International College of Angiology
52nd Annual World Congress

Boone Center Faculty Club • University of Kentucky
Lexington, Kentucky
October 17-19, 2010

John B. Chang, MD, FACS, FICA, *Program Chairman*

Local Organizing Committee
Sibu P. Saha, MD, MBA, FICA, *Chairman*
Thomas F. Whayne, Jr., MD, PhD, FICA, *Co-Chairman*

Scientific Program
Abstracts

International College of Angiology
Scientific Committee

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We welcome you to the 52nd Annual World Congress of the International College of Angiology at the Boone Faculty Club, University of Kentucky, Lexington, Kentucky.

Evaluation and CME Information

The abstracts have been prepared as an adjunct to the oral presentations. Program evaluation forms are provided with your registration packet. We value your input, which allows us to continually improve the program to meet your educational needs. Additional forms are available at our Registration Desk.

At the conclusion of the program please be prepared to hand in your completed evaluation form when you pick up your CME Certificate.

Those attendees who attend the entire program will be given their CME Certificate on-site at the conclusion of the program. Those who arrive late or depart early will have their certificates mailed to them within 3 weeks of the conclusion of the program. Any questions regarding your CME Certificate should be directed to the Executive Office of the ICA at 802.988.4065.

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- If the product he/she will be discussing is not labeled for the use under discussion and the product is still investigational.

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Scientific Sessions
52nd Annual World Congress
Lexington, Kentucky
October 17-19, 2010

Scientific Program
Sunday, October 17, 2010
8:30 AM – 9:00 AM
Boone Center Faculty Club, University of Kentucky

Opening Remarks and Introductions
Introduction By:

Sibu P. Saha, MD, MBA, FICA
Professor of Surgery; President and Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, Local Organizing Committee, 52nd Annual World Congress; Member, International Steering Committee, ICA Research and Education Foundation; Department of Surgery, University of Kentucky, Lexington, Kentucky.

Program Chairman

John B. Chang, MD, FACS, FICA
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John A. Elefteriades, MD, FICA
William W.L. Glenn Professor of Cardiothoracic Surgery; Vice Chairman and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Section of Cardiothoracic Surgery, Yale University School of Medicine, New Haven, Connecticut.

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Chairman, Scientific Committee

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS
Professor Emeritus of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Canada; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Local Organizing Committee

Sibu P. Saha, MD, MBA, FICA, *Chairman*
Professor of Surgery; Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, Local Organizing Committee, 52nd Annual World Congress; Member, International Steering Committee, ICA Research and Education Foundation; Department of Surgery, University of Kentucky, Lexington, Kentucky.

Thomas F. Whayne, Jr., MD, PhD, FICA, *Co-Chairman*
Professor of Medicine; Vice President, International College of Angiology; Co-Chairperson, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Division of Cardiovascular Medicine, University of Kentucky College of Medicine, Lexington, Kentucky.

Committee Members

Patrizio Capasso, MD
Professor of Radiology; Chief, Division of Vascular and Interventional Radiology

Alan Daugherty, PhD, DSc
Senior Associate Dean for Research, UK College of Medicine; Director, Saha Cardiovascular Research Center; Gill Foundation Chair in Preventative Cardiology

Eric D. Endean, MD
Professor of Surgery; Division of General Surgery; Program Director, General Surgery Residency Program; Section Head of Vascular Surgery

Victor A. Ferraris, MD, PhD, FICA
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Eleftherios S. Xenos, MD, PhD, FICA
Assistant Professor of Surgery; Division of General Surgery

Jay Zwischenberger, MD
Johnston-Wright Professor of Surgery and Professor of Pediatrics; Chairman, Department of Surgery

Sunday, October 17, 2010 (Continued)

8:30 AM – 9:00 AM

Welcome Address

President Lee T. Todd, Jr.
President, University of Kentucky, Lexington, Kentucky.

Michael Karpf, MD
Executive Vice President for Health Affairs, UK HealthCare, University of Kentucky, Lexington, Kentucky.

Opening Address

John B. Chang, MD, FACS, FICA, *Program Chairman*
Professor of Clinical Surgery, Hofstra North Shore-LIJ School of Medicine, Uniondale, New York; Albert Einstein School of Medicine, Bronx, New York; Chairman, Board of Directors, International College of Angiology; Editor-in-Chief, *International Journal of Angiology;* Director, Long Island Vascular Center, Roslyn, New York; Attending Surgeon, North Shore-Long Island Jewish Healthcare System, New Hyde Park, New York.

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9:00 AM – 9:30 AM

First Scientific Session

Branched Endograft for TAAAs: The Jikei Experience

A Special Lecture

This special lecture highlights the experience of vascular surgeons using branch endografts for thoracic abdominal aortic aneurysms at Jikei University School of Medicine, Tokyo, Japan.

Introduction By:

John B. Chang, MD, FACS, FICA, *Program Chairman*
Professor of Clinical Surgery, Hofstra North Shore-LIJ School of Medicine, New York; Albert Einstein School of Medicine, New York; Chairman, Board of Directors, International College of Angiology; Editor-in-Chief, *International Journal of Angiology;* Director, Long Island Vascular Center, Roslyn, New York; Attending Surgeon, North Shore-Long Island Jewish Healthcare System, New Hyde Park, New York.

Presentation By:

Takao Ohki, MD, PhD, FICA
Professor of Surgery, Albert Einstein School of Medicine, Bronx, New York; President-Elect and Member, Board of Directors, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, Department of Surgery and Chief, Department of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.

Sunday, October 17, 2010
9:30 AM – 10:30 AM
Second Scientific Session

Young Investigator Award Competition

Oral Presentations

This session will focus on the latest developments in certain areas of angiology, including persistent bilateral sciatic arteries, influence of BMI on post-operative transfusions, Denver drain placement and pleural effusion, combination of gene therapy in neovascularization, and the role of angiotensin II Type 1b receptors in atherosclerosis.

Moderators:

Alan Daugherty, PhD, DSc
Senior Associate Dean for Research, UK College of Medicine; Director, Saha Cardiovascular Research Center; Gill Foundation Chair in Preventative Cardiology, University of Kentucky, Lexington, Kentucky.

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS
Professor Emeritus of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Canada; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

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9:30 **Persistent Bilateral Sciatic Arteries: A Rare Finding of Teaching Importance:** Michèle M. Cowan, BSc, MSc, Instructor; Karam M. Hamweyah, Mohamed D. Sabbagh, Bakr A. Swaid, Abdulaziz K. Alkattan, Paul Ganguly, MBBS, MD, Professor of Medicine; College of Medicine, Alfaisal University College of Medicine, Riyadh, Saudi Arabia.

Background
The persistent sciatic artery (PSA), as a rare presence, was found bilaterally in a female cadaver during routine dissection at Alfaisal University. In fetal development, the sciatic artery branch from the axial artery supplies the posterior thigh and then regresses by the 3rd month in utero with the presence of the deep femoral artery. In rare cases the sciatic artery persists and is often associated with concomitant presence of other complications such as ischemia and aneurysms.

Objective
To present, as a case report, the rare clinical findings of bilateral persistent sciatic arteries and other associated vascular anomalies in a female cadaver.

Methods/Results
On a routine dissection conducted by the first year medical students, the presence of bilateral PSA in a female cadaver was found. The PSA followed the sciatic nerve with branches in the posterior thigh and finally joined the popliteal artery near the knee. The superficial femoral arteries were present although the deep femoral arteries were completely absent. In addition, there were several other vascular anomalies including aneurysms of the abdominal aorta and left subclavian, and the brachiocepahilic trunk originating from the ascending aorta. This is the first report, which demonstrates bilateral PSA associated with these vascular anomalies.

Conclusion
The presence of this bilateral PSA and its associated vascular anomalies proved to be an effective clinical teaching tool in demonstrating the embryological basis of vascular structures. It provided insight into a rare vascular variant that, in this case, is associated with unique aneurysms and brachiocephalic trunk deviation.

9:40 **Effect of BMI on Post-Operative Transfusions and 24-Hour Chest Tube Output:** Heather R. Nolan, BA, AS, Chandrashekhar Ramaiah, MD, Department of Surgery, Division of Cardiothoracic Surgery, University of Kentucky College of Medicine, Lexington, Kentucky.

Background
With the increasing population of obese individuals in the United States, much focus has been on the effect of obesity on surgical outcomes.

Objectives
Our goal was to conclude if obesity, determined by body mass index (BMI), contributed to bleeding in coronary artery bypass graft (CABG) surgery as measured by intra-operative and post-operative packed red blood cell transfusion frequency and amount, as well as by 24-hour chest tube output draining the surgical site.

Methods
Patient information was gathered retrospectively by chart review. We identified 150 subjects who underwent single-surgeon off-pump or on-pump CABG surgery between September 2006 and April 2009. BMI groups included normal weight (BMI <25), overweight (BMI 25-29), and obese (BMI ≥30). A chi-squared test was used to determine variances in number of transfusions, while ANOVA was used to analyze transfusion amount and 24-hour chest tube amount.

Results
Obese patients showed significantly less transfusions intra-operatively (p=.022) and a trend for fewer transfusions within 72 hours post-operatively (p=.540). The amount of packed red blood cells during the 72-hour post-operative period was less in the obese cohort (p=.021) and also showed a linear trend (p=0.20). Additionally, 24-hour chest tube output showed variation across all three BMI categories (p=.018) with chest tube output decreasing with increasing obesity in a linear fashion (p=.006).

Conclusion
Transfusion rate and amount decreased with increasing obesity, significantly so in the 72-hour post-operative period. Immediate surgical site post-operative bleeding, as measured by 24-hour chest-tube output, showed statistically significant variances based on BMI with chest tube output decreasing as obesity increased in a linear fashion. Transfusion rate/amount indirectly indicates total blood loss decreases in obese patients. The additional finding in chest-tube output gives a direct measurable indicator of blood loss from the surgical site showing that increasing BMI is linearly correlated with decreasing post-operative bleeding.

Sunday, October 17, 2010

9:50 **Effectiveness of Denver Drain Placement with Malignant Pleural Effusions:** Sangita Sudharshan, BS, Victor Ferraris, MD, PhD, FICA[2], Tyler Gill Professor of Surgery; Secretary General and Member, Board of Directors, International College of Angiology; Editor, *International Journal of Angiology;* Timothy Mullett, MD[2], Chandrashekhar Ramaiah, MD[2]; [1]University of Kentucky College of Medicine, Class of 2011; [2]Department of Surgery, Division of Cardiothoracic Surgery, University of Kentucky College of Medicine, Lexington, Kentucky.

Background

Pleural effusions occur frequently among patients with various types of advanced malignancies. As a result, the quality of life of these patients is decreased remarkably due to buildup of excess fluid resulting in shortness of air. Treatment of malignant pleural effusions can include placement of a chest tube with subsequent chemical pleurodesis, mechanical pleurodesis, or placement of a Denver drain. We reviewed our experience with Denver drain use to treat malignant pleural effusions in order to assess outcomes and resource utilization of this intervention.

Methods

A retrospective study of consecutive Denver drain patients (n=163, including 41 outpatients) who were treated between July 2001 and April 2008 was performed to evaluate operative and discharge outcomes.

Results

The average age of the patients was 59.32 years (range: 24 to 89). Lung cancer, breast cancer, and ovarian cancer were common primary diseases in this patient population. The mean hospital stay after Denver drain placement was 3.19 days (range: 0 to 56), with 41 patients treated as outpatients. Thirteen inpatient deaths were related to the patients' primary diseases, but no deaths were due to drain placement itself. Eight patients (4.91%) required re-operation to replace a non-functioning Denver drain or to add an additional drain, and 6 patients underwent a second procedure to place a contralateral Denver drain. One hundred twenty-six patients (77.30%) were discharged home following the procedure and hospital stay. Fifty-five patients achieved spontaneous pleurodesis with an average length of placement of 136 days.

Conclusions

Denver drain placement is a safe and effective approach to the treatment of pleural effusions. The advantages of Denver drain placement include symptomatic relief and improved quality of life. This method allows patients to spend time at home with their family and avoid prolonged hospitalization. The one-time success of the procedure is very high and no complications among these patients due to drain placement were found.

Sunday, October 17, 2010

10:00 **Effect of Combination Gene Therapy with Vascular Endothelial Growth Factor and Angiopoietin-1 after Myocardial Infarction Enhances Neovascularization and Reduced Ventricular Remodeling in the Type-1 Diabetic Myocardium:** Ram Sudheer Adluri, PhD, Samson Mathews Samuel, MPhil[1]; Mahesh Thirunavukkarasu, PhD[1]; Lijun Zhan, BS[1]; Chuanfu Li, MD[2] and Nilanjana Maulik, PhD, FICA[1]; [1]Molecular Cardiology and Angiogenesis Laboratory, Department of Surgery, University of Connecticut Health Center, Farmington, Connecticut; [2]Department of Surgery, East Tennessee State University, Johnson City, Tennessee.

Background

Co-morbidities among patients with diabetes are well known phenomenon in clinics. They are characterized by a decreased collateral vessel formation in response to coronary ischemic events. Vascular endothelial growth factor (VEGF) is a major mediator of neovascularization in physiological and pathological conditions with crucial roles in developmental blood vessel formation that was found to be inhibited in diabetic complications.

Objectives

The effects of overexpressing VEGF/Ang-1 have been studied in inducing angiogenesis, but the formation of functional vessels and its molecular mechanism remains a challenge. The present study evaluates the reversal of diabetes-mediated impairment of angiogenesis in the infarcted diabetic rat myocardium by combination gene therapy with *Ad.VEGF* and *Ad.Ang1*.

Methods

Ad.VEGF and *Ad.Ang1* were intramyocardially administered in combination immediately after myocardial infarction (MI) to nondiabetic and diabetic rats. *Ad.LacZ* was similarly administered to the respective control groups. MI was created by permanent LAD ligation. The hearts were excised for molecular and immunohistochemical analysis at predetermined time points. The myocardial functions were measured by echocardiography 30 days after the surgical intervention.

Results

Reduced myocardial fibrosis and increased capillary (Diabetic *Ad. LacZ* MI *vs.* Diabetic *AdVEGF*+*Ang1*MI:1769±7*vs.*2206±100 counts/mm^2) and arteriolar density (28±0.1*vs.*44±0.3 counts/mm^2) along with reduced ventricular remodeling (ejection fraction-44±1.6*vs.*56±3%; fractional shortening-22±2*vs.*31±1.9%; LVIDs-7.8±0.3*vs.*7±0.19 mm, and heart rate- 197±5.6*vs.*235±8.1 beats/min), as assessed by echocardiography, was observed in the treated diabetic animals when compared to the non-treated diabetic controls. Western blot analysis showed increased p-MAPK2 (4 fold), 2 days after the treatment and increased expression of VEGF (2.4 fold), Flk-1 (4.6 fold), angiopoietin-1 (Ang-1) (3.6 fold), Tie-2 (2.2 fold), and survivin (10 fold), 4 days after treatment in the diabetic animals. Further, combination gene therapy increased the DNA binding activity of nuclear factor-κB (gel shift analysis) in the diabetic animals.

Conclusions

Taken together, our preclinical data demonstrate the efficacy of coadministration of adenoviral VEGF and Ang-1 gene therapy in enhancing VEGF/Ang-1/MAPK2/NF-κB and survivin-mediated angiogenesis and reducing ventricular remodeling in the infarcted diabetic myocardium. These results sought for the initiation of a clinical trial to assess the efficacy of this therapeutic strategy in the treatment of diabetes-related human heart failure.

10:10 **Angiotensin II Type 1b Receptor Deficiency Increases Hypercholesterolemia-Induced Atherosclerosis in Male LDL Receptor Deficient Mice:** Aruna Poduri, PhD, Deborah A. Howatt, BS[1], Anju Balakrishnan MS[1], Lisa A. Cassis PhD [2], Alan Daugherty PhD DSc [1,2]; [1] Saha Cardiovascular Research Center, [2] Graduate Center for Nutritional Sciences, University of Kentucky, Lexington, Kentucky.

Background

Angiotensin II (AngII) type 1 receptors are expressed in rodents as 2 subtypes, termed a and b, as a result of chromosomal duplication. These proteins are highly homologous, although differences in the cytoplasmic domains could potentially affect the involvement of specific signaling pathways. Our previous study has demonstrated that AT1a receptor (AT1aR) has a marked effect on reducing hypercholesterolemic-induced atherosclerosis. However, AT1b receptors (AT1bR) are highly expressed in aortic tissue and the dominant receptor type mediating aortic contractile responses.

Objective

The aim of this study was to determine the contribution of AT1bR on hypercholesterolemia-induced atherosclerosis in mice.

