International College of Angiology
51st Annual World Congress
Beijing Railway Hotel • Beijing, China
October 25-27, 2009

October 25-27, 2009
Beijing Railway Hotel • Beijing, China

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We welcome you to the 51st Annual World Congress of the International College of Angiology at Beijing Railway Hotel, Beijing, China.

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51st Annual World Congress
Beijing, China
October 25-27, 2009

Scientific Program

Sunday, October 25, 2009

08.00 h. – 08.30 h.

Beijing Railway Hotel

Opening Ceremony

Master of Ceremony and Introductions By:

Takao Ohki, MD, PhD, FICA

Professor of Surgery, Albert Einstein School of Medicine, New York, 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.

Introductions

Program Chairman

John B. Chang, MD, FICA, FACS

Professor of Clinical Surgery, Albert Einstein School of Medicine; 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.

President

Sibu P. Saha, MD, MBA, FICA

Professor of Surgery; Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

Chairman, Scientific Committee

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

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Professor of Surgery; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* Vascular Institute and Xuan Wu Hospital, Capital University of Medical Science, Beijing, China.

Jian Zhang, MD, *Chairman*

Department of Vascular Surgery, Capital Medical University, Beijing, China.

Shen-ming Wang, MD, *Co-Chairman*

Professor of Surgery, Department of Vascular Surgery, Zhongshan University First Hospital, Guangzhou, China.

Yong-guan Gu, MD, *Secretary General*

Department of Vascular Surgery, Capital Medical University, Beijing, China.

Opening Remarks & Welcome Address

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

Professor of Clinical Surgery, Albert Einstein School of Medicine; 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.

Sibu P. Saha, MD, MBA, FICA, *President*

Professor of Surgery; Member, Board of Directors, International College of Angiology; Chairman, Membership Committee, International College of Angiology; Editor, *International Journal of Angiology;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

David T. Hannan, MD, MPA

President, Medical Society of the State of New York, Albany, New York; President, Arcadia Family Practice, P.C., Marion, New York.

Sunday, October 25, 2009

08.30 h. – 12.00 h.

First Scientific Session

Live Case Presentations

from the

Institute of Vascular Surgery, Xuan Wu Hospital
Capital Medical University, Beijing

Moderators:

Takao Ohki, MD, PhD, FICA
Professor of Surgery, Albert Einstein School of Medicine, New York, 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.

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;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

12.00 h. – 13.00

Second Scientific Session

Special Luncheon Lecture

Professor John B. Chang Oration Lecture
Evolution in the Management of Budd-Chiari Syndrome

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;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

Presentation By:

Zhong Gao Wang, MD, PhD, FICA, FSVS
Professor of Surgery; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* Honorary Chairman, Local Organizing Committee, 51st Annual World Congress; Vascular Institute and Xuan Wu Hospital, Capital University of Medical Science, Beijing, China.

Objective
The objective of this study was to explore the development of therapy for a formerly rare and life-threatening disorder, Budd-Chiari Syndrome (BCS).

Methods
Beginning in 1981, 2677 patients with BCS were admitted including 2546 cases that underwent intervention. Therapeutic means included 170 membranotomies, 181 cavoatrial shunts, 312 mesoatrial shunts including meso-cavoatrial shunts, 67 meso-jugular shunts, 232 radical resections, 1289 PTAs, and 295 miscellaneous procedures.

Results
Patients treated in the first decade had an effective rate of 77.7%. Patency for various approaches was approximately 60 to 90% at seven years. In our early experience, 55.7% patients underwent shunts, 26.1% had a transcardiac membranotomy, and 0.8% was treated with interventional modalities. Recently this has shifted to 16.2%, 5.2%, and 55.6% respectively ($p<0.01$). In the early phase, 11.6% of patients were classified as stage I (least clinically severe), and 28.6% patients in stage IV (most severe). In contrast, the recent patients were 56.1% and 4.8% ($p<0.01$).

Conclusion
Chronologically, therapy has evolved from the relatively simple to the more complex (such as variety of shunts and radical correction) procedures, and finally, interventional approaches as the main modality. However, for patients with type II (long segment occlusion in the IVC), major procedures maintain an essential role, particularly with the meso-cavoatrial shunt. For those with type III (HV lesions), shunts remain the procedure of choice. This increased use of interventional methods is a reflection of a greater clinical awareness and more frequent detection of much less severe cases. In stark contrast, there is a decline in numbers of advanced cases, signaling a landmark breakthrough in the management of BCS.

Sunday, October 25, 2009

13.00 h. – 16.00

Third Scientific Session

Live Case Presentations

From the

Institute of Vascular Surgery, Xuan Wu Hospital
Capital Medical University, Beijing

Moderators:

Takao Ohki, MD, PhD, FICA
Professor of Surgery, Albert Einstein School of Medicine, New York, 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.

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;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

Monday, October 26, 2009

07.30 h. – 08.30 h.

Fourth Scientific Session

Special Breakfast Session

Professor John B. Chang Research Achievement Award
History of Vascular Surgery: Mentors Who Made a Difference

Introduction By:

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Presentation 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;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

Dr. Sibu P. Saha is the recipient of the 2009 Professor John B. Chang Research Achievement Award. Dr. Saha will give a short presentation on the History of Vascular Surgery.

Monday, October 26, 2009

08.30 h. – 10.00 h.

Fifth Scientific Session

Surgical Treatment of Arterial Aneurysms

Moderators:

Pertti Aarnio, MD, PhD, FICA

Professor of Surgery; Member, Board of Directors and Co-Chairperson, Scientific and Membership Committees, International College of Angiology; Senior Editor, *International Journal of Angiology;* Chief, Department of Surgery, Satakunta Central Hospital and University of Turku, Pori, Finland.

Zhong Gao Wang, MD, PhD, FICA, FSVS

Professor of Surgery; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* Honorary Chairman, Local Organizing Committee, 51st Annual World Congress; Vascular Institute and Xuan Wu Hospital, Capital University of Medical Science, Beijing, China.

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08.30 **Successful Surgical Repair of a Very Large Abdominal Aortic Aneurysm after Percutaneous Intervention on Three Vessel Coronary Artery Disease:** Hananto Andriantoro, MD, FICA, Berlian I. Idris, MD, Iwan Dakota, MD, FICA, Ismoyo Sunu, MD, FICA, RWM Kaligis, MD, FICA, Ganesja M. Harimurti, MD, *Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of Indonesia, National Cardiovascular Center, Harapan Kita, Jakarta, Indonesia.*

Purpose

The purpose of this study was to report on a case of successful surgical repair of a very large saccular aneurysm in the infrarenal abdominal aorta.

Materials and Methods

A 75-year old male presented with a beating abdominal mass on the lower left quadrant sized 20x15 cm. The mass was present over the past five years, and slowly increasing size, with pain penetrating to his back. Onset of paid was three months prior to admission. His risk factors were hypertension and dyslipidemia. On admission, blood pressure was 150/90 mmHg, similar in all four extremities, and heart rate was 65 bpm.

Diagnosis was confirmed with CT scan with contrast of the aorta, which revealed a saccular aneurysm of the infrarenal abdominal aorta, 8.73 cm in diameter and 13.8 cm in length. There was evidence of dissection with false lumen filled and an organized thrombus. The ascending aorta was mildly dilated. The patient also had coronary artery disease (CAD) in all three branches of the artery, revealed by coronary angiography.

Results

Prior to surgery, the patient underwent percutaneous coronary intervention (PCI) with four stents, with good results. The patient then underwent surgical repair for his aortic aneurysm with a tube Vascutek pantaloon graft number 20-10, with aortic cross clamp time 100 minutes, and blood loss 2000 cc. The patient was discharged in good condition two weeks after hospitalization.

