....Disclosure
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P-32	S. X. Salles-Cunha.....Nothing To Disclose.
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NOTES



IS YOUR AVF MEMBERSHIP INFORMATION CURRENT?

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NOTES