Methods and Results

Male AT1bR+/+ (n=14) and -/- (n=11) mice (6-8 weeks old) in an LDL receptor -/- background were fed a saturated-fat enriched diet (21% wt/wt milk fat; 0.15% wt/wt cholesterol) for 12 weeks. Body weight was monitored weekly. There was no difference in body weight in both study groups (+/+: 36.4 ± 1.4 versus -/-: 37.7 ± 1.2g). Systolic blood pressure (SBP) was measured using a non-invasive tail-cuff system on conscious mice. There was no difference of SBP at baseline in both the study groups. During 12^{th} week of the study, AT1bR-/- deficient mice had lower blood pressure as compared to wild type mice fed on saturated high fat diet (+/+: 132 ± 4.0 versus -/- : 106 ± 3.0 mmHg; $P<0.05$). AT1bR -/- mice had increased plasma total cholesterol concentrations as compared to +/+ mice after 12 weeks of feeding the saturated fat enriched diet (+/+: 1329 ± 95 versus -/-: 2004 ± 117mg/dL; $P<0.001$). Atherosclerotic lesion areas were measured on the intima of the aortic arch by the en face technique. Unexpectedly, AT1bR deficient mice had significantly increased development of atherosclerotic lesions (+/+: 15.8 ± 1.6 versus -/- : 23.6 ± 0.7%; $P<0.001$).

Conclusion

Deficiency of AT1bR receptor unexpectedly increased development of hypercholesterolemia-induced atherosclerosis in LDL receptor -/- mice.

Sunday, October 17, 2010
10:45 AM – 12:00 PM
Third Scientific Session

Poster Presentations

These poster presentations provide insight into the role of the renin-angiotensin system in aortic aneurysms and atherosclerosis, and the use of near-infrared diffuse optics spectroscopies in the detection of cerebral ischemia.

Moderators:

Pertti Aarnio, MD, PhD, FICA
Professor of Surgery; Member, Board of Directors and Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Department of Surgery, Satakunta Central Hospital and University of Turku, Pori, Finland.

Jeffrey T. Prem, MD, FACS, FICA
Associate Clinical Professor of Surgery, Northeast Ohio College of Medicine, Canton, Ohio; Medical Director, Vascular Services and Vascular, Mercy Medical Center, Canton, Ohio.

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10:45 **Detection of Cerebral Ischemia during Carotid Endarterectomy using Near-Infrared Diffuse Optics Spectroscopies:** Yu Shang, PhD[1], Ran Cheng, BS[1], Lixin Dong[1], Sibu P. Saha MD, MBA, FICA[2], Professor of Surgery; Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, Local Organizing Committee, 52nd Annual World Congress; Member, International Steering Committee, ICA Research and Education Foundation; Guoqiang Yu, PhD[1]; [1]Center for Biomedical Engineering, [2]Cardiothoracic Surgery, University of Kentucky, Lexington, Kentucky; University of Kentucky College of Medicine, Lexington, Kentucky.

Background
Intraoperative detection of cerebral ischemia due to carotid arterial clamping during carotid endarterectomy (CEA) is critical for preventing the risk of brain injury and perioperative stroke. However, no techniques exist in clinic for direct monitoring of cerebral microvascular perfusion and oxygenation during CEA.

Objectives
This study evaluates a novel near-infrared diffuse correlation spectroscopy (DCS) flow-oximeter for detecting cerebral ischemia/improvements during/after CEA.

Methods
Twelve patients undergoing CEA participated in this study. Two probes containing the source and detector fibers (at a separation of 2.5 cm) were taped respectively on left and right sides of frontal head. Each probe was connected to a DCS flow-oximeter with two source wavelengths of 785 and 854 nm. The changes of oxygenated and de-oxygenated hemoglobin concentrations ($\Delta[HbO_2]$ and $\Delta[Hb]$) were determined by measuring light intensity reductions at the two wavelengths. Relative change of cerebral blood flow (rCBF) was extracted from the measured autocorrelation function of detected light. In addition, 16 EEG electrodes were placed all over the head to monitor brain waves.

Results
During CEA, rCBF and oxygenation in surgical sides were largely altered by arterial clamping (ΔrCBF = -24.6 ± 7.3% (mean ± SE), $p = 0.006$; $\Delta[HbO_2]$ = -3.4 ± 1.1 μMol, $p = 0.009$; $\Delta[Hb]$ = +3.6 ± 1.6 μMol, $p = 0.05$) whereas no significant changes were found in the control sides. EEG measurements did not show any change. After CEA, a significant increase in rBF (+44.9 ± 16.8%, $p = 0.02$) was found in the surgical side whereas no improvement in oxygenation was found in both sides.

Conclusion
The results demonstrate that the DCS flow-oximeter has higher sensitivity in detecting cerebral ischemia during CEA, compared to the EEG. Post-CEA blood flow was significantly higher than the pre-CEA value, indicating the acute treatment improvement in cerebral microcirculation. This study suggests a potential role for the DCS flow-oximeter in evaluation of the post-CEA improvement in cerebral hemodynamics, and in assistance of the shunting choice during CEA.

10:52 **Intraoperative Evaluation of Revascularization Effect on Ischemic Muscle Hemodynamics using Near-Infrared Diffuse Optical Spectroscopies:** Ran Cheng, BS[1], Yu Shang, PhD[1], Guoqiang Yu, PhD[1], Sibu P. Saha, MD, MBA, FICA[2], Professor of Surgery; Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, Local Organizing Committee, 52nd Annual World Congress; Member, International Steering Committee, ICA Research and Education Foundation; [1]Center for Biomedical Engineering, [2]Cardiothoracic Surgery, University of Kentucky, Lexington, Kentucky; University of Kentucky College of Medicine, Lexington, Kentucky.

Background

Peripheral arterial disease (PAD) may result in tissue ischemia in the lower extremities, causing intermittent claudication, rest pain and limb loss. Although arterial revascularization can improve macro-circulation, reestablishing large arterial blood flow by revascularization may not completely correct the underlying microvascular atherosclerosis or metabolic dysfunction in lower leg muscles. An approach to assess microvasculature hemodynamics in ischemic muscles could enable evaluation of the success of revascularization.

Objectives

This study tests the sensitivity of novel near-infrared (NIR) diffuse optical spectroscopies in evaluation of hemodynamic improvements in ischemic skeletal muscle after arterial revascularization.

Methods

Twelve limbs in eleven patients with PAD who underwent lower leg revascularization were evaluated. Two sterilized fiber-optic probes were taped on each of the calf muscles of both legs respectively. The probes were connected to a recently developed novel NIR diffuse correlation spectroscopy flow-oximeter that can simultaneously measure relative changes of muscle blood flow (rBF), oxy-hemoglobin concentration (Δ[HbO2]), and deoxy-hemoglobin concentration (Δ[Hb]). Calf muscle blood flow and oxygenation were continuously monitored throughout the entire revascularization process. The acute hemodynamic improvements immediately after revascularization were evaluated by the comparison of 20-minute averaged post-revascularization data and the 10-minute pre-revascularization baseline.

Results

The optical measurements demonstrated high sensitivity to dynamic physiological events (e.g., arterial clamping and releasing). Significant rBF improvements in the operated calf muscles [+46.4% ± 11.5%, $p = 0.003$] were observed after revascularization, whereas acute effects in tissue oxygenation were not evident (Δ[HbO2] = -0.7 ± 1.4 μMol, Δ[Hb] = +2.2 ± 1.3 μMol, $p > 0.05$).

Conclusion

The revascularization of the macro-circulation resulted in acute blood flow improvements in muscle microvasculature that were associated with symptomatic improvements. The observed decoupling of tissue blood flow and oxygenation changes after revascularization further emphasizes the necessity for simultaneous monitoring of both parameters. The novel optical measurement of revascularization effects on muscle hemodynamics holds a potential for objectively assessing the success of lower limb revascularization.

Sunday, October 17, 2010

10:59 **Isolated Necrotizing Aortitis Presenting as Incidental Thoracoabdominal Aortic Aneurysm: A Case Report:** Jeremiah T. Martin, MD, William N. O'Connor MD, Chandrashekar Ramaiah MD; University of Kentucky College of Medicine, Lexington, Kentucky.

Background
Noninfectious aortitis is frequently asymptomatic yet often leads to the development of ascending aortic aneurysms requiring repair.

We present the case of a 64 year old Caucasian female who presented to our medical center with an incidentally discovered thoraco-abdominal aneurysm. She had previously been in good health and had not complained of chest pain or been otherwise symptomatic. At presentation to our clinic her ascending aorta measured 5cm at the sino-tubular junction (STJ) with dilation of her descending thoracic aorta to 6cm. Her coronary angiogram was normal. Cross sectional imaging was notable for thickening of the aortic wall along its length. (Figure 1, below)

Objectives
The entity of isolated noninfectious aortitis is increasingly recognized as an identifiable factor leading to ascending aneurismal disease. In reviewing this case we outline current understanding and guidelines for management and followup of this pathology.

Methods
Operative repair of the ascending arch was conducted using an interposition graft. The aortic valve apparatus was normal and the proximal anastomosis was created at the STJ. Intraoperatively, note was made of an inflammatory obliteration of the aorto-pulmonary window. It was not possible to completely excise the posterior aortic wall.

Results
Our patient had an uneventful recovery and final pathology revealed necrotizing aortitis (NA). She is currently undergoing routine surveillance of her descending thoracoabdominal aneurysm. Recent case series indicate that NA is a histologically distinct process, which is associated commonly with development of ascending aneurysm, and while it is most commonly an isolated finding, may be associated with other vascular abnormalities including stenoses of branch vessels.

Conclusion
There is a growing body of literature suggesting that NA represents a distinct clinical entity, associated with the development of ascending aortic aneurysms. Further research is required to determine the optimal followup and value of medical therapies.

Figure 1
Saggital section of aorta demonstrating thickening of the aortic wall, most prominent in the descending aorta. The soft tissue thickening is most notable as it relates to branch vessels (SMA shown)

11:06 **Testosterone Developmentally Programs Angiotensin II-Induced AAAs in Female Hyperlipidemic Mice through Smooth Muscle AT1a Receptors:** Xuan Zhang, BS[1], Jessica J. Mooreleghen, BS[2], Debra L. Raterim, BS[2], Deborah A. Howatt, BS[2], Alan Daugherty, PhD, DSc[2], Lisa A. Cassis, PhD[3], [1]Graduate Center for Toxicology, [2]Cardiovascular Research Center, [3]Graduate Center for Nutritional Sciences, University of Kentucky, Lexington, Kentucky.

Background and Objective

Infusion of angiotensin II (AngII) to hyperlipidemic male mice induces atherosclerosis, ascending aortic and abdominal aortic aneurysms (AAAs) through angiotensin type 1a receptors (AT1aR). Amongst these vascular pathologies, AAAs exhibit marked sex differences. Recent studies demonstrate that androgen administration positively regulated smooth muscle cell (SMC) AT1aR expression in abdominal aortas to promote AngII-induced AAA formation in adult female mice. The purpose of this study was to determine if testosterone developmentally programs increased abdominal aortic SMC AT1aR expression and AngII-induced AAA formation.

Methods and Results

Female LDLR-/- mice that were either wild type (AT1aR f/f, SM22-Cre0/0) or SMC specific AT1aR deficient (AT1aR f/f SM22-Cre1/0) were developmentally programmed by administration of testosterone (400 µg/mouse, s.c.) or vehicle (25 µl corn oil) at 1 day of age. At 12 weeks of age, female mice were fed a high fat diet and infused with AngII (1,000 ng/kg/min) for 28 days. Females exposed neonatally to testosterone exhibited a 2-fold increase in abdominal aortic AT1aR mRNA compared to vehicle. Both developmental testosterone programming and deficiency of AT1aR in SMC had no effect on baseline blood pressures, AngII-induced hypertension, or serum cholesterol concentrations in adult female mice. In wild type females, testosterone programmed a striking increase in AAA incidence (15% vs 64%, vehicle vs testosterone, respectively; $P<0.001$). In contrast, SMC AT1aR deficiency reduced AAA incidence (64% vs 33%, wild type vs SMC AT1aR deficiency, respectively; $P<0.05$) in testosterone programmed female mice. Developmental testosterone programming also increased atherosclerosis and ascending aortic aneurysm formation in wild type and SMC AT1aR deficient female mice.

Conclusions

These results demonstrate that developmental programming by testosterone increases atherosclerosis, ascending aortic aneurysm and AAA formation in adult female LDLR-/-mice. Testosterone programming of AAAs, but not atherosclerosis or ascending aortic aneurysm was ablated in female mice with SMC AT1aR deficiency. These results suggest that sex differences in AAA formation may arise from developmental programming effects of sex hormones.

11:13 **Attenuation of Endogenous Angiotensinogen Concentrations Reduces Abdominal Aortic Aneurysms Induced by Exogenous Angiotensin II:** Congqing Wu MS[1,2], Lisa A. Cassis PhD[2], Alan Daugherty PhD DSc[1,2], Hong Lu MD PhD[1,2]; [1]Saha Cardiovascular Research Center, [2]Graduate Center for Nutritional Sciences, University of Kentucky, Lexington, Kentucky.

Background
Chronic infusion of exogenous angiotensin II (AngII) induces abdominal aortic aneurysm (AAA) formation in mice. However, the role of the endogenous renin angiotensin system (RAS) during exogenous AngII infusion to the development of this vascular pathology remains unclear.

Objective
To determine whether AAAs formed by AngII infusion were modified by deficiencies of the endogenous RAS in mice that are hypomorphic for angiotensinogen (hypoAGT).

Methods
Wild type and hypoAGT mice in a mixed C57BL/6 x 129 background were developed with LDL receptor deficiency. Males (3-6 months old) were fed a saturated fat-enriched diet (21% wt/wt fat, 0.15% wt/wt cholesterol) and infused with AngII (1000 ng/kg/min) for 4 weeks. Systolic blood pressure (SBP) was measured prior to AngII infusion and near the end of the infusion period using a non-invasive tail-cuff system. Upon termination, ex vivo diameters of suprarenal aortas and arch atherosclerosis were measured.

Results
The hypoAGT mice exhibited barely detectable plasma angiotensinogen concentrations and low mRNA abundances in liver, but had normal neonatal survival rates and kidney development. Wild type and hypoAGT mice had no difference in body weight before AngII infusion, however, hypoAGT were significantly lower than wild type in body weight after AngII infusion. The hypoAGT mice had strikingly lower plasma angiotensinogen concentrations than wild type mice during AngII infusion. Although SBP was significantly lower in hypoAGT mice at baseline, AngII infusion elevated SBP of hypoAGT mice to the level that was even higher than wild type. Both wild type and hypoAGT mice were hypercholesterolemic, and their plasma cholesterol concentrations were not different. The hypoAGT mice developed less arch atherosclerotic lesions, which is not statistically significant ($p = 0.052$). In addition, hypoAGT mice had significantly reduced abdominal aortic dilation compared to wild type mice ($p < 0.05$).

Conclusion
The hypoAGT mice with reduced endogenous secretion of angiotensinogen are protected from AAA formation induced by exogenous Ang II.

Sunday, October 17, 2010

11:20 **Angiotensin Converting Enzyme (ACE) Deficiency in Bone Marrow-Derived Cells Has No Effect on Hypercholesterolemia-Induced Atherosclerosis:** Xiaofeng Chen MD PhD[1], Hong Lu MD PhD[1], Lisa A. Cassis PhD[2], Alan Daugherty PhD DSc[1,2]; [1]Cardiovascular Research Center, [2] Graduate Center for Nutritional Sciences, University of Kentucky, Lexington, Kentucky.

Background

The rennin angiotensin system (RAS) exerts a profound influence on the development of atherosclerotic lesions in both humans and experimental animals. Angiotensin-converting enzyme (ACE) is the classically defined enzyme that converts angiotensin (Ang) I into AngII. Pharmacological approaches using multiple ACE inhibitors have consistently shown reduced atherosclerosis in many animal models***.*** Genetic approaches using homozygous ACE deficient mice in a hypercholesterolemic background significantly reduced atherosclerosis. Macrophages are the most abundant inflammatory cells accumulating in atherosclerotic lesions. This cell type has all the components to synthesize AngII including ACE. The objective of this study was to determine whether ACE in bone marrow-derived cells contributes to hypercholesterolemia-induced atherosclerosis in mice.

Methods

Bone marrow cells were harvested from either ACE +/+ or -/- male mice and injected into age-matched male LDL receptor -/- recipient mice that had been irradiated with a total of 900 Rads from a cesium source (delivered in two equal doses of 450 Rads 3 hours apart). Four weeks after bone marrow repopulation, recipient mice were fed a diet supplemented with saturated fat (21% wt/wt milk fat and 0.2% wt/wt cholesterol) for 12 weeks. Atherosclerosis was assessed on the intima surface of aortic arches by the en face technique.

Results

The ACE genotypes of donor cells were confirmed by PCR of ACE in bone marrow-derived cells of the recipients. The ACE genotypes of donor cells used for repopulation had no effect on body weight, white blood cell counts, plasma cholesterol concentrations, or systolic blood pressure. Mice repopulated with cells derived from ACE -/- mice had a significant reduction in atherosclerotic lesion size in the aortic arch (Median percent lesion area: 3.74%, versus 7.48%, $P<0.05$).