Conclusion

A 75-year old male presented with a large abdominal aortic aneurysm. The patient underwent successful surgical repair following PCI. Percutaneous coronary intervention can be performed safely and effectively in patients with large abdominal aortic aneurysms.

08.40 **Initial Experience in the Treatment of Type B Aortic Dissection with a Separated Stent Graft System:** Iwan Dakota, MD, FICA, *Regional Secretary for Indonesia, International College of Angiology,* Hananto Adriantoro, MD, FICA, Ismoyo Sunu, MD, FICA, RWM Kaligis, MD, FICA, Ganesja Mulia Harimurti, MD, *National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.*

Background

Currently endovascular aorta repair (EVAR) to treat descending (Type B) aortic dissection is widely accepted as an alternative to open surgery. However, the current commercially available stent grafts come with relatively big delivery systems (22-24Fr), especially for the Asian population who have relatively small calibre femoral arteries, as well as for those with iliofemoral tortousity. This could lead to disadvantages or problems during stent delivery, or the entire process of stent graft deployment.

Purpose

The purpose of this study was to determine the feasibility of endovascular separated stent graft system for the treatment of acute and subacute type B aortic dissections.

Methods

In twenty-one consecutive patients with acute and subacute aortic type B dissections, covering the primary intimal tear with a separated stent graft was performed. A bilateral femoral approach was done for all patients; seven patients had left brachial access as well. The separated stent grafts come with a 12-14 Fr delivery system, consists of the main graft and the inner bare stent (Hercules/Seal™ S&G Co, Korea). These stent grafts were used in all patients. Since the separated stent graft system comes with a small delivery system, no arteriotomy was needed for all procedures. CT imaging and cine angiographic data were collected in order to determine structural and anatomic consideration. CT scan, angiography, blood test results, or non-invasive measures confirmed branch ischemia with malperfusion of at least one vessel branch of the aorta. Clinical findings and laboratory findings were collected before and after the procedures serially. Serial CT scans were collected at 1, 3, 6, 9, 12 and 24 month follow-up if possible.

Results

Out of twenty-one consecutive patients, 43% of the patients presented with acute aortic dissection, with the remaining 57% classified as subacute dissection. Indication for treatment was branch ischemia in 47% of the patients (10 pts), persistent pain in two patients, and hoarseness in one patient. The distance from the intimal tear to the left subclavian artery (proximal landing zone) was <2 cm in 6 patients (30%), and fifteen patients with a 2-6 cm intimal tear. All patients had 1-3 re-entry tears. Stent graft insertion with sealing of the primary entry tear was successful in 95.2% of the patients. There were two patients with partially covered left subclavian artery ostium by the stent graft due to a very short landing zone. In the thoracic aorta, thrombosis of the false aortic lumen occurred in all patients. In six patients the false lumen of the aorta thrombosed after 4 weeks; eight patients experienced thrombosis of false lumen in 12 weeks. In the remaining patients, complete thrombosis was seen after 1 year follow-up.

Conclusion

Endovascular treatment of acute type B aortic dissections with separated stent grafts proved to be an effective and safe procedure, as an alternative treatment to surgical repair. The advantages of the separated stent graft system are due to the relatively smaller delivery system to gain a high success rate of delivery and deployment of the stent graft. Another advantage is the fact that no arteriotomy is needed.

Monday, October 26, 2009

08.50 **Treating Abdominal Aortic Aneurysms (AAA's) with an Endovascular Separated Aorta Stent Graft: Short-Term Outcome:** Iwan Dakota, MD, FICA, Regional Secretary for Indonesia, International College of Angiology, Hananto Adriantoro, MD, FICA, Ismoyo Sunu, MD, FICA, RWM Kaligis, MD, FICA, Ganesja Mulia Harimurti, MD, *National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.*

Abdominal aortic aneurysms (AAA's) is a dangerous disease which could lead to a devastating condition if not treated properly. Endovascular procedures to treat AAA's has been widely accepted over the last decade, especially for those patients with high risk for open surgical repair. Unfortunately, the current commercially available stent graft designs come with a relatively large delivery system. This large delivery system can cause problems during delivery and deployement due to relatively small diameter of the femoral arteries of most Asian population. A smaller profile delivery system is one of the preferred options to reduce the risk of failure to deliver or even deploy stent grafts.

Purpose
The aim of this study is to determine the safety, short- and mid-term outcome of abdominal aortic aneurysm (AAA) repair with separated aortic stent grafts.

Methods
Between August 2004 and December 2008, seventeen patients with infrarenal AAA underwent treatment with separated stent grafts (Seal®, S&G Co., Korea). There were sixteen men and one woman, with a median age of 62.2 years. Anatomy of the abdominal aorta and the iliac arteries were investigated with high resolution contrast CT together with digital subtraction angiography. The majority of patients had comorbid illnesses such as hypertension (94.1%), coronary artery disease (35.3%), and diabetes mellitus (17.6%). The duration of follow-up ranged from 3 to 42 months (median 20 months).

Results
Endovascular repair was performed by transfemoral approach with 12-14 Fr sheath. Local anethesia to the bilateral groin was applied in all cases. The technical success rate was 88.2% (15pts). There was no aneurysm related mortality during the post-operative period. There was no immediate conversion to open surgical repair. The endoleak rate was 17.6% at the 1 month follow-up period. Secondary intervention was required in 5.9% of the patients (1 pt). Unilateral graft limb occlusion was found in 1 patient (5.9%).

Conclusion
Separated aorta stent grafts revealed a high degree of technical success for AAA repair in patients with comorbid conditions with a low perioperative morbidity and mortality rate in short- and mid-term results.

Monday, October 26, 2009

09.00 **Surgical Treatment of Visceral Artery Aneurysms:** Mier Jiang, MD, Xinwu Lu, MD, Ying Huang, MD, *Department of Vascular Surgery, Ninth People's Hospital, Affiliated School of Medicine, Vascular Center, Shanghai Jiao Tong University, and Institute of Traumatic Medicine, School of Medicine, Shanghai Jiao Tong University, Shanghai, China.*

Objective
The aim of this study was to analyze our experience with surgical treatment and diagnosis of visceral artery aneurysms.

Methods
From June 2003 to December 2008, eight patients (2 males, and 6 females) with nine visceral artery aneurysms (VAA's) underwent surgical treatment. Of the eight VAA's, six patients underwent open repair, and two patients were treated with an endovascular procedure. Only one small VAA's was treated with follow-up. The mean patient age was 49 years (30-72 years). The site of aneurysmal disease was the splenic artery in four cases, superior mesenteric artery in two cases, and renal artery in two cases (3 aneurysms). In one patient with a splenic artery aneurysm, portal vein hypertension coexisted.

The pre-operative diagnostic workup for all VAA's consisted of an ultrasound, computed tomography (CT) scan, and digital subtraction angiography.

Results
All eight patients with nine VAA's underwent surgical treatment for eight VAA's. Six patients were treated with open repair, and two patients were treated with an endovascular procedure. No deaths or major complications occurred in the peri-operative period. All patients remained symptom free during a mean follow-up of 26.5 months (range 2-60 months). Follow-up consisted of clinical and ultrasound scan examinations or CT scans at one and six months, and yearly thereafter.

Conclusions
VAA's are rare but important vascular lesions. Due to the risk of rupture, often with a fatal outcome, an aggressive approach to the treatment of VAA's is essential. Elective open surgical treatment and endovascular procedure of visceral artery aneurysms are safe and effective, and offer satisfactory early and long-term results. There is some evidence that small (<2 cm), and asymptomatic VAA's may be safely observed.