Conclusion

ACE deficiency in bone marrow-derived cells reduces hypercholesterolemia-induced atherosclerosis in mice.

Sunday, October 17, 2010

12:00 PM – 1:30 PM

Fourth Scientific Session

Management of TAA Open Repair vs Endovascular Techniques —A Debate

A Special Luncheon Session

This debate will put forward the pros and cons of open repair and endovascular techniques in the management of thoraco-abdominal aortic aneurysms.

Moderators:

John B. Chang, MD, FACS, FICA, *Program Chairman*

Professor of Clinical Surgery, Hofstra North Shore-LIJ School of Medicine, New York; Albert Einstein School of Medicine, New York; Chairman, Board of Directors, International College of Angiology; Editor-in-Chief, *International Journal of Angiology;* Director, Long Island Vascular Center, Roslyn, New York; Attending Surgeon, North Shore-Long Island Jewish Healthcare System, New Hyde Park, New York.

David J. Minion, MD

Associate Professor of Surgery; Division of General Surgery, University of Kentucky, Lexington, Kentucky.

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John A. Elefteriades, MD, FICA

William W.L. Glenn Professor of Cardiothoracic Surgery; Vice Chairman and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Section of Cardiothoracic Surgery, Yale University School of Medicine, New Haven, Connecticut.

vs

Karthekeshwar Kasirajan, MD, FICA

Assistant Professor of Surgery; Co-Chairperson, Scientific Committee, International College of Angiology; Editor, *International Journal of Angiology;* Department of Surgery, Emory University School of Medicine, Atlanta, Georgia.

Sunday, October 17, 2010
1:30 PM – 2:30 PM
Fifth Scientific Session

Advances, Controversies, and Latest Concepts in Cardiovascular Medicine & Surgery I

This session will focus on the latest concepts in cardiovascular medicine, with a special reference to pregnancy-associated plasma protein and acute coronary syndrome, familial heart block, anti-factor Xa, and the treatment of pulmonary thromboembolism.

Moderators:

Otmar M. Pachinger, MD, FESC, FAHA, FICA
Professor of Medicine; Chief of Cardiology, Medical University of Innsbruck, Innsbruck, Austria.

Eiji Tamiya, MD, FICA
Co-Chairperson, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Visiting Professor, Juntendo University, Tokyo, Japan; Chief, Department of Cardiology, Koto Hospital, Tokyo, Japan.

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1:30 **Influence of Concomitant Heparin Administration on Pregnancy-Associated Plasma Protein-A Kinetics: Need for Reassessment of the Diagnostic (Prognostic) Value in Acute Coronary Syndrome:** Petr Hájek, MD[1], Milan Macek Sr., MD, PhD[2], Associate Professor of Medicine; Andrej Lashkevich, MD[2], Hana Klučková[2], Marie Hladíková[3], Eva Hansvenclová[1], Martin Malý, MD, PhD[1], Josef Veselka, MD, PhD, FICA[1], Professor of Medicine; Alice Krebsová, MD, PhD[4]; [1]Cardiovascular Center, Department of Cardiology, Charles University Prague, Faculty of Medicine and University Hospital Motol, Prague, Czech Republic; [2]Department of Biology and Medical Genetics, Charles University Prague, Second Faculty of Medicine and University Hospital Motol, Prague, Czech Republic; [3]Department of Medical Informatics, Charles University Prague, Second Faculty of Medicine, Prague, Czech Republic; [4]Department of Internal Medicine/Cardiology, Virchow Klinikum, Humboldt University, Berlin, Germany.

Background
Pregnancy-associated plasma protein-A (PAPP-A) is known as a sensitive, diagnostic and prognostic marker in acute coronary syndrome (ACS). Recently, it has been suggested that serum levels of PAPP-A might be influenced by heparin.

Objectives
The aim of our study was to ascertain the time course of PAPP-A levels with regard to heparin administration during coronary angiography in patients without ACS.

Methods
PAPP-A serum levels were studied in 14 patients with coronary angiography and heparin administration (Group A) and in 5 patients with normal coronary angiograms without heparin administration (Group B). Samples were examined before the start of the procedure, 3 times during first 30 minutes, and then 1, 2, 4, 6, 12 and 24 hours thereafter.

Results
Both groups of patients were similar in baseline clinical characteristics (NS). There was no difference in PAPP-A levels between both groups before the start of the procedure (medians of PAPP-A were 8.3 vs.8.2 mIU/L; P=1.0). Heparin caused rapid increase of PAPP-A with the peak of levels not later than 20 minutes after heparin administration (median PAPP-A was 103.1 mIU/L). PAPP-A level increase was followed by rapid decrease and after 12 hours its levels were not different from the levels before heparin administration. PAPP-A levels correlated with activated clotting time ($r = 0.9$; $P = 0.0001$) and with dose of heparin (medians of PAPP-A peak levels with dose of heparin >/< 5000 IU were 112.5 vs. 77.3 mIU/L; P=0.03). No significant changes in serum PAPP-A levels were observed in patients without heparin administration.

Conclusion
PAPP-A serum levels significantly increased with concomitant heparin administration. Therefore, the results of this pilot study suggest the diagnostic and prognostic validity of PAPP-A in ACS can be verified only before or more than 12 hours after heparin administration when the effect of heparin is eliminated.

Sunday, October 17, 2010

1:40 **A Look at the Peak and Trough Levels of Anti-Factor Xa in Patients on Enoxaparin with CCT<30 ml/minute:** Ashish A. Sule, MBBS, MD, FICA[1], Associate Consultant; Tay J. Chin, MD[2], Professor of Medicine; Senior Consultant and Head; Joseph Rajendran, MD[3], Resident Physician; Arul E[4], Senior Statistician, Clinical Research Unit; Department of General Medicine, Tan Tock Seng Hospital, Singapore.

Introduction

Peak anti-factor Xa test is a well recognised test on enoxaparin in patients who have renal impairment. Recommendations are to maintain peak anti-factor Xa levels between 0.5-1. Trough levels of anti-factor Xa at 12 hours have been studied in pregnant patients and are recommended to be maintained between 0.2-0.4. The trough levels of anti-factor Xa, have neither been validated, nor studied in patients with creatinine clearance (CCT) <30 ml/min.

Objectives and Hypothesis

Is there increased risk of bleeding on enoxaparin when CCT <15 ml/min? Is the anticoagulation dose of enoxaparin high, adequate, or low? The aim of this study was to assess the safety and any readjustment of doses if needed for enoxaparin. Moreover, trough levels have not been analyzed in these groups of patients.

Methods

This was a Prospective Pilot Study sponsored by NHG-NUS scholarship program. Total number of patients recruited was 15. Patients with CCT <30 ml/min on enoxaparin were recruited for the study. DSRB approval was taken prior to study. Sub-group analysis was done with CCT <15 ml/min and CCT between 15-30 ml/min. Basic demographic data such as age, gender, race, diagnosis and creatinine values at baseline were noted. Creatinine clearance was calculated in these patients using the Cockcroft and Gault equation. Adverse events were monitored. Chi-square test or Fisher's exact test were used. Data analysis was obtained using the statistical program, Stata V10.2 (Stata Corp, College Station, TX, USA). Level of significance set at 5%.

Results

No bleeding or adverse events were noted. In patients with CCT <15ml/min, peak anti-Xa were therapeutic when the CCT was between 15-30 ml/min, and the peak anti-Xa levels were subtherapeutic. The trough levels were subtherapeutic in both subgroups.

Conclusion

It is safe to give enoxaparin once a day to patients with renal impairment with CCT <30 ml/min. In patients with CCT between 15-30 ml/min, the peak anti-Xa values are low. Further evaluation is required to determine its clinical significance.

1:50 **Bilateral Massive Pulmonary Thromboembolism in a Young Patient Treated with Supportive Measures with an Excellent Outcome:** Ashish A. Sule, MBBS, MD, FICA[1], Associate Consultant; Tay J. Chin, MD[2], Professor of Medicine; Senior Consultant and Head; Nihar Pandit, MD[3], Trainee Registrar; Joseph Rajendran, MD[4], Resident Physician; Department of General Medicine, Tan Tock Seng Hospital, Singapore.

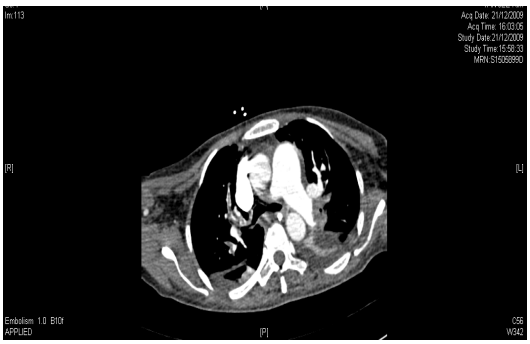
Introduction

Bilateral massive pulmonary thromboembolism is a life threatening condition. Patients present with circulatory and respiratory collapse. These patients need either thrombolysis or thrombectomy by specialized cardiovascular thoracic surgeons for good outcome.

Case Report

We describe a 48-year old lady who presented on 16-12-2009 with bilateral massive pulmonary thromboembolism and left leg deep vein thrombosis (DVT), pneumonia, disseminated intravascular coagulation (DIVC), with severe hypotension, and type 1 respiratory failure requiring intubation in intensive care unit.

A 2D Echo was done on admission. Patient was diagnosed with an ejection fraction of 55%, dilated right atrium, and ventricular pulmonary hypertension. A CT pulmonary angiogram was performed on 21-12-2009; outcome was extensive bilateral pulmonary thromboembolism (Fig 1).



We performed left leg ultrasound Doppler on 21-12-2009; and the diagnosis was extensive DVT. A CT scan abdomen was performed on 21-12-2010. Diagnosis was uterine mass 20x14x22cm with compression of the sigmoid colon with gross ascites.

Progress in the wards

She was treated with piperacillin, tazobactum, and supportive measures. Patient underwent temporary inferior vena cava (IVC) filter insertion on 31-12-2009. This patient showed clinical improvement over the next 2 weeks with antibiotics and supportive measures. Abdominal paracentesis was done on 07-01-2010. There was no evidence of malignancy.

A repeat 2 D-echo was performed on 12-01-2010: The ejection fraction was 70%, with no evidence of increased right heart pressure or pulmonary hypertension. Patient was discharged on 18-01-2010.

This patient underwent a modified radical hysterectomy on 09-02-2010 in KK Hospital. Histopathology report: Adenomyosis with extensive necrosis and infarction, no malignancy. A repeat CT pulmonary angiogram on 11-02-2010: complete resolution of pulmonary embolism, no evidence of lung parenchymal damage.

She followed-up in the vascular medicine clinic on 22-04-2010. She was well, no more ascites or pelvic mass and systemic examination was normal. She underwent successful IVC filter removal on 01-04-2010. In view of persistence of left leg DVT on repeat ultrasound Doppler scan, she was started on anticoagulation on 02-04-2010.

Conclusion

Massive pulmonary thromboembolism may be treated conservatively if there is an absolute contraindication to thrombolysis, anticoagulation or thrombectomy. The outcome may take weeks before the patient shows improvement. IVC filter insertion may be needed if there is presence of DVT to prevent the subsequent episodes of pulmonary embolism, as this could be fatal.

Sunday, October 17, 2010

2:00 **The Clinical Significance of Familial Heart Block:** Malka Yahalom, MD, DSc, FICA[1,3], Co-Chairperson, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Nathan Roguin, MD[1,3], Raneen Sawaid Kaiyal, MD[2], Jacob Bornstein, MD [2,3], Raymond Farah, MD[3,4]; [1]Pacemaker Unit and Cardiology Department, [2]Department of Obstetrics and Gynecology, Western Galilee Hospital, Nahariya, Israel; [3]Faculty of Medicine, Technion, Haifa, Israel; [4]Department of Internal Medical B, Safed, Israel.

Introduction

Familial abnormalities of the conduction system, both symptomatic and asymptomatic, are often overlooked in daily medical practice.

Familial (and congenital) Heart Block (FHB) may be associated with other diseases such as, Hypertrophic and Dilated Cardiomyopathies, Familial Dysautonomia, Emery-Dreifuss dystrophy, and Charcot-Marie-tooth disease. Familial Heart Block maybe transmitted with collagen disease antibodies in the mother. It may appear at any stage of life.

Purpose

We present the clinical and genetic findings, to emphasize the clinical significance of familial heart block, particularly in the presence of symptoms, including those, which are sporadic and minor, or are in the perinatal period.

Methods and Subjects

The members of three families (9 individuals in 3 generations) with symptomatic heart block are presented, eight of which required permanent cardiac pacemaker therapy.

Last year, a female baby was born to one of our patients. Pre-Natal Fetal Arrhythmia had been noticed and 2nd degree Atrio-Ventricular (AV) block (Mobitz I & II) was observed on 24-hours Holter monitoring.

Conclusions

We recommend careful follow-up for family members, whom FHB is present, particularly when symptoms exist and in the perinatal period.

Sunday, October 17, 2010
2:30 PM – 3:15 PM
Sixth Scientific Session

Video Presentations

This session is video presentations on the repair of vascular ring, posterior post-infarct ventricular septal defects, and the management of median arcuate ligament syndrome.

Moderators:

John A. Elefteriades, MD, FICA
William W.L. Glenn Professor of Cardiothoracic Surgery; Vice Chairman and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Section of Cardiothoracic Surgery, Yale University School of Medicine, New Haven, Connecticut.

Randall W. Franz, MD, FACS, RVT, FICA
Clinical Associate Professor of Surgery, Ohio University School of Medicine, Columbus, Ohio; Auxiliary Clinical Faculty of Surgery, Ohio State University School of Medicine, Columbus, Ohio; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* Chief, Vascular Surgery, Grant Medical Center; Medical Director, Grant Vascular and Vein Center, Columbus, Ohio.

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2:30 **Repair of Vascular Ring with Resection of Kommeral Diverticulum and Transposition of Aberrant Left Subclavian Artery:** John Samas, MD, Frank Manetta, MD, FICA, Editor, *International Journal of Angiology;* Department of Cardiothoracic Surgery, Long Island Jewish Hospital, North Shore LIJ Health System, New Hyde Park, New York; David B. Meyer, MD, Department of Pediatric Cardiothoracic Surgery, Cohen Children's Medical Center, North Shore LIJ Health System, New Hyde Park, New York.

Background
A 32-year old female presented with a first time complaint of dysphagia. Radiographic studies revealed external compression of esophagus secondary to vascular ring. The anatomy included right-sided aortic arch with aberrant retroesophageal left subclavian artery and left-sided ligamentum arteriosum. In addition, a large Kommerall's diverticulum was discovered at the origin of the left subclavian artery. Traditional repair of ligamentum division and adhesiolysis leaves a large Kommeral still adjacent to the esophagus with the potential for persistent or recurrent symptoms.

Objectives
Modifications of operative techniques to both alleviate the patient's current symptoms of dysphagia and to attempt to minimize future recurrence.

Methods
In addition to ligamentum division and esophageal adhesiolysis, the operative repair included resection of the Kommeral diverticulum with reimplantation of the left subclavian artery into the left carotid artery.

Results
The patient's dysphagia resolved and postoperative barium studies showed no residual compression. There were no significant perioperative complications.

Conclusion
Resection of Kommeral's diverticulum is a potential adjunct to traditional repair of vascular rings, and might offer better long-term palliation by minimizing residual vascular compression of the esophagus.

2:40 **Double Patch Technique for Repair of Posterior Post-Infarct Ventricular Septal Defect:** Chand Ramaiah, MD, FICS, University of Kentucky College of Medicine, Lexington, Kentucky.

Background

Post-infarction ventricular septal defect (VSD) occurs in less than 1-2% of acute myocardial infarction (AMI) patients and is responsible for more than 5% of early deaths. Posterior VSD is less common and carries almost twice the mortality compared to anterior VSD.

Methods

Retrospective chart review and literature review. Show intra-operative video and describe the technique of double patch VSD exclusion.

Results

A 49 year old male presented with 4 days history of chest discomfort and several hours history of acute shortness of breath. Electrocardiogram in the emergency room revealed evidence of inferior myocardial infarction and ST-T changes in the lateral leads. Emergent cardiac catheterization was done and showed occlusion of RCA and 80% stenosis in the circumflex branch, a large apical, posterior VSD, pulmonary hypertension, and high end diastolic pressure. Cardiac index was 1.3 Liters/meter sq. Intra aortic balloon pump was placed. Echocardiogram was done and it confirmed the VSD. He was operated on urgently. Two vessel coronary artery bypass and VSD repair was done. Approach was biventriculotomy with incision on either side of the posterior interventricular septum. Double patch of bovine pericardium was used, one on right and second on the left ventricular side to exclude the infarct. Space was filled with Bioglue® (Cryolife, Inc. Kennesaw, GA, USA). His post operative course was prolonged and complicated by delirium tremens and after 5 weeks he was discharged home.

Conclusion

Posterior post infarction VSD is an infrequent complication after AMI but carries very high early mortality. Without closure of VSD the early mortality is very high, 25% at 24 hours and 50% at one week. In the last decade transcatheter septal occluders have been used to treat some of these defects with success. In our patient the defect was not suitable for percutaneous closure due large defect and no rim for anchoring the device.

2:50 **Median Arcuate Ligament Syndrome—Combined Open and Endovascular Management:** Robert Carter, MD, Department of Surgery, University of Kentucky Medical Center, Lexington, Kentucky.

Background

Mesenteric ischemia has multiple etiologies. Median arcuate ligament is cited as one of the causes of mesenteric ischemia in some patients' population. Patients with median arcuate ligament syndrome usually have normal SMA and IMA and no evidence of atherosclerotic disease. Researchers believe since you have normal SMA and IMA that celiac compression on its own shouldn't cause mesenteric ischemic symptoms. We describe our experience with a patient who had symptomatic median arcuate ligament syndrome whose symptoms has improved after combined open and endovascular surgical intervention.

Methods

A 36 year old male patient presented with abdominal pain and 80 pounds weight loss over the past year. Pain is unrelated to meals. Workup included upper and lower endoscopy, gall bladder evaluation; and CT abdomen and pelvis. All workup was negative for GI source of his pain and weight loss. CTA aorta showed an evidence of celiac artery origin compression, consistent with Median arcuate ligament syndrome. SMA, IMA and remaining vasculature were unremarkable. Conventional mesenteric angiogram revealed similar results. The patient was treated surgically by performing a laparotomy to release median arcuate ligament compression through an upper abdominal midline incision. Evidence of celiac arterial constriction by the ligament was identified. Through a left brachial artery approach the celiac trunk was cannulated, and pressures across the stenotic segment were measured and 40 mmHg pressure gradients were identified. Balloon expandable Express stent was deployed across the stenosis with immediate resolution of stenosis. Post-operatively patient did well with weight gain within 3 months and complete pain relief. Three months celiac duplex follow up was normal.

Sunday, October 17, 2010

3:30 PM – 5:15 PM

Seventh Scientific Session

Cardiovascular Care in Kentucky

This session is devoted to cardiovascular care in Kentucky with special reference to cardiovascular imaging, the latest technology in cardiology, interventional electrophysiology, robotic coronary bypass surgery, and the surgical treatment of coronary artery anomalies and peripheral vascular disease.

Moderators:

Thomas F. Whayne, Jr., MD, PhD, FICA

Professor of Medicine; Vice President and Co-Chairperson, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Co-Chairman, 52nd Annual World Congress, International College of Angiology; Division of Cardiovascular Medicine, University of Kentucky, Lexington, Kentucky.

Jay Zwischenberger, MD

Johnston Wright Professor of Surgery, and Professor of Pediatrics; Local Organizing Committee Member, 52nd Annual World Congress, International College of Angiology; Chairman, Department of Surgery, University of Kentucky Chandler Medical Center, Lexington, Kentucky.

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3:30 **Update in Cardiovascular Imaging:** Mushabbar A. Syed, MD, FACC, Associate Professor of Medicine, Director, Cardiovascular Imaging, Director, Cardiovascular CT and MRI, Departments of Medicine (Cardiology) & Radiology, Stritch School of Medicine, Loyola University Chicago, Maywood, Illinois.

Recent years have seen several exciting developments in cardiovascular imaging. These include evolving role of magnetic resonance imaging and computed tomography as well as technical refinements for established modalities such as echocardiography and nuclear imaging.

This talk will focus on the role of magnetic resonance imaging and computed tomography in the evaluation of cardiovascular diseases. Current clinical applications and recently published practice guidelines by AHA and ACC will be reviewed. A brief overview of future developments will be provided.

3:45 **New Technologies That Will Revolutionize Cardiology:** John C. Gurley, MD, University of Kentucky, Lexington, Kentucky.

This presentation will discuss the emerging technologies that will fundamentally change the practice of cardiovascular medicine over the next five years. The presentation will review catheter-based approaches to valvular and structural heart conditions that are likely to eliminate the need for major operations and risky medications.

Objectives

After this presentation, attendees will:

1. Appreciate new catheter-based methods of heart valve replacement and repair.
2. Understand how implantable sensors will help patients manage heart failure from home and avoid hospitalizations.
3. Understand how left atrial appendage occluders can eliminate the need for warfarin in atrial fibrillation.
4. Appreciate the wide scope of new catheter-based treatments for structural heart conditions.

Sunday, October 17, 2010

4:00 **Interventional Electrophysiology: Arrhythmia Management Beyond the Endocardial Surface:** Gustavo X. Morales, MD, Assistant Professor of Medicine, University o f Kentucky, Lexington, Kentucky.

Background

Interventional cardiac electrophysiology has rapidly evolved in the last 10 years. A better understanding of arrhythmias, their mechanisms, and substrates, have taken the electrophysiologists to treat arrhythmias in areas beyond the traditional endocardial surface.

This presentation will review the current ablation strategies beyond the endocardial surface in common cardiac arrhythmias such as: epicardial approach for atrial fibrillation ablation, ablation inside the coronary sinus for post-ablation atrial tachycardias, ligament of Marshall atrial tachycardias, epicardial mapping and ablation of ventricular tachycardia and atrio-ventricular accessory pathways, epicardial transcatheter left atrial appendage closure devices, ablation of premature ventricular contractions and ventricular tachycardia from the aortic coronary cusps and coronary sinus venous system.

Objectives

We will provide an updated review of current strategies to map and ablate frequent cardiac arrhythmias outside the endocardial surface.

4:15 **Robotic Coronary Artery Bypass Surgery in 2010:** Chand Ramaiah, MD, FICS, University of Kentucky, Lexington, Kentucky.

Background

Traditional coronary artery bypass surgery (CABG) is done via sternotomy and the use of cardiopulmonary bypass (CPB). Minimally invasive approaches to traditional CABG procedures have gained popularity in the last 2 decades. Some of these procedures are now done using robotic assistance.

Methods

Literature review of robot assisted coronary bypass procedures, results, advantages and disadvantages of the procedure are discussed.

Results

Robot assisted CABG procedures are gaining popularity in part due to patient demand for less invasive procedures and availability of advanced technology. The number of facilities with the da Vinci® Robot (Intuitive Surgical, Inc. Sunnyvale, Ca, USA), have increased significantly over the last 5 years. However, the number of robot assisted CABG procedures has not increased proportionally. Early results of Robotic CABG and hybrid procedures are encouraging. Long-term patency of the grafts done this way, and the results of hybrid procedures are not known at this time. The cost and increased time required may also play a role in the slow acceptance of the technology.

Conclusion

Robot assisted CABG procedures and hybrid coronary artery revascularization are feasible, and early results acceptable. More studies are needed before widespread acceptance of this technology for wide range of procedures.

4:30 **Surgical Treatment of Coronary Artery Anomalies:** Mark D. Plunkett, MD, Cara L Lawrence, BS, Deborah J. Kozik, DO; Department of Surgery, Division of Cardiothoracic Surgery, Pediatric and Congenital Heart Surgery, University of Kentucky College of Medicine, Lexington, Kentucky.

Background

Coronary artery anomalies are rare congenital defects often associated with sudden death. Patients present at various ages with symptoms of myocardial ischemia.

Objective

We evaluated a consecutive series of patients with coronary anomalies treated by surgical repair at our institution.

Methods

Between June 2008 and June 2010, 7 patients (ages 4-52 years) underwent surgical repair of coronary anomalies. Five patients had anomalous right coronary arteries arising from the left coronary sinus with a slit ostium and an intramural course between the pulmonary artery and the aorta. These patients underwent surgical repair with an unroofing procedure. Two patients had an anomalous left coronary artery arising from the pulmonary artery (ALCAPA) and underwent a direct coronary transfer with relocation of the left coronary to the aorta.

Results

All patients presented with symptoms suggestive of ischemia (chest pain, dyspnea on exertion, or syncope). Diagnosis was confirmed with echocardiography, cardiac catheterization, CTA, or MRA imaging. All patients underwent direct repair using cardiopulmonary bypass. There were no deaths. One patient required RVAD support postoperatively and had subsequent right coronary artery bypass. All patients were discharged without symptoms and with normal echocardiograms. All have remained symptom free since discharge without reintervention.

Conclusions

Anomalous origins of coronary arteries are rare congenital defects that present at various ages and are associated with symptoms of ischemia and sudden death. Surgical correction can be performed with good anatomic and functional outcomes. A direct repair of these anomalies is the preferred surgical approach.

4:45 **A Paradigm Shift in Treatment of Peripheral Vascular Surgery?** Eric D. Endean, MD, FACS, Gordon L Hyde Professor and Chair in Vascular Surgery, Department of Surgery, University of Kentucky College of Medicine, Lexington, Kentucky.

Open surgical approaches including endarterectomy or bypass have been the standard approach for treatment of most arterial diseases. As in other areas of surgery, minimally invasive approaches, such as percutaneous transluminal angioplasty, atherectomy, stents, and endografts are being vigorously pursued. Most reports to date demonstrate what can be done, but do not address whether endovascular outcomes are similar or better than invasive procedures. Because of the scope and complexity of Peripheral Vascular Surgery, two areas will be briefly addressed: carotid disease and infrarenal abdominal aortic aneurysms.

A number of randomized trials have established carotid endarterectomy as a safe and effective treatment for severe symptomatic or asymptomatic carotid stenosis. Many reports suggest that carotid artery stenting (CAS) may be as safe as endarterectomy. However, these reports have limitations in that patients were not randomized, report on limited number of patients, reflect one institution or practitioner, and/or were sponsored by industry. Two randomized studies[1,2] have been reported this year: The International Carotid Stenting Study (ICSS) and the Carotid Revascularization Endarterectomy vs. Stenting Trial (CREST). Both are prospective studies in which patients were randomized to receive endarterectomy or carotid angioplasty and stent. The ICSS randomized 1713 patients in 50 European centers. The incidence of stroke was 7.7% in the stenting group compared to 4.1% in the endarterectomy group (p=0.002). Similarly, the incidence of stroke, death, or myocardial infarction was 8.5% in the stenting group compared to 5.2% in the endarterectomy group (p=0.006). Their conclusion was "carotid endarterectomy should remain the treatment of choice for patients suitable for surgery." CREST randomized 2502 patients in 117 centers in the United States and Canada. They found that the procedural rate of stroke was 4.1% for the stenting group compared to 2.3% for the endarterectomy group (p=0.01). The incidence of myocardial infarction was 1.1% in the stenting group compared to 2.3% in the endarterectomy group (p=0.03). They concluded that the composite outcome of stroke, myocardial infarction, or death did not differ between groups.

Open repair of abdominal aortic aneurysms (AAA) has been established as effective in preventing rupture. In 1990, Parodi reported the first series of patients who had undergone endovascular repair of AAA. Since then there has been an explosion of technologic advances such that approximately 70% of AAA's are currently repaired using an endovascular approach. In 2010, the long-term outcome of the Endovascular Aneurysm Repair (EVAR) trial was reported.[3]. The study was carried out at 37 hospitals in the United Kingdom where 1,252 patients were randomized to open vs. endovascular repair of abdominal aortic aneurysm. Thirty-day mortality was 1.8% in the endovascular repair group compared to 4.3% of the open-repair group (p=0.02). However, there was no difference between groups in long-term survival. Higher rates of complications and need for reintervention was observed in the endovascular repair group, leading to overall higher costs for endovascular repair.

Endovascular treatment for vascular disease has made significant advances. However, as illustrated by the quoted studies, well-designed trials are needed to demonstrate that the technical advances also result in improved clinical outcomes. Additional studies are needed to evaluate outcomes for patients undergoing endovascular treatment of arterial disease involving other areas of peripheral vascular disease including the lower extremities and visceral/renal arterial systems.

[1] Lancet 2010; 375:985-997.
[2] N Engl J Med 2010; 363:11-23.
[3] N Engl J Med. 2010; 362:1863-1871.

Monday, October 18, 2010
7:30 AM – 8:30 AM
Eighth Scientific Session

sRAGE—A Predictor of Post-PCI Restenosis and Measures to Reduce Incidence of Restenosis

A Special Breakfast Session

This special lecture deals with advanced glycation end products (AGEs), and the receptors for AGE (RAGE) and soluble RAGE (sRAGE). The sensitivity and specificity of sRAGE in the prediction of post-PCI restenosis will be described, along with possible measures to reduce the incidence of restenosis, will be discussed.

Introduction By:

John B. Chang, MD, FACS, FICA, *Program Chairman*
Professor of Clinical Surgery, Hofstra North Shore-LIJ School of Medicine, New York; Albert Einstein School of Medicine, New York; Chairman, Board of Directors, International College of Angiology; Editor-in-Chief, *International Journal of Angiology;* Director, Long Island Vascular Center, Roslyn, New York; Attending Surgeon, North Shore-Long Island Jewish Healthcare System, New Hyde Park, New York.

Presentation By:

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS
Professor Emeritus of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Canada; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Erick D. McNair, PhD, AFICA, Calvin R. Wells, MD, FRCPC, Rashpal Basran, MD, FACC, FRCPC, A. Mabood Qureshi, MSc, FICA; Colin Pearce, MD, FRCPC, FACC, Jacobus Devilliers, MD, FRCPC, Jason Orvold, MD; Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Background

Advanced glycation end products (AGEs) interacts with receptor for AGEs (RAGE) and increases the expression of inflammatory mediators and oxygen radicals (ORs) leading to development of atherosclerosis. Soluble receptor for AGEs (sRAGE) competes with RAGE for AGEs binding and reduces inflammation and atherosclerosis. Low levels of serum sRAGE would increase the chances of atherosclerosis (stenosis).

Objectives

To determine if (i) post-PCI restenosis is associated with low serum levels of sRAGE and high levels of AGEs and (ii) low sRAGE and high ratio of AGEs/sRAGE have predictive value for post-PCI restenosis.

Methods

Angiography was performed in 46 NSTEMI patients undergoing PCI (bare metal stent implantation) to assess post-PCI restenosis. Serum sRAGE, AGEs, inflammatory mediators [tumor necrosis factor- alpha (TNF-alpha) and soluble vascular cell adhesion molecules-1 (sVCAM-1)] were measured in NSTEMI patients before and 6 months after PCI, and in 20 control subjects.

Results

Of the 41% of NSTEMI patients who underwent bare metal stent implantations developed_restenosis within 6 months and that was associated with lower pre-PCI serum levels of sRAGE, and higher AGEs/sRAGE ratio, TNF-alpha and sVCAM-1 compared to those without restenosis. There was a negative correlation between sRAGE and AGEs/sRAGE, TNF-alpha, and sVCAM-1. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy for pre-PCI sRAGE test were 100%, 83%, 85%, 100% and 91% and for AGEs/sRAGE test were 81%, 94%, 93%, 84% and 88%, respectively for identifying patients who developed post PCI restenosis. Measures to attenuate restenosis will be discussed.

Conclusion

Both low serum sRAGE levels and high AGEs/sRAGE ratio have predictive value in identifying patients who may develop post PCI restenosis.

Monday, October 18, 2010
8:30 AM – 9:30 AM
Ninth Scientific Session

Management of Peripheral Arterial Disease

This session focuses on the management of peripheral arterial disease with emphasis on omental therapy in aortic infections and GI fistula, ankle-brachial index and cardiovascular risk, angiogenesis and wound healing, and critical limb ischemia.

Moderators:

David Zeltsman, MD, FICA
Assistant Professor of Surgery, Hofstra-North Shore LIJ Medical School, New York; Chief of Thoracic Surgery, Department of Cardiovascular and Thoracic Surgery, NorthShore-Long Island Jewish Healthcare System, New Hyde Park, New York.

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8:30 **Omental Therapy in Aortic Infections and GI Fistula:** Raymond A. Dieter, Jr., MD, FICA, George Kuzycz, MD, Ray Dieter, III, MD, Robert S. Dieter, MD, RVT, FICA; *Glen Ellyn, Illinois.*

Introduction
Infected aortic lesions, including aneurysms, are uncommon. However, when they occur, the patient has a life or limb threatening lesion that is difficult to correct, and has a corresponding high therapeutic complication rate.

Patients
Over the past 40 years we have seen a large number of vascular patients. A number of these patients have had septic vasculitis either as a primary infection or as a consequence of diagnostic and therapeutic interventions. A review of those patients with intra-abdominal aortic infection concerns and the techniques utilized was performed.

Methods
The charts of patients with septic aortic aneurysms, aortoenteric fistulas, and infected aortic grafts-replacement or endografts, were reviewed. The surgical technique, bacterial agents, and results were reviewed. Early treatments and current approaches were evaluated.

Results
Surgical correction remains a difficult and complicated undertaking. The early axillofemoral bypass results were high risk and low yield procedures in our experience. Our current approach utilizes primary resection of the involved aorta and grafts with in-situ replacement grafts, long-term antibiotic therapy, omental wrap of the new graft and infected areas, and closure of any G-I fistula.

Summary
Septic aortic lesions, whether primary or secondary, may be successfully treated with this technique utilizing in-situ grafting and the omental wrap as an adjunct therapy. Complications including leg amputation, long-term ICU care and multispecialty therapy may be followed by successful long-term survival and functionality.