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09.10 **Hybrid Treatment for Thoracoabdominal Aortic Aneurysms:** Hong-peng Zhang, MD, Wei Guo, MD, Xiao-ping Liu, MD, Tai Yin, MD, Xin Jia, MD, *Department of Vascular Surgery, The Hospital of People's Liberation Army, Beijing, China.*

Objective
The aim of this study is to review our experience of hybrid conventional open and endovascular treatment of thoracoabdominal aortic aneurysms (TAAA), and evaluate the immediate and long-term outcomes.

We are unable to print the remainder of this abstract due to an unanswered discrepancy in the Methods section.

09.20 **Hybrid Laparo-Robotic Debranching and Endovascular Repair of a Thoracoabdominal Aortic Aneurysm:** Zhidong Ye, MD, Ralf Kolvenbach, MD, PhD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China; Department of Vascular and Endovascular Surgery, Düsseldorf, Germany.*

Endovascular aneurysm repair (EVAR) was introduced 17 years ago and satisfying results can be achieved for properly selected patients. EVAR has been shown to offer certain advantages over open aortic aneurysm repair. The advantages of EVAR include a shorter procedural time, less blood loss, an earlier return to normal diet, and earlier ambulation and discharge. However, because of the anatomy, not all patients are suitable for endovascular repair. Grafts with fenestrations or branches can resolve the problem of inadequate neck sizes. If the anatomy of the iliofemoral access is not suitable for EVAR, the patient can be best treated in an endovascular fashion, retroperitoneal access, even laparoscopic reconstruction with a conduit, and is sometimes a better option. Unfortunately, this procedure is not minimally invasive. The patient does not benefit from the advantage of EVAR. Hybrid total laparoscopic reconstruction with conduit and EVAR is unsuitable for iliofemoral access patients.

Patients and Materials—Surgical Technique

The procedure was performed in an operating room equipped with a mobile DSA C-arm system. The patient is placed on the operating table on a vacuum bag. When tilting the table to the right the patient can be positioned almost 70° on the right side. Previously described was the technique for total laparoscopic procedure. The left hemi colon and spleen flexure, are mobilized medially. We try to avoid any dissection of the urethra which is only placed laterally when necessary. Laparoscopic exposure of the aorta is initiated at the level of the neck of the aneurysm. The left renal vein is one of the first structures we see when dissection is started, e.g., in a patient with occlusive disease, only the site for the anatomosis proximal to the origin of the inferior mesenteric artery is dissected. This exposure technique avoids damage to the lumbar sacral nerves adjacent to the aortic bifurcation. Lumbar arteries are controlled and clipped extraluminally from the left side. After clamping the aorta, an incision was made longitudinally and a 10mm Dacron graft was anastomosed in end–to-side. The anastomosis is started on the posterior side with a 10cm 3-0 Prolene suture. A second suture is taken anteriorly, and both are tied intracorporally. A laparoscopic nerve hook is useful to put the suture line on attention. Once the laparoscopic anastomosis was complete, the other side of the 10mm Dacron graft was pulled from the abdomen, through the lowest trocar hole, thereby achieving a low angle with native aorta. The next step is to deploy the stent graft in the EVAR manner. Upon completion of EVAR, the conduit was cut and sutured near the anastomosis site.

Discussion

Endovascular aortic repair (EVAR) has progressed rapidly during the last 17 years. EVAR was developed as a less-invasive alternative to open surgery for patients with aortic aneurysms. Recent trials have reported lower operative mortality rates following EVAR than after surgical repair. However, 20% to 50% of AAA patients have anatomy unsuitable for endovascular repair. Preplanning and patient selection are essential and crucial for achieving good results of EVAR. Assessing the anatomy of an EVAR candidate include the quality of iliofemoral access, the proximal and distal attachment site, the anatomy of the aneurysm itself, etc. When assessing iliofemoral access, it is important to take into account the size of these vessels, their degree of tortuosity, their calcification, their stenotic disease, and previous stent implantation in these vessels. Tortuosity is commonly seen in aneurysmal patients. It is not a major problem because there are a variety of stiff guidewires available that can navigate tortuous anatomy. Focal calcified and stenoses are often seen in these types of patients, and experienced experts can usually overcome it. When encountering severe tortuous vessels, severe calcified vessels, severe stenotic or small vessels, or there are already stents in the common iliacs, and a combination of some of these problems, which are more common in elderly women, we must think, there may be a high degree of problems associated with access during the endovascular intervention. When there is a high degree of difficulty, or the inability to traverse with the delivery system though the iliofemoral access without risk of rupturing the iliac vessel, a life-threatening complication, the only choice is to turn to an elective procedure into an emergent one. If the anatomy of iliofemoral access is difficult or impossible, and you still think the patient can be best treated in an endovascular fashion, retroperitoneal access, laparoscopic reconstruction with a conduit is sometimes an option. These options are obviously not a less invasive method, and the patients does not benefit from the advantages of EVAR. Total laparoscopic conduit reconstruction and through the conduit to perform EVAR is an option to overcome these difficulties. Total laparoscopic aortic procedure is also less invasive. We hybrid these to make this select group of patients benefit from less invasive procedures as we can.

From our experience, we think hybrid total laparoscopic conduit reconstruction and EVAR is feasible and safe, and the patients can benefit from these two less invasive procedures.

Monday, October 26, 2009

09.30 **Surgical Treatment of Juxta-Renal Abdominal Aortic Occlusions:** Yong-quan Gu, MD, Jian Zhang, MD, Heng-xi Yu, MD, Li-xing Qi, MD, Xue-feng Li, MD, Lian-rui Guo, MD, Shi-jun Cui, MD, Ying-feng Wu, MD, Zhu Tong, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital of Capital Medical University, Beijing, China.*

Aim
The purpose of this study was to explore the methods and efficacy of surgical treatment for juxta-renal abdominal aortic occlusion.

Methods
Thirteen patients treated in recent years with juxta-renal abdominal aortic and bilateral iliac occlusion were retrospectively analyzed. Of these patients, eleven were male and two were female. The average age was 57.5 years and disease history was 8.5 months. Nine patients had foot or limb pain and hip malaise; four patients had hip fatigue; four had foot ulcers; fifty-six had skin darkness; five had sexual dysfunction; and one patient had an above knee amputated right leg. Of the twenty-five lower limbs, ankle brachial indexes (ABI) were above 0.5 in four limbs, 0.3-0.5 in eight limbs, 0.1-0.3 in six limbs, and zero in seven limbs. DSA/CTA/MRA showed occlusion of the abdominal aorta and bilateral iliac arteries in eight patients; occlusion of the abdominal aorta in five patients; and occlusion of the bilateral superficial femoral arteries in six of thirteen patients. Abdominal aortic thrombectomy and aorto-bifemoral PTFE bypass were performed on six patients. Abdominal aortic thrombectomy and aorto-bifemoral-bipopliteal PTFE bypasses were performed on six patients. Abdominal aortic thrombectomy and aorto-bifemoral PTFE bypass plus, femoral thrombectomy was performed on one patient. Abdominal aortic thrombectomy and aortofemoral PTFE bypass in the left was performed on one patient.

Results
There were no perioperative deaths. Foot or limb pain and hip malaise disappeared in eight of nine patients, and reduced in one patient. Hip fatigue was relieved in all four patients. Foot ulcers retracted in four patients. Foot skin darkness turned normal in five patients. Sexual dysfunction improved in three of five patients. ABI was >0.8 in all 25 limbs. All thirteen patients were followed-up for a mean time of 16.5 months. One patient died of a ruptured thoracic aorta aneurysm. One patient had a bilateral PTFE graft thrombosis three months after operation due to irregular anticoagulation therapy, followed with thrombectomy. All foot ulcers healed during follow-up.

Conclusions
Open surgery is effective for the treatment of juxta-renal abdominal aortic occlusion.

Monday, October 26, 2009

10.15 h. – 12.00 h.

Sixth Scientific Session

Carotid Arterial Intervention

Moderators:

Wei Guo, MD
Professor of Surgery; Department of Surgery, PLA General Hospital, Beijing, China.

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;* Department of Surgery, University of Kentucky, Lexington, Kentucky.

Shen-ming Wang, MD
Professor of Surgery, Department of Vascular Surgery, Zhongshan University First Hospital, Guangzhou, China.

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10.15 **Carotid Endarterectomy (CEA) Following an Unsuccessful Carotid Artery Stenting (CAS) in Octogenarians and Nonagenarians:** Choon S. Shin, MD, *Clinical Professor of Surgery, Weill Medical College of Cornell University, New York, New York; Director of Surgery, New York Community Hospital, Brooklyn, New York.*

Purpose
The purpose of this study was to evaluate the safety of CEA performed under general and cervical block anesthesia in octogenarians and nonagenarians following unsuccessful CAS; the length of hospital stay, and 30-day morbidity and mortality

Materials and Methods
From 2004 through 2008, CEA was performed in five patients with symptomatic carotid artery disease (3 male, 2 female with a mean age of 87 (81-93). All five patients were considered to be high risk for CEA and were scheduled for CAS. CAS was not successful due to technical difficulty (1), possible cerebral embolism (1), possible allergic reaction (1), ventricular arrhythmia (1), and severe calcification of the thoracic aorta (1). Comorbidities include hypertension, smoker, diabetes mellitus, and coronary artery disease. Cervical block anesthesia was used in four patients and a 93-year old patient underwent CEA under general anesthesia with an intraluminal shunt.

Results
All patients were discharged from the hospital within 3 to 5 days. There were no major neurological or cardiac complications. Two patients developed minor transient neurological deficits with complete recovery before discharge from the hospital.

Conclusion
CEA can be performed safely in extremely elderly patients following an unsuccessful CAS in selected cases. Since CAS is associated with increased complications in octogenarians (*J of Vascular Surgery, V.40, p.1106-1111), (Lancet 2008;7:216-222),* CEA may be preferable to CAS in this age group.

10.25 **Fate of External Carotid Artery Following Carotid Interventions:** Wei Zhou, MD[1], Maureen M. Tedesco, Fritz Bech, Weesam Alkatib, Barton Lane, [1]Associate Professor of Surgery, Division of Vascular and Endovascular Surgery, Department of Surgery, Stanford University, Stanford, California, and Chief, Vascular Surgery, Palo Alto VA Medical Center, Palo Alto, California.

Objective

The external carotid artery (ECA) is an important collateral pathway for cerebral blood flow. Carotid artery stenting (CAS) typically crosses the external carotid artery, while carotid endarterectomy (CEA) includes deliberate ECA plaque removal. The purpose of this study was to compare the long-term patency of the ECA following CAS and CEA as determined by carotid duplex ultrasound.

Materials and Methods

Duplex ultrasounds and hospital records were reviewed for consecutive patients undergoing CAS between February 2002 and April 2008, and compared with those undergoing CEA in the same time period. Pre-operative and post-operative ECA peak systolic velocities were normalized to the common carotid artery as ECA/CCA ratios. A significant (>80%) ECA stenosis was defined as an ECA/CCA ratio of 4.0. A change of ratio >1 was defined as significant. Data was analyzed using Student's T test and chi square analysis.

Results

A total of eighty-six CAS procedures in 83 patients were performed (81 males, mean age 70.3 years). Among them, 38.4% of patients had prior CEA and 9.6% with contralateral ICA occlusion. Sixty-nine CAS and 65 CEA patients with complete duplex data at the same time period were included in the analyses. There was no difference in the incidence of severe ECA stenosis on pre-operative ultrasound evaluations. During a mean follow-up of 34 months (range, 4 to 78 months), three post-procedure ECA occlusions were found in the CAS group. Likelihood of severe stenosis or occlusion following CAS was 28.3%, compared with 10% for CEA ($p < 0.025$). However, 62% of CAS patients had no significant change in ECA status. Reduction in degree of ECA stenosis was observed in 9.4% of CAS versus 26.6% of CEA patients. Overall, immediate post-operative ratios of both groups were slightly improved, but there was a trend of more disease progression in CAS group during follow-up.

Conclusion

CAS procedure is associated with a higher incidence of post-procedure ECA stenosis. Despite initial improvement, a trend toward late disease progression of ECA following CAS warrants long-term evaluation.

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10.35 **Internal Carotid Artery Stenting (CAS) or Open Repair (CEA)?** Zhidong Ye, MD, Peng Liu, MD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China.*

Stroke and cerebrovascular disease contributes to the major causes of death and disability worldwide. About 20-40% of strokes are due to the result of occlusive disease of the carotid artery. Treatment of extra-cranial carotid stenosis can prevent ischemic events caused by embolization of atherosclerotic plaque or by occlusion and severe narrowing of the carotid artery.

Eascott first described carotid endarterectomy (CEA) in 1954. Several famous clinical trials (NASCET, ACAS, ECST, et al) have approved the benefit from CEA. CEA was established as the gold standard treatment for carotid occlusive disease.

Recently, carotid angioplasty and carotid artery stenting (CAS) were clinically performed. These techniques were originally for high-risk patients undergoing CEA. Now, CAS is considered an alternative option to CEA in high risk patients.

We review some literature and clinical trials of CEA or CAS, and discuss the clinical results, and indication for CEA and CAS.

10.45 **Clinical Experience of Simultaneous Carotid Endarterectomy and Coronary Artery Bypass Grafting:** Zhidong Ye, MD, Peng Liu, MD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China.*

Objective
The objective was to assess the safety and early results of performing combined carotid endarterectomy (CEA) and coronary artery bypass grafting (CABG) in patients with coexistent cerebral and coronary vascular disease.

Methods
From January 2000 to August 2008, combined CEA and CABG were performed on twenty-five (25) patients [20 male, 5 female, range in age of 63-85 years old (average 70.9±6.8)]. Angiography was performed for definite diagnosis. Coronary angiography showed left main trunk disease in six (6) cases; double vessels disease in four (4) cases; triple vessels disease in fifteen (15) cases; unilateral carotid stenosis >70% with contralateral occlusion in four (4) cases; unilateral carotid stenosis >90% in five (5) cases; unilateral carotid stenosis >70% with contralateral carotid stenosis <50% in fifteen (15 cases); and unilateral carotid stenosis 50-60% with ulcer plaque in one (1) case. Both procedures were performed under one anaesthesia: the CEA was performed first. Following completion of the CEA, CABG was performed with cardiopulmonary bypass (CPB) in five (5) cases; off-pump CPB in twenty (20) cases, and carotid artery shunt and patch was used for all cases during CEA.

Results
There were no operative mortalities, no peri-operative cardio-cerebral vascular accidents, and a right femoro-popliteal artificial bypass graft was performed in one (1) case 1 month after the procedure. The average follow-up period was 24.6±3.5 months. No angina pectoris, cerebral stroke, or transient ischemic attacks occurred during the follow-up period.

Conclusions
The use of combined procedures for patients with concomitant carotid and coronary artery disease was acceptable with satisfactory early results.

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10.55 **Carotid Subclavian Bypass Grafting for Symptomatic Subclavian Artery Occlusion:** Lian-rui Gu, MD, *Department of Vascular Surgery, Xuan Wu Hospital, Capital University of Medical Sciences, Beijing, China.*

Objective
We analyzed the operative effect of carotid subclavian bypass grafting for subclavian artery occlusion.