8:40 **Ankle-Brachial Index Identifies Persons with Cardiovascular Risk in Both Genders:** Päivi E. Korhonen, MD, PhD, FICA, Central Satakunta Health Federation of Municipalities, Harjavalta, Finland; Pertti Aarnio, MD, PhD, FICA, Professor of Surgery; Member, Board of Directors and Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Department of Surgery, Satakunta Central Hospital and University of Turku, Pori, Finland.

Background

Cardiovascular disease accounts for 54% of deaths in European women and 43% of deaths in European men. According to European guidelines, the cardiovascular risk of a person should be assessed using Systematic Coronary Risk Estimation (SCORE) system which estimates the 10-year risk of a first fatal atherosclerotic event, whether a heart attack, a stroke, an aneurysm of the aorta, or other. Sub-clinical atherosclerosis can be assessed measuring ankle-brachial index (ABI). It has been shown that cardiovascular mortality risk is elevated in patients with ABI values <1.00.

Objectives

We aimed at investigating whether cardiovascular risk estimation using SCORE risk charts and ABI measurement is in concordance with mortality statistics.

Methods

We measured ABI, blood pressure, and plasma lipids from 904 (53% women) Finnish subjects aged 45 to 70 years with at least one cardiovascular risk factor, but without established cardiovascular or renal disease or previously diagnosed diabetes. We calculated ABI using the lower instead of the higher ankle pressure, which has been shown to identify more patients at risk with regard to cardiovascular prognosis.

Results

According to SCORE risk charts, 130/481 [27.0% (95% CI: 23.1 to 31.2)] of the women and 267/423 [63.1% (95% CI: 58.3 to 67.7)] of the men ($p < 0.001$) were classified as high risk subjects (SCORE ≥5%). The prevalence of ABI <1.00 was 96/481 [20.0% (95% CI: 16.5 to 23.8)] in women and 75/423 [17.8% (95% CI: 14.2 to 21.7)] in men ($p=0.393$).

Conclusion

SCORE system may underestimate the total cardiovascular risk in women. Measurement of ABI identified comparable number of risk persons in both genders, and it might hold promise to truly identify high-risk individuals.

Monday, October 18, 2010

8:50 **Critical Limb Ischemia:** Robert S. Dieter, MD, RVT, FICA, Editor, *International Journal of Angiology;* Loyola University School of Medicine, Glen Ellyn, Illinois.

Critical limb ischemia (CLI) is a manifestation of peripheral arterial disease (PAD) that describes patients with typical chronic ischemic rest pain. CLI develops when the blood flow does not meet the metabolic demands of tissue at rest. It has been estimated that 150,000 patients require lower-limb amputation for critical leg ischemia in the United States annually. The prognosis after amputation is even worse. In some series, the perioperative mortality is 5% to 10% for below-the-knee amputation and 15% to 20% for above-the-knee amputation. When these patients survive, nearly 40% will die within 2 years of their first major amputation. A second amputation is required in 30% of cases, and full mobility is achieved in only 50% of patients who have below-the-knee amputation and 25% of those who have above-the-knee amputation. It is essential for the treating physician to understand the complexity of patients with CLI. We will attempt to provide a comprehensive review of the understanding of CLI

Monday, October 18, 2010
9:30 AM – 10:30 AM
Tenth Scientific Session

Carotid Interventions

This symposium provides an in-depth review and update on carotid artery interventions with special emphasis on carotid artery stents, carotid endarterectomy, and risk factors predictive of carotid artery stenting-associated microemboli.

Moderator:

Wei Zhou, MD
Associate Professor of Surgery, Stanford University, Stanford, California; Chief, Vascular Surgery, Palo Alto VA Health Care System, Palo Alto, California.

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9:30 **Current State of Carotid Artery Stents and Long-Term Outcome of Carotid Endarterectomy:** John B. Chang, MD, FACS, FICA, Professor of Clinical Surgery, Hofstra North Shore-LIJ School of Medicine, New York; Albert Einstein School of Medicine, New York; Chairman, Board of Directors, International College of Angiology; Editor-in-Chief, *International Journal of Angiology;* Director, Long Island Vascular Center, Roslyn, New York; Attending Surgeon, North Shore-Long Island Jewish Healthcare System, New Hyde Park, New York.

Background
Numerous studies have been published regarding the current state of carotid artery stents (CAS). Now, long-term outcome of carotid endarterectomy (CEA) is available.

Objectives
The author wishes to present peri-operative and long-term results of CEAs with vein patch vs. primary closure. This is a retrospective review of a surgeon's experience at a single center.

Methods
A retrospective review of consecutive 968 CEAs was made. All male patients with an internal carotid artery (ICA) diameter greater than 4 mm received primary closure following CEA (N=176). All female patients, re-do CEAs and male patients with an ICA diameter less than 4 mm received vein patch following CEA. The survival, restenosis (>50% diameter reduction), and stroke rates were determined by the Kaplan-Meier method. Statistical differences were calculated using the Wilcoxon test (P value<0.05).

Results

Peri-operative results; Primary Closure vs Vein Patch

Ipsilateral Stroke Rates	1.7% vs 0.5%
Mortality Rates	2.2% vs 0.3%
Any Stroke or Mortality Rates	3.4% vs 0.76%

The rates from the vein patch group were lower than those rates of the primary closure group (P<0.01).

Long-Term Results (up to 15 years); Primary Closure vs Vein Patch

Ipsilateral stroke free after CEA	Better with vein patch (P, 0.01%)
Ipsilateral stroke free survival after CEA	Better with vein patch (P<0.01%)
Greater than 50% restenosis free rates after CEA	Better with vein patch (P, 0.0004%)
Greater than 50% restenosis rates after CEA in males	Better with vein patch (P<0.0001)

Conclusion
The vein patch group was associated with a lower stroke, restenosis and mortality rate over the primary closure group. During this presentation, some of the technical pitfalls will be discussed in difficult CEAs. A brief review of the current state of CAS will be provided.

9:40 **Mid-Term Outcome of Carotid Stenting for Moderate versus Critical Stenosis:** Josef Veselka, MD, PhD, FESC, FSCAI, FICA, Editor, *International Journal of Angiology;* Petra Zimolová, MD, Lucie Martinkovičová, MD, David Zemánek, MD, Petr Hájek, MD, Martin Malý, MD, PhD, Pavol Tomašov, MD, Jiří Fiedler, MD, Miloslav Špaček, MD, *Martin Šrámek, MD, *Aleš Tomek, MD, PhD, David Tesař, MD, PhD; Cardiovascular Center, Department of Cardiology, University Hospital Motol, Prague, Czech Republic; *Department of Neurology, University Hospital Motol and 2nd Medical School, Charles University, Prague, Czech Republic.

Background

It appears that in patients with only moderate asymptomatic carotid artery stenosis (60-79%) the risk of stroke is of the order of 2% per year or less if they are being treated medically. On the other hand, severe stenoses (≥80%) are probably associated with increased risk of stroke of 4-5% and warrant much more aggressive revascularization.

Objectives

The aim of this study was to compare mid-term clinical outcomes of carotid artery stenting (CAS) in patients treated for moderate (50-89%) versus critical (90-99%) stenoses. This was a retrospective analysis of a single-center registry including 271 consecutive patients (69±9 years, 35% symptomatic, 87% at high-risk for surgery), in whom 308 procedures were performed. The study included both symptomatic (≥50% carotid artery stenosis) and asymptomatic (≥70% carotid artery stenosis) patients. The primary endpoint was the rate of adverse events during follow-up (median 12 months, range 1-48 months), defined as all-cause death or stroke.

Results

We treated 115 critical and 193 moderate stenoses and implanted 318 stents (56% with closed cell design). Embolic protection systems were used in 296 cases (96%). Technical success rate was 98.2% in critical stenoses group and 99% in moderate group, respectively (NS). During follow-up, the incidence of the primary endpoint was 12.9% (13 pts.) in critical stenoses group and 14.7% (25 pts.) in moderate stenoses group (estimated 3-year freedom from death/stroke was 0.844 vs 0.812; log-rank test p = 0.983). Left ventricular ejection fraction <40%, significant contralateral carotid artery occlusion or stenosis and renal insufficiency were identified as significant predictors of the primary endpoint ($p<0.03$).

Conclusion

CAS with embolic protection systems in high-risk patients is effective and safe. Patients with initially moderate and critical stenoses have an identical mid-term prognosis with regard to death and stroke. Therefore, we can hypothesize that the treatment of critical carotid stenoses is in comparison with moderate stenoses more beneficial with the maintenance of acceptable safety.

9:50 **Risk Factors Predictive of CAS-Associated Subclinical Microemboli:** Wei Zhou, MD[1,2], Rosa Zareie, MD[2], Maureen Tedesco, MD[1], Kathleen Gillis, RNP[2], Barton Lane, MD[2,3], Tina Hernandez-Boussard, PhD[1], Allyson Rosen, PhD[4]; Departments of Surgery[1,] Radiology[3] and Psychiatry[4], Stanford University, Stanford, California; [2]VA Palo Alto Health Care System, Palo Alto, California.

Background/Objective

Subclinical microemboli documented on diffusion-weighted magnetic resonance imaging (DWI) are common following carotid artery stenting (CAS) procedures despite absence of neurologic symptoms. There is increased awareness of microembolization being a more sensitive and better outcome measure for carotid interventional procedures. This study was to evaluate risk factors predictive of microemboli in patients undergoing protected CAS with a distal embolic protection device.

Methods

All CAS patients who received pre- and post-procedure MRI evaluations for carotid interventions at a single academic institution from 7/2004 to 12/2008 were examined. Microemboli were defined by new hyper-intensities on postoperative DWI with corresponding decreased diffusion. Risk factors including patient demographics, medical co-morbidities, clinical symptoms, lesion morphologies, and perioperative information were examined and logistic regression analyses were utilized to determine predictors of CAS-related microemboli.

Results

A total of 204 patients underwent carotid interventions (76 CAS and 128 CEA) during the study period and 167 of whom including 67 CAS patients received both preoperative and postoperative MRIs. Among those who underwent protected CAS, the incidence of microemboli was 46.3% despite a relative low incidence of associated neurologic symptoms (2.9 %). Univariate and multivariate regression analyses showed that date of procedure (OR 30.6 and P=0.019) and preoperative TIA symptoms (OR 9.24 and P=0.009) were independent predictors of developing postoperative DWI changes in the ipsilateral hemisphere, while age >76 years was predictive of having new DWI lesions in the contralateral hemisphere (OR 6.11 and P=0.026).

Conclusions

Our study underscores that certain risk factors are significantly associated with CAS-related microemboli and that physician experience and patient selection are essential in improving outcome of CAS procedures.

Monday, October 18, 2010

10:00 **Carotid Endarterectomy—My Way:** Sibu P. Saha, MD, MBA, FICA, Professor of Surgery; President and Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, Local Organizing Committee, 52nd Annual World Congress; Member, International Steering Committee, ICA Research and Education Foundation; Jeff Oldham, MS; Department of Surgery, University of Kentucky, Lexington, Kentucky.

Background
This is a retrospective review of carotid endarterectomy (CEA) on 118 consecutive patients with carotid artery disease.

Objectives
To review 30 days morbidity and mortality following CEA.

Methods
Carotid Endarterectomy—132 CEA operations were performed on 118 patients. Sixty-three patients (53%) were female. The average age was 66 years, ranging from 40 to 84 years. Of the 132 total surgeries performed, 14 involved bilateral procedures. Comorbidities were as follows: hypertension 84%, diabetes 36%, peripheral vascular disease (PVD) 39%, coronary heart disease (CHD) 51%, tobacco abuse 70% and dyslipidemia 71%. Fifty percent of the patients were asymptomatic; the other patients presented with a history of stroke (13%), transient ischemic attack (TIA) (30%), and amaurosis fugax (7%). A right CEA was performed 55% of the time, and a left CEA was performed 45% of the time. A patch was utilized only in two cases, and a shunt was utilized in only four cases or 3%.

Results
In this group of CEA patients, the following complications were noted: bleeding 1.5%, TIA 0.8%, stroke 1.5%. There was not incidence of infection, myocardial infarction, or death.

Conclusion
CEA with selective shunting and rare patching is a safe and effective procedure.

Monday, October 18, 2010
10:45 AM – 12:00 PM
Eleventh Scientific Session

Advances, Controversies, Research, and Latest Concepts in Cardiovascular Medicine & Surgery II

This session will present the management of aortic valve disease, TRALI syndrome, and Type B aortic dissection, and the protective role of Edaravone in ischemic reperfusion leg injury and of heme oxygenase and atrial natriuretic peptide in hypertension-induced renal dysfunction.

Moderators:

Frank Manetta, MD, FICA
Assistant Professor of Surgery, Hofstra-North Shore LIJ School of Medicine, New Hyde Park, NY; Editor, *International Journal of Angiology;* Program Director, Cardiothoracic Surgery, Long Island Jewish Medical Center, New Hyde Park, New York.

Nicolas W. Shammas, MD, MS, FICA
Adjunct Clinical Associate Professor of Medicine, University of Iowa Hospitals, Iowa City, Iowa; Editor, *International Journal of Angiology;* Research Director, Midwest Cardiovascular Research Foundation, Davenport, Iowa.

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10:45 **Fourteen Year Experience with Minimally Invasive Aortic Valve Replacement:** Michael H. Hall, MD, MBA, FICA, Professor of Surgery, NYU School of Medicine, New York, New York; NorthShore-LIJ Health System, Manhasset, New York; Michael P. Hall, BS, MA, University of Kentucky College of Medicine, Lexington, Kentucky.

Background
Since the mid-1990's, minimally invasive surgical advances have provided patients with cardiac procedures providing less pain with limited skin incisions. Many different approaches, some requiring excessively complex equipment and procedures, have been used.

Objectives
The object of this study was to refine a minimally invasive aortic valve replacement (AVR) procedure that would be safe and effective, apply to virtually all lone AVR patients, and be as simple and cost-effective as possible.

Methods
From October 1996 to June 2010, a single surgeon, at a single tertiary care hospital on Long Island, performed 165 mini-invasive AVRs. The first 20 were done with 6-8 cm right parasternal incisions and the remainder with right upper partial sternotomy. All hemodyanmically stable lone AVR candidates were eligible unless pectus present. Technique involves in-chest cannulation, antegrade and/or retrograde cold blood cardioplegia, Biomedicus venous return, and warm blood cardioplegia prior to unclamping to avoid ventricular fibrillation.

Results
There were two deaths in the series unrelated to the procedure. One resulted from over-inflation of a Swan-Ganz catheter balloon in the CTU, resulting in fatal pulmonary artery rupture. The other was due to delayed bowel infarction just prior to discharge. There was one mild CVA in a patient with previous stroke due to watershed injury. There was one wound infection, and no reoperations for bleeding or tamponade. There was no post-operative valve dysfunction confirmed by intra-op TEE and post-op TTE.

Results
Minimally invasive AVR is a safe and effective procedure, and can be performed with a minimal amount of specialized equipment in virtually all lone AVR patients. Outcomes are at least equal to the best full sternotomy results reported, and are more acceptable to medically demanding health care consumers. We believe that this procedure will continue to be of value as the concept of opening a valve percutaneously within a calcified mass or scar tissue is likely to remain suboptimal.

Monday, October 18, 2010

10:55 **A Surgical Disaster: TRALI Syndrome Complicated by Retroperitoneal Bleeding in a Patient with Single Lung Physiology:** Vijay Singh, MD, David Zeltsman, MD, FACS, FICA, Assistant Professor of Surgery, Hofstra North-Shore School of Medicine; Chief of Thoracic Surgery; Department of Cardiovascular and Thoracic Surgery, Long Island Jewish Medical Center, NorthShore-LIJ Health System, New Hyde Park, New York.

Purpose

Transfusion Related Acute Lung Injury (TRALI) is an under-diagnosed and under-reported syndrome, which by itself is the third leading cause of transfusion related mortality. The incidence of TRALI is reported to be 1 in 2000 to 5000 transfusions. When combined with uncontrollable bleeding, survival is unachievable.

Methods

A 25-year old male, who underwent open heart surgery as an infant to correct his congenital heart disease in association with right pulmonary artery atresia, presented with hemoptosis secondary to aspelioma and required a pneumonectomy of the non-functional right lung. During pneumololysis, significant bleeding occurred from the superior vena cava. The patient required a blood transfusion. To control bleeding, the patient was placed on cardio-pulmonary bypass. Simultaneous occurrence of severe pulmonary edema and retroperitoneal bleeding were noted.

Results

Approximately 8 liters of frothy edema fluid were drained from the only functional left lung starting approximately 15 minutes after the transfusion and lasting for several hours until the end of the case. It most likely represented TRALI syndrome. Increasing abdominal girth and poor volume return to the pump were consistent with and pathognomonic for retroperitoneal bleeding. However, primary surgical bleeding in the chest was controlled successfully and a pneumonectomy was performed without further difficulty. We were unable to separate the patient from cardiopulmonary bypass due to the inability to oxygenate. At the same time, we could not reverse the heparin to control the retroperitoneal bleeding. After multiple unsuccessful attempts the patient succumbed.