Methods
Seventeen patients with subclavian artery disease were diagnosed by arteriography, and received carotid subclavian bypass grafting. Graft patency was determined by Duplex ultrasound scan examinations.

Results
All seventeen (17) patients undergoing bypass grafting achieved immediate relief of symptoms. The blood pressure differences between the treated and the healthy arms were less than 10 mmHg. The ratio of healthy vs. diseased side of the mean blood pressure index increased from 0.64±0.12 pre-operatively to 0.98±0.10 post-operatively ($p<0.01$). No peri-operative stroke or death occurred. By 7.1 years of the mean follow-up, the patency rates at 1 and 5 years were 100% and 94.1% respectively.

Conclusion
Carotid subclavian bypass grafting for subclavian artery disease has shown to be very safe and effective, with excellent long-term patency. We believe it should be offered to low risk surgical candidates who may be seeking a more durable procedure.

Monday, October 26, 2009

11.05 **Treatment of Carotid Artery Aneurysms with Endovascular Stent Graft Exclusions: A Report of 4 Cases:** Xiaoxi Li, MD, Songqi Li, MD, Guanqi Chang, MD, Caisheng Ye, MD, Wenquan Zhuang, MD, Wei Chen, MD, Shengming Wang, MD, *Department of Surgery, The First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China.*

Purpose
The purpose of this study was to present the results of endovascular treatment for carotid artery aneurysms.

Materials and Methods
A retrospective chart review was performed on four (4) patients who underwent endovascular interventions, and twenty-six (26) consecutive patients who presented with extracranial carotid artery aneurysm (ECCA), and admitted between January 2002 and July 2009.

Results
There were three (3) men and one (1) woman with ECCA, three of which had false aneurysms associated with trauma located on common carotid artery, and one true aneurysm located on the extracranial internal carotid artery (ICA). Under local anaesthesia, a long sheath was advanced from a transfemoral access to the carotid artery. Heparin (5000 units) was given intravenously. Then the ICA aneurysms were carefully passed with a wire and catheter. A heavy guidewire was then placed, under fluoroscopic control. A Fluency expandable stent graft (Bard, USA) was placed to cover the aneurysm. A 10×80-mm Fluency stent graft was used for three (3) cases with the common carotid artery aneurysms, and 10×60-mm Fluency stent graft for one (1) extracranial internal carotid artery aneurysm. Radiographic and clinical follow-up periods ranging from 2 months to 3 years revealed early aneurysm exclusion with excellent results and a follow-up patency of 100%, and no stent-related mortalities.

Conclusion
Endovascular treatment of ECAA offers a valuable alternative to surgery. Preliminary results suggest that placement of stent grafts are a safe and effective method. Data relating to late follow-up is still very limited. The more widespread the use of this approach, long-term evaluations in large groups of patients will be required.

Monday, October 26, 2009

12.00 h – 13.00 h.

Seventh Scientific Session

Professor Albert Senn Memorial Luncheon Lecture
Technical Merits in Complex Vascular Reconstruction

Introduction By:

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Presentation By:

John B. Chang, MD, FICA, FACS

Professor of Clinical Surgery, Albert Einstein School of Medicine; 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.

Purpose

The purpose of this study was to review long-term values and current surgical and endovascular management strategies on my personal experiences with of over 6,700 cases.

Materials and Methods

A clinical review was performed for the results of 6,700 cases with long-term follow-up to evaluate the value and long-term outcome of multiple and different complex open and endovascular procedures.

Results

We describe the long-term validity of open procedures including long-term outcome of carotid surgery, aortic reconstructive procedures, distal bypass, and reconstructive procedures.

Conclusions

Long-term follow-up and management is a mandatory commitment to our patients. Indication for surgery and/or intervention needs to be individualized depending on patient's age, life expectancy, and co-morbidity. Endovascular procedures are here to stay. However, further improvement in the technology is required. Newer drugs and medical management will modify the natural history of vascular disease. Bioengineering, biochemical, and gene therapy will define the future management of vascular disease. Vascular surgeons will continue to meet challenging, complex surgical problems during the foreseeable future. Revascularization and reconstruction will remain as the fundamental principles for vascular surgeons.

Monday, October 26, 2009

13.00 h. – 14.00 h.

Eighth Scientific Session

Diagnostic & Interventional Procedures for Peripheral Arterial Disease
Scientific Poster Presentations

Moderator:

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

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13.00 **Predictors of Distal Embolization in Peripheral Percutaneous Interventions (PPI): Data from a Real World Registry:** Nicolas W. Shammas, MD, MS, FICA, *Editor, International Journal of Angiology;* Gail A. Shammas, BS, RN, Eric J. Dippel, MD, Waheeb J. Shammas, Michael Jerin, PhD, *Midwest Cardiovascular Research Foundation, Davenport, Iowa.*

Background

Distal embolization (DE) commonly occurs during peripheral percutaneous interventions (PPI) of the lower extremity arterial vessels. Predictors of DE remain unclear. Small studies suggest that long calcified lesions, recent thrombotic occlusions, atherectomy, and mechanical thrombectomy can lead to clinically significant DE. In this study we evaluate the predictors of DE in a large cohort of patients undergoing PPI in our center.

Methods

Patients who experienced clinically significant DE (requiring further mechanical or pharmacologic therapy as per operator judgment) were extracted from a peripheral vascular registry (n=14/576, 2.4%) that prospectively tracks demographics, clinical, procedural and outcome variables on patients undergoing PPI in two (2) medical centers and compared to patients in the same registry that did not experience DE (n=562). Univariate analysis was utilized to compare patients with and without DE. Logistic regression analysis was used to determine the independent predictors of DE.

Results

By Univariate analysis, patients who experienced DE had a longer lesion length (223.57 $\pm$ 122.20 mm vs. 101.67 $\pm$ 113.87 mm, p=0.001), more severe pre-treatment lesion stenosis (96.79% $\pm$ 8.23% vs. 85.97% $\pm$ 14.20%, p= 0.001), reduced pretreatment TIMI flow (0.79 $\pm$ 1.25 vs. 2.16 $\pm$ 1.18, p=0.001), a higher rate of prior amputations (21.4% vs. 5.9%, p=0.052), a higher prevalence of TASC D lesions (71.7% vs. 28.2%, p=0.001) and angiographic thrombus (42.9% vs. 6.8%, p=0.001), and less frequency of chronic onset of symptoms on presentation (64.3% vs. 90.6%, p=0.009). Logistic regression analysis showed that prior history of amputation (OR 3.56, 95% CI 0.87-14.47, p=0.08), presence of thrombus (OR 5.02, 95% CI 1.53-16.4, p=0.008) and TASC D lesions (OR 4.31, 95% CI 1.24-15.03, p=0.022) were independent predictors of DE.

Conclusion

Clinically significant DE requiring further mechanical or pharmacologic therapy occurs in approximately 2.4% of patients undergoing PPI. Patients with TASC D lesions, angiographic thrombus, and prior history of amputation are at high risk of DE.

13.05 **Predictors of Bail-Out Stenting in Patients Undergoing Lower Extremity Interventions: Results from the SMARTHAWK Randomized Trial:** Nicolas W. Shammas, MD, MS, FICA, *Editor, International Journal of Angiology;* Gail Shammas, BS, RN, Denise Coiner, MS, RTR, Michael Jerin, PhD, Lori Christensen, RN, Eric Dippel, MD, *Midwest Cardiovascular Research Foundation, Davenport, Iowa.*

Background

There is no data on the predictors of bailout stenting in patients undergoing lower extremity arterial interventions. We present an analysis from prospectively collected data from the SMARTHAWK randomized trial on the predictors of bailout stenting during angioplasty (PTA) or SilverHawk atherectomy (SA) of infrainguinal vessels.

Methods

In the SMARTHAWK randomized trial we tested the hypothesis that SA with adjunctive PTA of infrainguinal denovo arterial lesions leads to significantly less bailout stenting rate than PTA alone. Patients were divided into two (2) groups based on actual treatment; bail out stenting versus no bailout stent. Univariate analysis was conducted between these two (2) groups. Logistic regression analysis was performed to model for the predictors of bailout stent. Variables included were diabetes, presence of moderate calcification (versus none to little), age, gender, hypercholesterolemia, TASC D lesion (vs TASC A to C) and treatment method (PTA vs SA). Below the findings are tabulated:

Predictors of bail out stenting by logistic regression analysis

			95% Confidence Interval	
	Significance	Odds	Lower	Upper
Atherectomy versus PTA	0.04	0.189	0.038	0.928
Calcium (moderate versus none-little)	0.029	6.562	1.211	35.561
TASC ABC lesion (versus TASC D)	0.037	0.104	0.012	0.872
Control Variables				
Gender	0.261	2.359	0.528	10.533
Age	0.437	1.024	0.964	1.088
Hypercholesterolemia	0.882	0.888	0.185	4.265
Diabetes	0.072	0.255	0.057	1.131

Conclusion

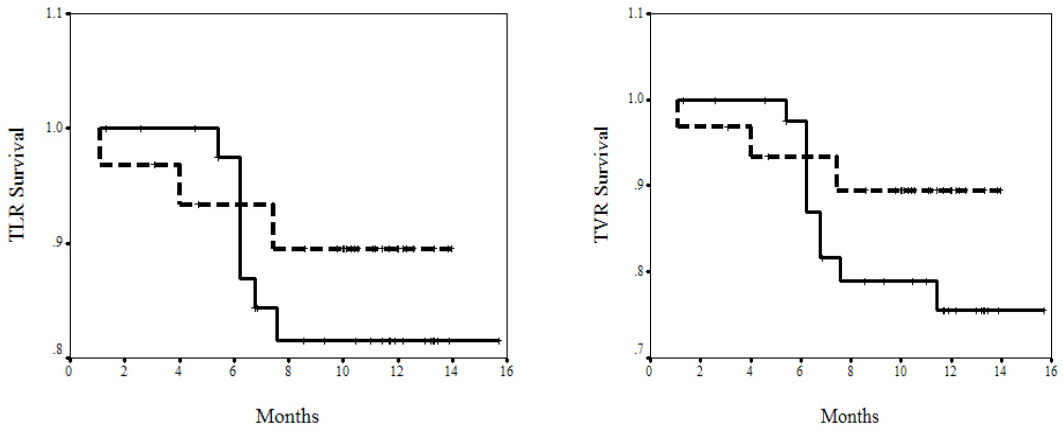
Bailout stenting in infrainguinal interventions is predicted by the use of PTA, presence of moderate calcification, and TASC D lesions after controlling for gender, age, hypercholesterolemia, and diabetes.

13.10 **Target Lesion (TLR) and Target Vessel Revascularization (TVR) in Patients Undergoing Angioplasty versus Atherectomy: Results of the SMARTHAWK Trial:**
Nicolas W. Shammas, MD, MS, FICA, *Editor, International Journal of Angiology;* Denise Coiner, MS, RTR, Gail Shammas, BS, RN, Michael Jerin, PhD, Eric Dippel, MD, Lori Christensen, RN, *Midwest Cardiovascular Research Foundation, Davenport, Iowa.*

Background
The SMARTHAWK trial is a 2-center, randomized trial that tested the hypothesis that SilverHawk atherectomy (SA) with adjunctive angioplasty of infrainguinal denovo arterial lesions leads to a significantly less bailout stenting rate than angioplasty (PTA) alone. Secondary endpoints included TLR and TVR, and the endpoints of death and amputation. We present the results of these secondary endpoints

Methods
Patients enrolled in the trial were followed at 1 month, 6 months, and 1 year post-randomization. TLR and TVR were symptom-driven. Baseline demographics, clinical and angiographic variable pre-treatments were compared between the two (2) arms. Amputation, death, TLR and TVR, were all recorded. Intention-to-treat analysis was conducted. In addition, TLR and TVR were recorded in the actual treatment arms (bailout stenting versus non stent group). Kaplan-Meier (KM) curves for TLR and TVR were also plotted.

Results
Pre-treatment demographic, clinical, and angiographic variables were well balanced between the two (2) groups. Balloon pressures were higher in the PTA group versus the SA group (10.54 $\pm$ 2.13 mmHg vs. 7.89 $\pm$ 1.72 mmHg, p=0.001) and bailout stenting occurred more often in the PTA group (50% vs 22%, p=0.013). TLR and TVR trended more in the PTA arm compared to the SA arm but did not reach statistical significance (14.6% vs 8.3% and 18.8 vs 8.3% respectively). In addition, TLR and TVR were similar in the bailout stent group compared to the non-stent group (15.6% vs 9.6% and 15.6% vs 13.5% respectively). Amputation and total mortality was also similar in both groups. Intention to treat KM curves for both TLR and TVR are presented below for SA (interrupted line) and PTA (solid line):



Conclusion
TLR and TVR trended favorably for SA compared to PTA at 1 year follow-up, but this did not reach statistical significance. It should be noted that these were secondary endpoints in the trial, therefore a type II error cannot be ruled out.

13.15 **Inflammatory and Hematologic Markers in Patients Undergoing Peripheral Angioplasty versus Silverhawk Atherectomy: Results from the SMARTHAWK Randomized Data:** Nicolas W. Shammas, MD, MS, FICA, *Editor, International Journal of Angiology;* Gail Shammas, BS, RN, Denise Coiner, MS, RTR, Lori Christensen, RN, Eric Dippel, MD, Michael Jerin, PhD, *Midwest Cardiovascular Research Foundation, Davenport, Iowa.*

Background

There is no randomized data on the inflammatory and hematologic responses in patients undergoing lower extremity percutaneous arterial interventions using balloon angioplasty (PTA) versus SilverHawk atherectomy (SA). We present this data from prespecified endpoints defined in the SMARTHAWK randomized trial.

Methods

Patients enrolled in the SMARTHAWK trial were randomized to PTA (n=29) versus SA with adjunctive balloon angioplasty (n=29). Hs-C reactive protein (hs-CRP), leukocyte and platelet counts were obtained at baseline within 1 week pre-randomization. Hs-CRP was repeated at 48-72 hours and leukocyte and platelet counts were repeated at 18-24 hours post-procedure. Analysis was done on an intention-to-treat basis.

Results

Baseline demographics, clinical and procedural variables were similar between the two (2) groups with the exception of balloon pressure which were higher in the PTA group versus the SA group (10.54 $\pm$ 2.13 mmHg vs. 7.89 $\pm$ 1.72 mmHg, p=0.001), and bailout stenting occurred more often in the PTA group (50% vs 22%, p=0.013). Baseline hs-CRP was similar in both groups (10.39 $\pm$ 19.16 vs 8.04 $\pm$ 10.34, p=ns). In addition, baseline leukocyte and platelet counts were similar in both arms. Hs-CRP increased similarly in both arms (29.28 $\pm$ 26.13 vs. 29.65 $\pm$ 26.28, p=ns). Leukocyte (8.78 $\pm$ 3.12 vs 8.58 $\pm$ 2.6, p=ns) and platelet (221.79 $\pm$ 64.68 vs. 230.00 $\pm$ 61.65, p=ns) counts were similar post-treatment. Both arms however, displayed a significant increase in hs-CRP at 48 hours compared to baseline (for PTA 29.27 $\pm$ 26.13 vs 12.6 $\pm$ 21.58, p=0.002; for SA 28.31 $\pm$ 28 vs. 9.72 $\pm$ 11.36, p=0.007 respectively). Leukocyte counts were similar at 18-24 hours in both groups when compared to baseline, but a significant drop in platelets was noted (for PTA 252.24 $\pm$ 68.6 vs 221.79 $\pm$ 64.68, p=0.001; for SA 265.43 + 84.28 vs. 230.0 + 61.65, p=0.001). A trend toward a higher hs-CRP was seen in patients with bailout stenting vs the non stenting group (37.02 $\pm$ 29.12 vs. 24.81 $\pm$ 23.05, p=ns) that did not reach statistical significance.