Conclusion

This ill-fated case demonstrates the quandary of obtaining vascular access for emergency cardiopulmonary bypass while in the right thoracotomy position. It may be beneficial to have both the femoral artery and vein cannulated prior to positioning a patient in a lateral decubitus position. In addition, adult ECMO may be indicated if faced with such severe pulmonary edema without ongoing hemorrhage.

11:05 **Type B Aortic Dissection Treated with an Endovascular Separated Stent-Graft System—A Single Center Experience:** Iwan Dakota, MD, FICA, Regional Secretary, Membership Committee, International College of Angiology; Hananto Andriantoro, MD, FICA, Ismoyo Sunu, MD, FICA, RWM Kaligis, MD, FICA Ganesja Mulia Harimurti, MD; National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.

Background

Thoracic aortic dissection is very dangerous disease, and could lead to a catastrophic condition without the proper management. Endovascular procedures to treat thoracic aortic dissection have been widely accepted for type B aortic dissection, particularly in those patients at high risk for an open surgical procedure. Unfortunately, the current commercially available stent grafts almost always have a relatively big delivery system, which leads to some problems during delivery and deployment, especially for most Asian people, who have a relatively smaller caliber of iliac and femoral arteries. To avoid this problem, a smaller profile of delivery system is one of the solutions in terms of reducing the risk of failure during delivery and deployment of aortic stent grafts.

Aim

The aim of this study is to determine the safety, short- and mid-term outcome of type B aortic dissection/descending thoracic aortic dissection (DTA), repaired with an endovascular separated aortic stent graft system.

Method

Between August 2004 and December 2009, 26 patients with acute (13 pts) and sub-acute (13 pts) type B aortic dissection underwent treatment with a separated stent graft (Seal®, S&G Co., Korea). There were 23 men and 3 women with a median age of 61.2 years (46-72 yrs). High resolution contrast CT together with digital subtraction angiography were performed to investigate the anatomy of the thoracic aorta. The majority of patients had comorbid illnesses such as hypertension (100%), coronary artery disease (CAD) in 8 pts (30.8%), and diabetes mellitus (DM) in 4 pts (15.4%). All patients presented with uncontrolled hypertension. The duration of the follow-up period ranged from 6 to 48 months (median 24 months).

Results

A transfemoral approach with 12-14 Fr sheath with local anethesia to the bilateral groin were applied in all cases. Endovascular repair was performed by a proximal landing zone which varied from 1.5 to 3.0 cm. The technical success rate was 88.5%(23pts). Neither aortic dissection related mortality or immediate conversion to open surgical repair occurred during the follow-up period. One patient did not require limb extensions, due to a localized fusiform aneurysm which did not involve the iliac bifurcation. The endoleak rate was 15.4% (4pts) during a one month follow-up period. Secondary intervention was required in 1 patient (3.8%), and unilateral graft limb occlusion was found in 1 patient (4.2%).

Conclusions

The application of endovascular separated aortic stent grafts revealed a safe and high technical success rate of type B aortic dissection. A low peri-operative morbidity and mortality rate was found during short- and mid-term outcome.

11:15 **Edaravone Reduces Mitochondrial Damage due to Reperfusion Injury Following Leg Ischemia in Rats:** Mitsuhiro Yamamura, MD, FICA, Co-chairperson, Membership Committee, International College of Angiology;Yuji Miyamoto, MD, Masataka Mitsuno, MD, Hiroe Tanaka, MD, Masaaki Ryomoto, MD, Shinya Fukui, MD, Yoshiteru Yoshioka, MD; Department of Cardiovascular Surgery, Hyogo College of Medicine, Nishinomiya-city, Hyogo, Japan.

Background

Free-radicals cause reperfusion injury following leg ischemia. We have reported that free-radical scavenger, edaravone (Radicut®, Mitsubishi Tanabe Pharma Co., Japan), suppressed reperfusion injury following leg ischemia in rats.

Objectives

In this study we aimed to elucidate how edaravone suppresses reperfusion injury, focusing on mitochondrial structure of muscles using transmission electronic microscope (TEM).

Methods

Preoperatively, male Lewis rats (632 ± 89 gm) were administrated an intraperitoneal injection of edaravone (3.0 mg / kg, edaravone group, n = 3) or the same dose of saline (control group, n = 3). Rat reperfusion injury models were made by clamping bilateral common femoral arteries for 5 hours and then declamping. After 5 hours, using a diamond knife, the lower extremity muscles were immediately harvested, and cut transversely to the muscle fiber. We evaluated the mitochondrial structure at x30,000 magnification using TEM (JEM-1220, Nippon Denshi Co., Japan). The mitochondrial damage was defined as the mitochondrial size (μm^2) on computerized densitometry (NIH Image J 1.37). In one rate, the mitochondrial size measured 14. Therefore, the total number in each group was 52.

Results

The mitochondria in the control group demonstrated a large of amount of swelling (mean mitochondrial size = 0.169 ± 0.01 μm^2). However, the mitochondria in the edaravone group demonstrated only a small amount of swelling (mean mitochondrial size = 0.102 ± 0.05 μm^2, $p < 0.01$). In addition, the mitochondria in the control group lost many folds. Whereas, the mitochondria in the edaravone group maintained normal folds.

Conclusion

Our TEM results suggest that edaravone reduces mitochondrial damage, which was due to reperfusion injury following leg ischemia in rats.

This study was supported by a Grant-in-Aid for Researchers, Hyogo College of Medicine, Japan, 2010.

11:25 **Heme Oxygenase and Atrial Natriuretic Peptide Suppresses Hypertension-Induced Renal Dysfunction:** Joseph F. Ndisang, PhD, FICA, A. Jadhav; Department of Physiology, University of Saskatchewan College of Medicine, Saskatoon, Canada.

Background

Deoxycorticosterone-acetate (DOCA)-salt hypertension is an experimental model of mineralocorticoid-induced hypertension characterized by elevated fibrosis and severe renal lesions. The role of the heme oxygenase (HO) system and atrial-natriuretic peptide (ANP) was investigated.

Methods

HO was enhanced with heme-arginate (HA) or blocked with chromium-mesoporphyrin (CrMP). Histological, morphological/morphometrical, quantitative-RT-PCR, Western blot, EIA and spectrophotometric analysis were used.

Results

HA normalized blood pressure reduced renal hypertrophy, fibrosis, and histopathological lesions, including glomerulosclerosis, glomerular hypertrophy, glomerular atrophy, and renal-arteriolar thickening. These were associated with significant elevation of HO activity, cGMP, atrial-natriuretic peptide (ANP) and adiponectin, whereas oxidative mediators like 8-isoprostane and endothelin-1 (ET-1) were markedly reduced. Corresponding HA suppressed proteinuria, and albuminuria, and thus improved of renal function.

Conclusion

Since the HO system elicits cytoprotection by potentiating cyclic guanosine monophosphate (cGMP)-signaling, and the effects of ANP are largely mediated via guanylate-cyclase-GMP, the synergistic potentiation of the HO system and ANP may account for the suppression of renal lesions and corresponding improvement of renal function in DOCA-hypertension.

Monday, October 18, 2010

12:00 PM – 1:00 PM

Twelfth Scientific Session

Professor John B. Chang Research Achievement Award

The Professor John B. Chang Research Achievement Award is presented annually to a Fellow of the International College of Angiology in recognition of excellence in research and scholarly activity.

A Special Luncheon Session

Asking Questions at the Bedside—Clinicians Path to Research

Introduction By:

John A. Elefteriades, MD, FICA

William W.L. Glenn Professor of Cardiothoracic Surgery; Vice Chairman and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Section of Cardiothoracic Surgery, Yale University School of Medicine, New Haven, Connecticut.

Presentation By:

Victor A. Ferraris, MD, PhD, FICA

Tyler Gill Professor of Surgery; Secretary General and Member, Board of Directors, International College of Angiology; Editor, *International Journal of Angiology;* Division of Cardiothoracic Surgery, University of Kentucky College of Medicine, Lexington, Kentucky.

Monday, October 18, 2010
1:00 PM – 2:00 PM
Thirteenth Scientific Session

Management of Acute Coronary Syndrome: Different Points of View Across the Ocean

This session will provide the viewpoints of European and North American health care providers on the management of acute coronary syndrome.

Moderators:

Otmar M. Pachinger, MD, FESC, FAHA, FICA
Professor of Medicine; Chief of Cardiology, Medical University of Innsbruck, Innsbruck, Austria.

Edward Ross, MD, FICA, FACC
Member, Board of Directors, International College of Angiology; Co-Chairman, Scientific Committee, International College of Angiology; Editor, *International Journal of Angiology;* Past Co-Director, Cardiovascular Program-Clarian Health Partners, Methodist Hospital; Past Co-Medical Director, Cardiac Cath. Lab. and Cardiovascular Services, Methodist Hospital; Senior Cardiologist, Methodist Cardiology Physicians, Indianapolis, Indiana.

Presentations By:

David Moliterno, MD
Professor of Medicine; Chief, Division of Cardiovascular Medicine, University of Kentucky College of Medicine, Lexington, Kentucky; Medical Director, Linda and Jack Gill Heart Institute, Lexington, Kentucky.

vs

Joseph Veselka, MD, PhD, FESC, FSCAI, FICA
Professor of Medicine; Editor, *International Journal of Angiology;* Chief, Cardiovascular Center, University Hospital Motol, Prague, Czech Republic.

Monday, October 18, 2010
2:00 PM – 3:00 PM
Fourteenth Scientific Session

Scientific Poster Presentations

This poster session describes recent developments in the treatment of vascular diseases and the role of angiotensin II in the pathophysiology of aortic aneurysms.

Moderators:

John A. Elefteriades, MD, FICA
William W.L. Glenn Professor of Cardiothoracic Surgery; Vice Chairman and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Section of Cardiothoracic Surgery, Yale University School of Medicine, New Haven, Connecticut.

Rajinder P. Sharma, MD, FICA
Treasurer and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, International Steering Committee, ICA Research and Education Foundation; Division of Vascular and Interventional Radiology, Henry Ford Hospital, Detroit, Michigan.

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2:00 **Intermediate-Term Outcomes of Patients Treated with the Zotaroliums-Eluting (Endeavor) Stent at a Tertiary Medical Center:** Nicolas W. Shammas, MD, MS, FICA, MS, Gail A. Shammas, BS, RN, Michael Jerin, PhD, Susan Meriner, MD, Midwest Cardiovascular Research Foundation, Davenport, Iowa.

Background
The Endeavor (Medtronic) zotarolimus-eluting stent (ZES) has shown favorable results in reducing target lesion revascularization (TLR) and vessel failure (TVF) in several registries and randomized trials. We report our experience with ZES in a series of patients at our medical center with intermediate-term follow-up and compare our data to the ZES performance in the E-registry.

Methods
Data on 249 consecutive patients (224 vessels, 380 segments) stented with ZES were retrospectively analyzed. All patients were included except those with a stented bypass graft. The primary endpoint of the study was TVF defined as the combined endpoint of cardiac death, non fatal myocardial infarction and TLR. Secondary endpoints included TLR, target vessel revascularization (TVR), acute stent thrombosis (ST) as defined by the academic research consortium (ARC), total death, cardiac death, non fatal myocardial infarction (MI), and stroke. In the first 152 consecutive patients angiograms were reviewed by an independent cardiologist, and a SYNTAX score performed. Follow-up was achieved either from medical records and/or by phone calls at a mean of 263.0 $\pm$ 108.7 days. Descriptive analysis was performed on all variables with mean $\pm$ SD for continuous variables and percentages for dichotomous variables.

Results
Patients had the following characteristics: age (66.5 $\pm$ 12), prior PCI (71.9%), prior CABG (26.4%), prior MI (31.1%), diabetes (37.9%), clopidogrel (96.5%) and aspirin (95.2%) on follow up, stents per patient (2.7 $\pm$ 1.4), bifurcating non left main lesions (30%), bifurcating and trifurcating left main (15.2%), mean SYNTAX score (14.3 $\pm$ 9.7), range SYNTAX score (1 to 44.5), vessel diameter (2.8 $\pm$ 1.5), lesion > 20 mm (46.2%), angiographic calcium (30.8%), and restenotic lesions (27.2%). On follow-up TVF was met in 22.2% of patients. The secondary endpoints were as follows: TLR (15.1%), TVR (22.4%), non fatal MI (4%), stroke (1.2%), definite stent thrombosis (1.3%), possible stent thrombosis (0.4%), and cardiac death 2.6%. Patients underwent TLR for recurrence of chest pain or dyspnea (71.4%), abnormal stress test (14.3%) and as part of a staged procedure or left main surveillance angiogram (13.5%). Compared to the historic E-registry (TLR and TVF of 4.5% and 7.2% respectively), our registry had more left main lesions (15.2% vs 2.4%), longer lesions > 20 mm (46.2% vs 30.4%), more in-stent restenosis (27.2% vs 4.8%), bifurcating lesions (30% vs 18.9%) and prior PCI (70.4% vs 25.3%).

Conclusion
The ZES had a higher than expected TLR and TVF in our series in contrast to data from other registry. This might be explained based on the presence of a high percentage of unfavorable angiographic characteristics in the treated patients and/or the high TLR in asymptomatic patients driven by abnormal stress testing, surveillance procedures for left main disease or during staged procedures.

2:10 **Late Retrograde Type A Aortic Dissection with Rupture after Repair of Type B Aortic Dissection with a Gore TAG Endovascular Prothesis:** M.A. Ajakaiye, MD, S.J. Scheinerman, MD, Frank Manetta, MD, FICA, Editor, *International Journal of Angiology;* Long Island Jewish Medical Center, New Hyde Park, New York; North Shore University Hospital, Division of Surgical Research, Feinstein Institute of Medical Research, Manhasset, New York.

Background
Acute aortic dissection is the most common catastrophic condition of the aorta. Treatment options include open surgery and thoracic endovascular aortic reconstruction (TEVAR).

Objectives
We present the first reported case in the United States of a late unforeseen complication of the management of descending aortic dissections TEVAR.

Methods
We performed a retrospective chart review of a female patient who presented with late retrograde type A aortic dissection 4 months after TEVAR of a type B aortic dissection, and review of medical literature.

Results
The patient was initially managed non-operatively but had TEVAR placement of a Gore TAG endograft for failure of medical therapy. She presented at our institution 4 months later with a type A aortic dissection and hemo-pericardium. The endograft had eroded through the medial aspect of her distal aorta arch. She had emergent hemi-arch replacement incorporating the endograft and the distal aorta. The patient was weaned from bypass, and transferred to the ICU where she became asystolic despite aggressive resuscitation. She had no evidence of bleeding, re-dissection or other pathology on mediastinal exploration. Her family refused an autopsy.

Conclusion
TEVAR of the thoracic aorta is a viable treatment option for the management of complicated descending thoracic aortic dissections. Careful patient selection is necessary as medical therapy successfully treats the majority of uncomplicated type B dissections. TEVAR should be reserved for patients with complicated type B dissections or those who fail non-operative management. Close post-operative monitoring is necessary when TEVAR is performed and should be accompanied by lifelong surveillance. A high level of suspicion is important to identify retrograde Type A dissections in these patients given its rarity and the ambiguity of its clinical presentation.

2:20 **Angiotensin II Infusion Promotes Progressive Dilation of Ascending Aorta Independent of Hypercholesterolemia:** Debra L. Rateri BS,[1] Anju Balakrishnan MS,[1] Deborah A. Howatt BS,[1] Jessica J. Moorleghen BS,[1] Lisa A. Cassis PhD,[2] Alan Daugherty, PhD DSc [1,2]; [1]Saha Cardiovascular Research Center, [2]Graduate Center for Nutritional Sciences, University of Kentucky, Lexington, Kentucky.

Background

We previously demonstrated that angiotensin II (AngII)-infusion into hypercholesterolemic mice promotes development of thoracic aortic aneurysms in which profound dilation is highly localized to the ascending aorta. However, we have not defined the sequential changes during the AngII infusion, and if these changes are influenced by hypercholesterolemia.

Objectives

The aims of this study were to define the progression of morphological changes of the ascending aorta during AngII infusion and determine the influence of hypercholesterolemia.

Methods

Male C57BL/6 and LDL receptor -/- mice, fed a saturated fat-enriched diet, were infused with AngII (1,000 ng/kg/min) subcutaneously. Mice were terminated at 0, 5, 15 and 28 days of AngII infusion (N=4/genotype/time point). Aortas were perfusion fixed in vivo and harvested. Thoracic aortic dimensions were measured then tissues were sectioned serially. Movats pentachrome was used to stain extracellular matrix elastin fibers. Immunostaining was used to identify macrophages (CD68) and smooth muscle cells (alpha actin).