Conclusion

A significant but similar increase in inflammatory response at 48-72 hours was seen in patients undergoing both PTA and SA. In addition, a significant but a similar decrease in platelet count response at 18-24 hours was seen in both arms but with no change in leukocyte count. The clinical significance of these findings is unclear.

13.20 **In-Hospital Safety and Effectiveness of Bivalirudin in Peripheral Percutaneous Interventions (PPI): Data from a Real World Registry:** Nicolas W. Shammas, MD, MS, FICA, *Editor, International Journal of Angiology;* Gail A. Shammas, BS, RN, Eric J. Dippel, MD, Andrew N. Shammas, Michael Jerin, PhD, *Midwest Cardiovascular Research Foundation, Davenport, Iowa.*

Background

Bivalirudin is a direct thrombin inhibitor with predictable anticoagulation, does not activate platelets, and inhibits both soluble and bound thrombin. Bivalirudin was shown to be safe and effective in low risk PPI. Furthermore, small observational studies have also suggested that bivalirudin may be a safe anticoagulant in high risk PPI. In this study, we present real world consecutive data to evaluate the safety and effectiveness of bivalirudin in an unselected group of patients undergoing PPI.

Methods

Three hundred ninety-eight (398) consecutive patients underwent PPI over a 2-year period (November 2004 to November 2006) at our institution. Of those consecutive patients, three hundred sixty-nine (369) (92.7%) received bivalirudin and twenty-five (25) (6.3%) received unfractionated heparin (UFH)/enoxaparin. Data was extracted from a prospectively collected peripheral vascular registry developed for quality assurance measures. The Institutional Review Board at our center approved the study. Intra-procedural bivalirudin was administered as a bolus (0.75 mg/kg) and infusion (1.75 mg/kg/hr) during the procedure; the infusion was reduced by 60% in patients with creatinine clearance <30 cc/min. Demographics, clinical, procedural and angiographic variables and, in-hospital complications were analyzed. All in-hospital adverse events were independently adjudicated.

Results

Three hundred sixty-nine (369) consecutive patients receiving bivalirudin were included. The mean age was 69.36 $\pm$ 11.34 and 49.3% were males. Patients had the following: hypertension (89.7%), diabetes (43.6%), dyslipidemia (83.5%), current and past smoking history (63%), renal insufficiency (24.9%), coronary artery disease (60.6%), and history of amputation 7.5%.

Of those, 28% of patients had limb ischemia. TASC D lesion was present in 28%, and angiographic thrombus in 8.2% of patients. The procedure was successful (<30% residual narrowing) in 97.3% of patients. Adverse events included; stroke 0.3%, acute renal failure 0.3%, major bleeding 0.5%, distal embolization 3%, vascular access complications 0.5%, and minor amputation 0.5%.

Conclusion

In this study, bivalirudin had an excellent safety profile in a real life cohort of patients undergoing PPI including high risk patients with limb ischemia and TASC D lesions. Major bleeding in hospital was remarkably low, and would appear to be lower than historic controls with UFH. A randomized trial of bivalirudin versus UFH with built-in cost-effectiveness analysis is needed to verify these results and establish bivalirudin as a standard anticoagulant in PPI.

13.25 **Retrograde Stenting Technique for the Rescue of an Accidentally Occluded Visceral Artery during Fenestrated Stent Grafting:** Yuji Kanaoka, MD, FICA, Masayuki Hara, MD, Kenjiro Kaneko, MD, Koji Maeda, MD, Hiroki, Ohta, MD, FICA, Makoto Sumi, MD, FICA, Katsunori Tanaka, MD, Koji Kurosawa, MD, FICA, Shigeki Hirayama, MD, Hiromasa Tachihara, MD, Naoki Toya, MD, FICA, Atsushi Ishida, MD, FICA, Takao Ohki, MD, PhD, FICA, *Department of Surgery, Division of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.*

Purpose

Fenestrated endografts expand the application of endovascular aneurysm repair (EVAR) to a wider range of patients. However, these new devices present new complications. Loss of visceral artery patency is one of the most important complications. We describe a novel technique to rescue an indispensable visceral artery during fenestrated endografting.

Case presentation

The patient was an 88-year-old man who had a large pararenal abdominal aortic aneurysm (AAA) greater than 7cm. The patient had a history of thoracoplasty due to tuberculosis, and suffered from dyspnea, despite the use of home oxygen therapy. Therefore, he was not a candidate for conventional open repair. A custom made endograft with a scallop for the superior mesenteric artery (SMA) and fenestrations for bilateral renal arteries (RA's) was procured based on the pre-operative CT scans. The procedure was performed in an operating room equipped with a fixed Flat Panel Detector C-arm system. The precise locations of the SMA and the RA's were determined intra-operatively using angiography. Prior to completely deploying the endograft, both RA's were cannulated with a sheath in order to ascertain that the fenestrations aligned with the orifice of the RA's. However, since the scallop for the SMA was large, cannulation of the SMA appeared to be unnecessary. Following complete deployment of the endograft, the patient complained of abdominal discomfort and nausea. Angiography revealed patency of the RA's but absence of the SMA due to a malpositioning of the scallop. Attempts at recanalizing the SMA from within the endograft failed. Due to the limited warm ischemic time of the intestine, a decision was made to recanalize the SMA in a retrograde manner. After the patient was intubated, a midline laparotomy was done. The intestine was pale, consistent with SMA occlusion. In order to perform retrograde stenting of the SMA orifice, the ilio-colic artery was exposed and a 6-F sheath was inserted toward the aorta. In contrary to attempts at recanalizing the SMA in a prograde manner, recanalization of the SMA in a retrograde fashion was achieved without difficulty. In order to maintain patency of the SMA, a balloon expandable stent was inserted and deployed at the orifice of the SMA. Aortogram confirmed the patency of bilateral RA's and the SMA, as well as complete exclusion of the aneurysm. The patient was discharged from hospital without any complications.

Conclusion

Despite efforts at accurately evaluating and designing the locations of the fenestration and the scallop, misalignment and loss of visceral artery patency could occur. In such circumstances, this retrograde stenting technique appears to be an effective bailout technique. This technique may also be useful for TEVAR for aortic arch aneurysms.

13.30 **Clinical Application of an Infusion Catheter Directed Thrombolysis for Acute Limb Ischemia:** Xiao-ping Liu, MD, Wei Guo, MD, Tai Yin, MD, Xin Jia, MD, *Department of Vascular Surgery, General Hospital of PLA, Beijing, China.*

Objective
The objective of this study was to determine the feasibility and clinical outcome of the infusion catheter-directed thrombolysis for acute lower extremity ischemia.

Methods
From August 2004 to April 2006, eight (8) patients (mean age of 54 years), suffering with acute lower extremity ischemia, were treated with the urokinase infusion catheter-directed thrombolysis. We analyzed the results retrospectively. The infusion catheter-directed thrombolysis included accelerated thrombolysis with 250,000 to 500,000 U of urokinase, followed by an infusion thrombolysis with 500,000 to 1 million U of urokinase, adjunct angioplasty, or stents.