Results

In both C57BL/6 and LDL receptor -/- mice, within 5 days of infusion, the intimal area of ascending aortas increased and both media and adventitia were thickened. Ulceration of the anterior aspect of the aorta was discernable after 5 days of AngII infusion. Ascending aortas increased in size progressively and equivalently in both strains of mice during the 28 days of AngII infusion. Medial thickening was frequently attributable to intralamellar hemorrhage that restricted to the adventitial aspect of aortas. Macrophages were increased abundance in the media with increased duration of AngII infusion.

Conclusions

AngII infusion promotes rapid and progressive aneurysms in the ascending aorta that are characterized by early intralamellar hemorrhage and ulceration. This pathology is equivalent in normo- and hypercholesterolemic mice.

2:30 **Telomerase-Deficiency in Bone Marrow-Derived Cells Attenuates Angiotensin II-Induced Abdominal Aortic Aneurysm Formation:** Hannes M. Findeisen, MD, Florence Gizard, Yue Zhao, Karrie L. Jones, Elizabeth B. Heywood, Deborah A. Howatt, Alan Daugherty, PhD, DSc, Dennis Bruemmer; Saha Cardiovascular Research Center, Lexington, Kentucky.

Background

Telomerase maintains the stability of telomeres, DNA-protein complexes that protect the ends of chromosomes. Additionally, accumulating evidence suggests a critical role of the catalytic core telomerase reverse transcriptase (TERT) for multiple cellular processes and the activation of gene expression programs.

Objectives

In this study, we investigated the role of macrophage expression of TERT in inflammatory remodeling underlying angiotensin II (AngII)-induced aortic abdominal aneurysm (AAA) formation.

Methods

LDL receptor-deficient male mice were lethally irradiated and reconstituted with bone marrow-derived cells from TERT-deficient (n = 7) or littermate wild type (n = 10) mice. Four weeks after irradiation, mice were placed on a Western diet enriched in cholesterol and infused with AngII (1,000 ng/kg/min). After 4 weeks, suprarenal abdominal aortic diameter and area were quantified in vivo by ultrasound and ex vivo by morphometric analysis.

Results

Repopulation with TERT-/- cells profoundly reduced AngII-induced AAA formation. The mean maximal suprarenal aortic diameter in vivo was 1.17 mm in mice repopulated with TERT+/+ cells compared to 1.00 mm in mice repopulated with TERT-/- cells ($p = 0.008$). Abdominal aortic areas were 1.10 mm^2 in mice repopulated with TERT+/+ cells compared to 0.78 mm^2 in mice repopulated with TERT-/- cells ($p = 0.009$). In contrast to mice repopulated with TERT+/+ cells, AngII-infusion did not increase aortic diameter or area in mice repopulated with TERT-/-cells compared to baseline. Ex vivo mean maximal aortic diameters were 1.20 mm in mice repopulated with TERT+/+ cells and 0.95 mm in mice repopulated with TERT-/-cells ($p = 0.001$). This attenuation of AAA formation occurred in the absence of significant changes in cholesterol distribution, leukocyte number, or leukocyte telomere length. Interestingly, in vitro TERT-/- bone marrow-derived macrophages revealed decreased MMP-2 expression and activity in response to AngII incubation.

Conclusion

TERT-deficiency in bone marrow-derived cells significantly reduced AngII-induced AAA formation in LDL receptor-deficient mice and exhibited altered expression of MMP-2 in vitro. These results suggest a previously unrecognized role of TERT in the pathogenesis of AAA and warrant further research on the role of telomerase in vascular biology.

Tuesday, October 19, 2010

7:30 AM – 8:15 AM

Fifteenth Scientific Session

An Overview of Vascular Embolotherapy

A Special Breakfast Session

This special lecture will provide an overview of vascular embolotherapy.

Introduction By:

John B. Chang, MD, FACS, FICA, *Program Chairman*

Professor of Clinical Surgery, Hofstra North Shore-LIJ School of Medicine, New York; Albert Einstein School of Medicine, New York; Chairman, Board of Directors, International College of Angiology; Editor-in-Chief, *International Journal of Angiology;* Director, Long Island Vascular Center, Roslyn, New York; Attending Surgeon, North Shore-Long Island Jewish Healthcare System, New Hyde Park, New York.

Moderator:

Professor Austin Leahy, FRCSI, MCh

Associate Professor of Surgery and Consultant Vascular Surgeon, Beaumont Hospital, Dublin, Ireland; Professor of Health Sciences and Management, Royal College of Surgeons in Ireland; Editor-in-Chief, The Surgeon: Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland.

Presentation By:

David N. Siegel, MD, FSIR, FICA

Assistant Professor of Radiology, Albert Einstein College of Medicine, and Hofstra-North Shore LIJ School of Medicine, New York; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* Chief, Division of Vascular and Interventional Radiology, NorthShore-LIJ Health System, New Hyde Park, New York.

The objectives of this special presentation are:

- To review the history of embolization and the development of the embolic agents.
- To describe the various embolization agents and review their indications.
- To review the evolution of mechanical embolics and their role in embolization.
- To review the evolution of particulate embolic agents and their role in embolization
- To illustrate the use of all the agents discussed utilizing demonstrative cases.

Tuesday, October 19, 2010
8:15 AM – 9:00 AM
Sixteenth Scientific Session

Tricks of the Trade

This session discusses the "tricks of the trade" in endovascular repair with challenging anatomy, and EVAR with technical pitfalls.

Moderators:

Iwan Dakota, MD, FICA
Regional Secretary, Membership Committee, International College of Angiology; Department of Cardiology and Vascular Diseases, National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.

John A. Elefteriades, MD, FICA
William W.L. Glenn Professor of Cardiothoracic Surgery; Vice Chairman and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Member, International Steering Committee, ICA Research and Education Foundation; Chief, Section of Cardiothoracic Surgery, Yale University School of Medicine, New Haven, Connecticut.

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8:15 **Branch Vessel Preservation during Endovascular Aneurysm Repair in Challenging Anatomy:** David J. Minion, MD, Associate Professor, Division of General Surgery, UK Healthcare, University of Kentucky, Lexington, Kentucky

Endovascular Aneurysm Repair (EVAR) provides decreased early morbidity and mortality compared to traditional open repair. However, seal can be compromised during EVAR in patients with hypogastric or visceral involvement of the aneurismal segment. We review our experience with the "trifurcated" technique or hypogastric preservations as well as a modified "snorkel" technique and a "splinter" (or branched) technique for visceral involvement during EVAR in patients with challenging anatomy.

8:30 **How I Do It—EVAR with Technical Pitfalls:** Hermann W. Kaebnick, MD, RVT, FACS; Baptist Hospital East, and VA Hospital, Louisville, Kentucky.

Objective
The objective of this presentation is to provide a personal experience of technical issues involving the use of Powerlink in EVAR.

Methods
One hundred eighty patients were treated with Powerlink for infrarenal aortic aneurysm disease from 2005-2010. Unibody device placement is compared to experience of modular endovascular aneurysm repair in 1700 patients from 1995-2010.

Results
Aortic bifurcation fixation with a Unibody Endoskeleton device provides different anatomic considerations and technical issues. Low Type II endoleak rate with high sac regression rate provides a comparable alternative to modular repair.

Conclusion
Endovascular aortic aneurysm repair is a constantly evolving technique with many challenges and future technologic innovations.

Tuesday, October 19, 2010
9:00 AM – 10:30 AM
Seventeenth Scientific Session

Management of Venous Disease

The focus of this session is on the management of venous disease with a special reference to acute iliofemoral thrombosis and saphenous vein insufficiency. It will also provide an insight into venous physiology and the financial aspects as it relates to the care of venous disease.

Moderator:

Eleftherios Xenos, MD, PhD, FICA
Assistant Professor of Surgery; Local Organizing Committee Member, 52nd Annual World Congress, International College of Angiology; Division of General Surgery, University of Kentucky College of Medicine, Lexington, Kentucky.

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9:00 **Pharmacomechanical Thrombolysis for Acute Iliofemoral Thrombosis and Treatment Options for Chronic Venous Outflow Obstruction:** Antonios P. Gasparis, MD, RVT, Associate Professor of Surgery, Stony Brook University Medical Center, Stony Brook, New York.

Background and Objectives

Standard of care for patients with acute deep vein thrombosis is anticoagulation. Failure to remove thrombus early results in reflux and obstruction, which may lead to long-term morbidity with post-thrombotic symptoms. Early thrombus removal with thrombolysis has been shown to prevent valvular dysfunction and venous obstruction, which in some studies has resulted in improved in QoL.

Patients with iliofemoral thrombosis who are treated with anticoagulation alone may not recanalized their iliac veins and develop venous outflow obstruction. These are the patients who are more likely to develop advanced postthrombotic syndrome. Late treatment of their obstruction with venous stenting has been successful in relieving their proximal obstruction.

The objectives of the presentations include to review the literature on pharmacomechanical thrombolysis, review indications for thrombolysis, who are the candidates for treatment, present the different devices that are currently available for early thrombus removal and discuss how to develop a practice. In addition we will discuss technical aspects and data on treatment of venous outflow obstruction with venous stenting.

9:20 **Venous Imaging—Physiology—Diagnosis:** Nicos Labropoulos, MD, Professor of Surgery and Radiology, Stony Brook University Medical Center, Stony Brook, New York.

Venous obstruction and reflux are the main pathologies leading to venous hypertension, which causes the signs and symptoms of chronic venous disease (CVD). The etiology of CVD is poorly understood. During the physical exam many of the signs and symptoms of CVD can be detected but it is not adequate by itself to instigate treatment.

Several tests are being used to evaluate the venous system. Plethysmography is used in the assessment of the amount of reflux, efficiency of calf muscle pump and obstruction. Phlebography is used when there is a need for endovenous therapy and deep vein reconstruction. Duplex ultrasound has become the test of choice for the evaluation of CVD in most patients, as it is safe, non-invasive, cost-effective, and reliable.

The CEAP classification was developed by the AVF in 1994 and revised in 2004 to delineate the severity of CVD, improve standards for reporting, and develop treatment plans for various stages of the disease. It relies on the four components of clinical signs (C), etiology (E), anatomy (A), and pathophysiology (P). Both the physical exam and the diagnostic tests are utilized to report the patient's condition before and after treatment.

Obstruction

The most common cause of obstruction is venous thrombosis. Other pathologies such as tumors, hematomas, cysts, aneurysms and musculoskeletal structures can cause extrinsic vein compression. Deep vein thrombosis (DVT) is a significant cause of morbidity and mortality. In the acute phase the patient can develop pulmonary embolism and pulmonary hypertension.

Post-thrombotic syndrome (PTS) is a term used to describe the sequellae of CVD after an episode of thrombosis. The typical findings on examination are pain, burning sensation, itching, varicose veins, chronic limb swelling, skin discoloration, and ulceration. After a single episode of DVT, the incidence of PTS has been reported to be from 23 to 79% whereas a large prospective study showed an incidence of about 25% at 5 years. Ipsilateral recurrent DVT has shown to increase the odds for developing PTS by 4 to 6 times.

Reflux

Venous reflux is the reversal of flow in the veins of the lower extremity. Physiologic reversal of flow accounts for the fraction of the second it takes for the valve leaflets to close. A prospective study has demonstrated that the acceptable physiologic reversal of flow is different for various venous systems in the lower limb. The cutoff value for reflux in the common femoral, femoral, and popliteal vein is >1000 ms. For the superficial veins, deep femoral, deep calf axial and muscular veins the value is 500 ms and in the perforating veins it is 350.

There is a differentiation between primary, secondary and congenital reflux. This classification is based on the pathophysiology of the reflux. Congenital reflux exists since birth but rarely recognized early since there is a lag in the presenting signs and symptoms. Secondary reflux is most often the result of thrombosis. The most common type of reflux is primary since the causes have not yet been determined. Two studies that have used the CEAP classification to investigate the causes of CVD, showed that congenital accounts for 1-3%, secondary in 18-28%, and primary in 64-79% of patients.

Tuesday, October 19, 2010

9:40 **Current Status of Saphenous Vein Insufficiency Treatment:** Eleftherios Xenos, MD, PhD, FICA, Assistant Professor of Surgery; Local Organizing Committee Member, 52nd Annual World Congress, International College of Angiology; University of Kentucky Medical Center, Lexington, Kentucky.

Background and Objectives

Saphenous vein reflux is associated with leg edema, varicosities, and impairment of quality of life. Potential treatment options include stripping, endovenous ablation and injection of sclerosing agents. The objective of the presentation is to present an update of these various treatment options in terms of abolition of reflux and symptoms, recurrence and associated morbidity.

Tuesday, October 19, 2010

9:50 **Motion of Blood in the Veins is Pulsatile—A New Finding:** Dinker B. Rai, MD, FACS, FRCS(C), FICA, Associate Clinical Professor, SUNY Downstate Medical Center, Brooklyn, New York; Editor, *International Journal of Angiology;* Chief of Vascular Surgery, Interfaith Medical Center, Brooklyn, New York; Visiting Professor Rajive Gandhi University, Bangalore, India.

Data
This presentation is based on experimental evidence.

Module
This study was conducted on 5 mongrel dogs. They were anesthetized and kept in an erect posture.

Methods
Separate catheters were inserted into the inferior vena cava, right atrial chamber of the heart, right ventricle of the heart, and the Femoral arteries. All subjects were connected to a monitor and simultaneous pressure changes were recorded with graphic tracings.

Findings
Graphic tracings in the vena cava demonstrated a rhythmic upward and downward graphic curve concurring with the atrial diastole. Upward and downward graphic curves in the femoral artery concur with the ventricular systole.

Interpretation
Interpretation will be discussed in the presentation.

Tuesday, October 19, 2010
10:45 AM – 12:00 PM
Eighteenth Scientific Session

Interventional Radiology and Cardiology

This session discusses the therapeutic modalities for abdominal aortic aneurysms, thoracic aortic dissections with retro-esophageal right brachiocephalic anatomy, abdominal aortic aneurysms with a tortuous delivery vessel, thoracic endovascular aortic repair with an anomalous region of the left vertebral artery, and interventional management of a stroke.

Moderators:

Patrizio Capasso, MD, DSc
Professor of Radiology; Local Organizing Committee Member, 52nd Annual World Congress, International College of Angiology; Chief, Division of Vascular and Interventional Radiology, University of Kentucky College of Medicine, Lexington, Kentucky.

Hitoshi Hirose, MD, PhD, FACS, FICA
Assistant Professor of Surgery; Co-Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Division of Cardiothoracic Surgery, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania.

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10:45 **Separated Aortic Stent Graft System to Treat Abdominal Aortic Aneurysms—Short- and Long-Term Results:** Iwan Dakota, MD, FICA, Regional Secretary, Membership Committee, International College of Angiology; Hananto Andriantoro, MD, FICA, Ismoyo Sunu, MD, FICA, RWM Kaligis, MD, FICA, Ganesja Mulia Harimurti, MD; Department of Cardiology and Vascular Disease, Faculty of Medicine, University of Indonesia, National Cardiovascular Center Harapan Kita Hospital, Jakarta, Indonesia.

Background

Abdominal aorta aneurysms (AAAs) are a dangerous and catastrophic situation which could lead to a high mortality rate if not properly managed. Over the last two decades, percutaneus endovascular procedures to treat AAAs have been widely accepted, particularly in those patients with a high risk for open surgical procedures. The current commercially available stent grafts come with relatively large delivery system. Due to the size of the delivery system, this at times can create a problem during delivery or deployment in the Asian population, due to the relatively small caliber of femoral arteries. A smaller profile delivery system is one of the preferred options to reduce the risk of failure during delivery or deployment of stent grafts.

Aim

The aim of this study was to determine the safety, and short- and mid-term outcome of abdominal aortic aneurysms (AAAs) repaired with a separates aortic stent graft system.

Methods

Between August 2004 and December 2009, 24 patients with infrarenal AAA underwent treatment with separated stent grafts(Seal®, S&G Co., Korea). There were 20 men and 4 women with a median age of 63.6 years. The anatomy of the abdominal aorta and iliac arteries were investigated with high resolution contrast CT together with digital subtraction angiography. The majority of patients had comorbidities such as hypertension (95.8%), CAD (37.5%) and DM (16.7%). The follow-up period ranged from 6 to 48 months (median 26 months).

Results

Endovascular repair was performed by a transfemoral approach with 12-14 Fr sheath. Local anethesia to the bilateral groin was applied in all cases. The proximal landing zone varied from 1.5 to 3.0 cm. Technical success rate was 91.7% (22pts). There was no aneurysm related mortality in the post-operative period. There was no immediate conversion to open surgical repair. One patient did not need limb extensions, due to a localized fusiform aneurysm not involving the iliac bifurcation. Endoleak rate was 16.7% (4pts) at 1 month during the follow-up period. Secondary intervention was required in 4.2% of the patients (1 pts), and a unilateral graft limb occlusion was found in 1 patient (4.2%).

Conclusion

Endovascular separated aorta stent grafts revealed a safe and high degree of technical success in the repair of AAAs, with a very low peri-operative morbidity and mortality rate in both short- and mid-term outcomes.

Tuesday, October 19, 2010

10:55 **Transjugular Intrahepatic Portosystemic Shunt (TIPS)—How I Do It:** Rajinder P. Sharma, MD, FICA, Treasurer and Member, Board of Directors, International College of Angiology; Co-Chairperson, Scientific Committee, International College of Angiology; Editor, *International Journal of Angiology;* Chairman, International Steering Committee, ICA Research and Education Foundation; Division of Vascular and Interventional Radiology, Henry Ford Hospital, Detroit, Michigan.

A Transjugular Intrahepatic Porto Systemic shunt (TIPS) is a percutaneously created connection within the liver between the portal and systemic circulations.

A TIPS is placed to reduce portal pressure in patients with complications related to portal hypertension. In patients with end stage liver disease, this procedure has emerged as a less invasive alternative to surgery. The goal of TIPS placement is to divert portal blood flow into the hepatic vein, so as to reduce the pressure gradient between the portal and systemic circulations. Shunt patency is maintained by placing an expandable metal stent across the intrahepatic tract.

In 1969 Rosch was first to create a shunt between the portal vein and hepatic vein from the jugular approach using serial dilators. These shunts showed poor patency and occlusion occurred within a short period. In 1981, Colapinto created TIPS using 12mm angioplasty balloon, again with poor patency rates. It was in 1989 after Palmaz metallic stents became available that long-term patency of TIPS became a reality. TIPS has now gained worldwide acceptance. Technical refinements have resulted in reduced morbidity and mortality. Our technique of successful creation of TIPS with step by step illustration will be demonstrated. Various methods to help cannulation and localizing of the portal vein will be shown. Alternative methods of percutaneous decompression of portal hypertension when TIPS cannot be successfully created will also be discussed. Our methods of treating complications of TIPS such as hepatic encephalopathy will also be shown.

Tuesday, October 19, 2010

11:05 **Descending Thoracic Aortic Dissection with Retro-Esophageal Right Brachiocephalic Anomalous Treated with an Endovascular Separated Aortic Stent Graft—A Case Report:**
Hananto Andriantoro, MD, FICA, Iwan Dakota, MD, FICA, Regional Secretary, Membership Committee, International College of Angiology; I. Sunu, MD, FICA, RWM Kaligis, MD, FICA, GM Harimurti, MD; Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of Indonesia, National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.

A 65 year old women presented to the hospital with a primary complaint of abdominal pain for 1 month prior to admission. She was referred from the another hospital with a suspected aortic aneurysm. There was neither a pulsatile tumor in the abdomen, nausea or vomiting. She also showed signs of heart failure. This patient had known hypertension for the past 4 years without proper medication. Physical findings revealed hypertension with a blood pressure of 170/90 mmHg, tachycardia, and rales found over both basal lungs. A widening of the aortic segment and sigs of congestion were reveal on chest x-ray. Laboratory findings showed an elevation of both fibrinogen and D dimer levels. Echocardiography revealed a decreased in ejection fraction (EF 30%) with signs of advanced hypertensive heart disease. A multislice CT angio confirmed of DeBakey's Type III aortic dissection, involving the thoracoabdominal aortic segment, along with a single functioning kidney, and a diminished left kidney. Interesingly, an anomalous origin of right brachio-cephalic artery was found coming from the left side (descending aorta) through the retro-esophageal space with the origin of the anomalous located distally to left subclavian artery. She underwent a TEVAR procedure with a Separated Stent Graft system (SEAL™) distally to the origin of anomalous of the right brachiocephalic artery to the descending aorta. The results were good and excluded the false lumen. Following the procedure, this patient's the clinical status improved markedly. The patient was discharged 4 days following the procedure. A CT angio at 3 months follow-up revealed acceptable results.

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11:15 **Ischemia of the Left Upper Extremity Following Thoracic Endovascular Aortic Repair in Patients with Anomalous Origin of the Left Vertebral Artery:** RWM Kaligis, MD, FICA, S. Adiarto, MD, Iwan Dakota, MD, FICA, Regional Secretary, Membership Committee, International College of Angiology; H. Andriantoro, MD, FICA, I. Sunu, MD, FICA, GM Harimurti, MD; Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of Indonesia National Cardiovascular Center Harapan Kita, Jakarta, Indonesia.

Thoracic endovascular repair has been the procedure of choice in treating type B aortic dissection. As the entry tear of the aortic dissection frequently is located in the proximity of left subclavian artery, the possibility of partial or complete occlusion of left subclavian artery by an aortic stent graft with the possible need of revascularization should be anticipated.

A 50 year old hypertensive patient was referred from a district hospital for further management of type B aortic dissection. CT scan revealed descending aortic dissection with multiple entry tears, including one located just 2mm distal to the left subclavian artery. Side branches originated from true lumen with the exception of the left renal artery. The four vessels were good. However, the left vertebral artery originating anomalously from the aorta just proximal to the origin of left subclavian artery. The patient was the treated with amlodipine, metoprolol, doxycycline and valsartan. Upon stabilization, TEVAR was performed with 36 x 100 mm flex stent graft. Final aortography showed a complete seal of entry tear, normalization of renal artery flow and albeit low, preservation of forward flow in the subclavian artery.

A few hours later, the patient complained of severe left arm pain. We confirmed the brachial pulse was very weak. The patient was then moved to the cath lab for urgent revascularization of the left subclavian artery. Puncture of the brachial artery was difficult but successful. A 0.035" Terumo wire was inserted through the brachial artery and was advanced to the ascending aorta. Accordingly, a chimney stent (covered stent) system was successfully applied and forward flow to subclavian artery was restored.

Comment

Ischemia of the left arm is actually very rare. However, the anomalous origin of the left vertebral artery proximal to the left subclavian artery negated the alternative flow to left subclavian artery from the circle of Willis through the left vertebral artery.

11:25 **Interventional Management of Stroke:** Horia Marin, MD, Henry Ford Health System, Detroit, Michigan.

Background and Purpose

Intra-arterial treatment for acute ischemic stroke has become a well accepted treatment option in patients presenting with severe deficits (NIHSS>10), non-responders to IV thrombolysis and patients treated beyond the 3 (4.5h) window. This educational presentation will outline clinical indications, patient selection, and interventional treatment alternatives for the acute stroke patient.

Methods

The treatment options are intra-arterial transcatheter lytic infusion, mechanical clot retrieval, thrombaspiration, less common, angioplasty, and stenting. Illustrative cases will be presented.

Results

Successful revascularization is significantly associated with good long term outcome. Depending on the site of occlusion, clot burden, anatomic considerations, the rate of revascularization is reported between 60-80%.

Conclusion

At the end of this practical approach to interventional management of stroke, the audience will be familiar with indications, technical considerations, limitations and complications of various intra-arterial treatments for the acute stroke patient.

11:35 **A Huge Abdominal Aortic Aneurysm (AAA) with a Tortuous Delivery Vessel Treated with a Separated Stent Graft System:** I. Sunu, MD, FICA, S. Adiarto, MD, Iwan Dakota, MD, FICA, Regional Secretary, Membership Committee, International College of Angiology; H. Andriantoro, MD, FICA, RWM Kaligis, MD, FICA, GM Harimurti, MD; Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of Indonesia, National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.

A 74 hypertensive male was referred from a private hospital for evaluation and treatment of AAA. This patient also has concomitant CAD 3VD. He has been complaining of shortness of breath and abdominal discomfort for 2 years. MSCT scan showed an AAA starting from 20 mm below the renal artery extending into both iliac arteries with the largest outer diameter of 86.4 mm. Chronic dissection was present but the false lumen was filled with thrombus. Although both ilio-femoral arteries were tortuous and angulated, they were considered sufficient for interventional access. EVAR was then performed with 30 x 50 mm inner bare stent and 28 x 40 mm main body. Right and left limb extensions of 12 x 20, 12 x 80 mm (right) and 12 x 80mm, 12 x 100 mm (left) were delivered smoothly through the tortuosity of the ilio-femoral arteries, and respectively deployed. Stenosis of the left iliac artery was also detected and was successfully dilated with 10x40 peripheral balloon.

Intervention of aneurysmatic aorta is indicated in the presence of pain or when the largest diameter of the aorta exceeds 50 mm. EVAR has become the treatment of choice due to its comparable effectiveness and less invasive nature of the procedure when compared to open surgery. However, EVAR was not that simple in this case considering the tortuosity of the ilio-femoral artery and severe angulation of the aorta. Nevertheless, EVAR was considered the treatment of choice because of the presence of severe concomitant CAD and the high complication rate of open surgery.

Tuesday, October 19, 2010

12:00 PM – 1:00 PM

Nineteenth Scientific Session

Can We Predict Mechanisms of Aneurysm in Humans from Animal Models?

A Special Luncheon Session

This special session is devoted to the mechanisms of aortic aneurysms in animal models, and the prediction of the mechanisms of aneurysms in humans using animal models.

Introduction By:

Thomas F. Whayne, Jr., MD, PhD, FICA

Professor of Medicine; Vice President, International College of Angiology; Co-Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Co-Chairman, Local Organizing Committee, 52nd Annual World Congress, International College of Angiology; Division of Cardiovascular Medicine, University of Kentucky College of Medicine, Lexington, Kentucky.

Presentation By:

Alan Daugherty, PhD, DSc

Committee Member, Local Organizing Committee, 52nd Annual World Congress, International College of Angiology; Senior Associate Dean for Research, UK College of Medicine; Director, Saha Cardiovascular Research Center; Gill Foundation Chair in Preventative Cardiology, Lexington, Kentucky.

Tuesday, October 19, 2010
1:00 PM – 3:00 PM
Twentieth Scientific Session

Preventative Cardiology

This session deals with measure to prevent cardiovascular diseases with emphasis on atherosclerosis, smoking, and physical inactivity.

Moderators:

RWM Kaligis, MD, FICA
Head, Vascular Division, Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of Indonesia, Jakarta, Indonesia; Member, Vascular Unit, National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.

Joseph Veselka, MD, PhD, FESC, FSCAI, FICA
Professor of Medicine; Editor, *International Journal of Angiology;* Chief, Cardiovascular Center, University Hospital Motol, Prague, Czech Republic.

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1:00 **Current Status of Atherosclerosis Prevention:** Thomas F. Whayne, Jr., MD, PhD, FICA, Professor of Medicine; Vice President, International College of Angiology; Co-Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Co-Chairman, Local Organizing Committee, 52nd Annual World Congress, International College of Angiology; Division of Cardiovascular Medicine, University of Kentucky College of Medicine, Lexington, Kentucky.

Major strides have been made in the prevention or delay of clinical events from coronary heart disease (CHD) and peripheral vascular disease (PVD). The lipid hypothesis that cholesterol reduction could benefit CHD and PVD patients was around for many years with limited proof and was finally established with reduction of cholesterol by cholestyramine in the Lipid Research Clinics Study with subsequent major confirmation when statins became available, supported by their successful outcomes studies. The major effect appears to be low density lipoproteins (LDL) reduction along with the additional pleiotropic effects that statins offer. Although regression of atherosclerosis is a reality and established, the major benefit thus far of an aggressive treatment of elevated LDL is atherosclerotic plaque stabilization. There is general agreement that the patient at high cardiovascular (CV) risk should be treated to have an LDL less than 70 mg/dl and this high CV risk includes diabetics. Good control of diabetes mellitus appears to be beneficial to the CV patient but very close control has not shown definite benefit and some possible harm as in the ACCORD Study. Regarding the LDL level, the evidence appears to support that lower is better, with supporting evidence down to an LDL level of 40 mg/dl. Much controversy has emerged on the use of ezetimibe in achieving this low LDL goal but there is no question that it contributes significant additional LDL reduction. Nevertheless, outcomes studies with ezetimibe use are still lacking. Inflammatory risk factors appear significant in contributing to CHD and PVD, especially as evaluated with high sensitivity C-Reactive Protein (hsCRP). In the JUPITER Study, it was pushed that a specific statin, rosuvastatin, has special relevance in lowering hsCRP to decrease CV events but the reality is that all statins decrease hsCRP relative to potency and the addition of ezetimibe to a statin also contributes favorably.

Right now, the major question right now is—what is the next frontier in CHD and PVD prevention? Most experts appear to agree that high density lipoproteins (HDL) represent the next focus of atherosclerosis prevention. This focus appears to involve approaches to HDL elevation but also HDL modification since there is now awareness that there are harmful HDL structures, the alteration of which can convert the lipoprotein into a particle associated with the reduction of CHD and PVD. The best currently available medication to increase HDL favorably is nicotinic acid, the tolerance to which is limited in many patients. Laropiprant is already approved in Europe, Mexico and some other countries, with approval pending in the United States. This medication markedly decreases the adverse flushing associated with nicotinic acid. Also regarding the most effective medication class known to raise HDL, the cholesterol ester transfer protein (CETP) inhibitors, the initial one, torcetrapib, turned out to have negative results. However preliminary data for two other CETP inhibitors, anacetrapib and dalcetrapib, appear beneficial so, fortunately, there does not appear to be a problem for the entire CETP class of medications.

A new statin medication, pitavastatin is now available but the only advantage will probably be that all statins have different structures and patient intolerance of one or more statins may not extend to all. LDL lowering is still the gold standard of CHD and PVD prevention but unfortunately, for the most difficult heterozygous and homozygous hypercholesterolemic patients, LDL apheresis is very expensive and inadequately covered by health insurance. Therefore, availability is very limited. Pleiotropic effects of especially statins are important in prevention but the best guideline currently available is that the lower the level of LDL achieved the better.

Tuesday, October 19, 2010

1:10 **The Effectiveness of Structured Cardiac Rehabilitation (CR) to Improve Physical Activity in the Secondary Prevention of Coronary and Peripheral Artery Disease:** Andrea Gyöngy, MSc, FICA, Institute of Cardiovascular Prevention and Rehabilitation, Locarno, Switzerland.

Objectives

Even though most patients are aware of the importance of regular physical activity in the secondary prevention of coronary and peripheral artery disease, and for their health status, only a few of them comply with the general recommendation to perform regular, moderate to high intensity, physical activity.

Methods

We studied several scientific documents concerning the significance of regular physical activity, the recommendations of the position paper of the working group on cardiovascular rehabilitation and exercise physiology of the European Society of Cardiology, and the statements of the AACVPR, ACC, and AHA, regarding the recommendations and statements for performing physical activity as direct observation. We collected data from 120 patients of our institute, including information on their general health status and their physical activity before and after the intervention. The data collection is based on a review of the patients in the last 5 years.

Results

The actual studies show that cardiovascular prevention rehabilitation programs help to improve physical activity. Physical activity assures benefit for overall behavior, for metabolic processes, for endothelial function and overall health.

Conclusions

Physical capacity is a predictor of all cause mortality for patients with cardiovascular disease and for those with intermittent claudication. The actual sedentary lifestyle of western civilizations conducts the resident population toward epidemic health problems. Vascular disease (cardiovascular, cerebrovascular, peripheral arterial), diabetes, bone narrowing are only a few consequences of an unhealthy, and sedentary lifestyle.

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1:20 **Stop Smoking—The Best Therapy against Atherosclerotic Artery Disease:** Mauro Capoferri, MD, Cardiocentro Ticino, Lugano, Switzerland.

Smoking is undoubtedly one of the most aggressive risk factors not only for the development of the atherosclerotic plaque but also for its rupture causing an acute vascular event. Therefore, every invasive or pharmacological intervention for treatment or prevention of vascular disease will be incomplete for smoking patients without an effective strategy promoting smoking cessation. This goal needs not only the hard motivation of the patients, but also a strong competence of the doctor who should appropriately advise each patient. In fact, it is wrong to simply define a patient as a smoker or a non-smoker. Smokers are not like smokers and there are several levels of psychological predisposition to stop smoking. These different motivational levels will be discussed and for each of these situations, and concrete tools for a successful "stop-smoking" intervention will be provided (what should be said, when, whom and how).

In fact, there are some typical reactions and "defensive comments" from the patient while listening to the physician advising to stop smoking. The physician should be aware of these situations and must be able to counteract. At the end of the conference the participant should be able to increase its competence and its arsenal to undermine the will to smoke. The participant will be able to conduct a motivational intervention in an intelligent and time-saving way, increasing the rate of success, and therefore, reducing the feeling of frustration in case of failure.

A brief overview of the available pharmacological support to stop smoking will also be discussed.

Tuesday, October 19, 2010

1:30 **Meet the Experts—WALKING—How I Do It:** Andrea Gyöngy, MSc, FICA; Franziska Gyöngy, MSc; Andrea Bronz; Mauro Capoferri, MD, Institute of Cardiovascular Prevention and Rehabilitation, Locarno, Switzerland.

Tuesday, October 19, 2010

2:10 **Meet the Experts—RUNNING—How I Do It:** Franziska Gyöngy, MSc; Andrea Gyöngy, MSc, FICA; Andrea Bronz; Mauro Capoferri, MD, Institute of Cardiovascular Prevention and Rehabilitation, Locarno, Switzerland.

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