Results
Initial success was 88% (7/8) in the eight (8) patients. One (1) distal artery thrombus during the infusion thrombolysis necessitated below-knee operative thromboembolectomy. Eight (8) limbs were saved. The follow-up period ranged from 4 to 20 months, and cumulative patency was 75% (6/8).

Conclusion
In patients with severe acute ischemia, transcatheter revascularization is a viable treatment option when strategies for reperfusion establish both inflow and microcirculatory outflow.

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13.35 **Treatment of Varicose Veins of the Lower Limbs by Limited Invaginated Vein Stripping and Ambulatory Phlebectomy—A Report of 500 Cases:** Xiao-ping Liu, MD, Wei Guo, MD, Xin Jia, MD, Tai Yin, MD, Hongpeng Zhang, MD, *Department of Vascular Surgery, PLA General Hospital, Beijing, China.*

Objective
The objective of this study was to evaluate the limited invaginated vein striping and ambulatory phlebectomy in the treatment of varicose veins.

Methods
From August 2004 to February 2008, five hundred (500) patients with varicose veins received limited invaginated vein striping and ambulatory phlebectomy.

Results
Satisfied surgical results were obtained in all cases, and reflux disappeared. The operative time ranged from 20 to 42 minutes, with an average 32 minutes. The average hospitalization after operation was 3 days. Saphenous nerve damage after operation was observed in 14 (2.6%). After follow-up from 1 to 36 months, there were no remaining varicose veins, no serious complications, and a satisfied cosmetic effect was achieved.

Conclusion
Treatment of varicose veins of the lower limbs by limited invaginated vein striping and ambulatory phlebectomy is minimally invasive, has a fast recovery, and good curative effects.

Monday, October 26, 2009

14.00 h. – 15.15 h.

Ninth Scientific Session

Basic Research

Scientific Poster Presentations

Moderator:

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

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14.00 **Soluble Receptor for Advance Glycation End Products (sRAGE), a Modulator of High Sensitivity C-Reactive Protein (hsCRP):** Mabood Qureshi, MSc, AFICA, FCACB, Erick D. McNair, MSc, AFICA, Calvin R. Wells, MD, FRCPC, Rashpal S. Basran, MD, FRCPC, FACC, Colin Pearce, MD, FRCPC, FACC, Jacobus S. DeVilliers, MD, FRCPC, Jason Orvald, MD, FRCPC, Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS, *Departments of Pathology, Physiology and Cardiology, College of Medicine, University of Saskatchewan and Royal University Hospital, Saskatoon, Saskatchewan, Canada.*

Purpose

The interaction of advanced glycation end products (AGEs) with the receptors for AGEs (RAGE) increases the expression of tumor necrosis factor-alpha (TNF-α), interleukin-1 (IL-1), and IL-6. sRAGE acts as a decoy by competing with RAGE for binding with AGEs. Low levels of serum sRAGE would increase the interaction of AGEs with RAGE, resulting in increased production of IL-1, IL-6, and TNF-α. IL-1, IL-6, and TNF regulate hsCRP synthesis-α. It is also known that inflammatory mediators are elevated in acute coronary syndrome. Based on the above data, it is hypothesized that low levels of sRAGE would be associated with increased levels of hsCRP. The main objectives were to investigate, I) if low levels of serum sRAGE are associated with high serum levels of TNF-α and hsCRP; and II) if levels of serum sRAGE are lower and those of serum TNF-α and hsCRP are higher in non-ST-segment elevation myocardial infarction (NSTEMI) patients as compared to healthy subjects.

Materials and Methods

Blood samples were collected from forty-six (46) patients with NSTEMI, and twenty-eight (28) age-matched healthy subjects. Serum levels of sRAGE and TNF-α were measured using commercially available ELISA kits. Serum levels of hsCRP were measured by the high-sensitivity method using particle-enhanced immunonephelometry.

Results

The serum levels of sRAGE, TNF-α and hsCRP in control subjects were 1287.0 ± 41.5 pg/ml, 10.3 ± 0.8 pg/ml and 3.1 ± 0.26 mg/L, respectively. The levels of sRAGE, TNF-α and hsCRP in NSTEMI patients were 884.55 ± 50.0 pg/ml, 23.1 ± 2.3 pg/ml and 10.23 ± 2.2 mg/ml, respectively.

Conclusion

The data suggest that I) sRAGE is negatively correlated with hsCRP and TNF-α, suggesting that sRAGE modulates hsCRP; and II) serum levels of sRAGE are lower, while those of TNF-α and hsCRP are higher in NSTEMI patients as compared to healthy control subjects.

Monday, October 26, 2009

14.05 **Granulocyte Colony Stimulating Factors Can Increase the Harvest of Bone Marrow Derived Mononuclear Cells in Ischemic Limb Patients:** Lian-rui Guo, MD, Yong-quan Gu, MD, Jian Zhan, MD, Li-xing Qi, MD, Shu-wen Zhang, MD, Jian-xin Li, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, H. Yu, MD, D. Eton, MD, *Department of Vascular Surgery, Xuan Wu Hospital, Institute of Vascular Surgery, Capital Medical University, Beijing, China.*

Background
The purpose was to study bone marrow-derived mononuclear cells (BM-MNC) in critical limb ischemic patients.

Objective
The objective of this study was to ascertain if recombinant human granulocyte colony-stimulating factor (G-CSF) could increase the harvest of BM-MNC in critical limb ischemic patients.

Methods
We enrolled one hundred thirty-eight (138) patients with one hundred fifty-four (154) ischemic limbs (aged 70 ± 5 years, 64% male) in our study. Associated diseases included diabetes (86%), and thromboangiitis obliterans (7%). Group 1 patients (N=35, 43 limbs) were pre-treated with G-CSF 300μg/day for 2 days. Group 2 patients were not pre-treated (N=103, 111 limbs). Both groups had similar demographics. Presenting limb symptoms were gangrene (Group 1 N=7 limbs, Group 2 N=28), ischemic ulcer (Group1 N=12, Group 2 N=27), ischemic rest pain (Group 1 N=19, Group 2 N=43), and claudication (Group 1 N=5, Group 2 N=13). MNC were isolated by gradient density centrifugation from bone marrow aspirated from the iliac crest (196 ± 17ml in Group 1, 377 ± 39 ml in Group 2).

Results
The number of harvested BM-MNCs is 5.6±2.1 $\times 10^9$ (range: 1-9 $\times 10^9$) in Group 1, and 1.0±0.9 $\times 10^9$ (range: 0.6-6.7 $\times 10^9$) in Group 2. G-CSF boosted the MNC yield. There was a 10.8 fold increase in MNC when corrected for each ml of BM harvested ($P<0.001$).

Conclusion
G-CSF pre-treatment can greatly increase the harvest of BM-MNC in ischemic limb patients.

14.10 **Experimental Study on heNOS Gene Transferring Canine Endothelial Progenitor Cells:** Lian-rui Gu, MD, Yong-quan Gu, MD, Li-po Song, MD, Guo-dong Wang, MD, Chuan-jun Liao, MD, Shu-wen Zhang, MD, Jian Zhang, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital, Institute of Vascular Surgery, Capital Medical University, Beijing, China.*

Supported by the National Natural Science Foundation of China（No.30471708）

Objective

Our objective was to observe the expression of heNOS gene and biological behavior of EPCs transfected by heNOS gene.

Methods

Canine endothelial progenitor cells (EPCs) were cultured and expanded with bone marrow-derived mononuclear cells using an ex-vivo expansion method. The Ad5-heNOS recombinant adenovirus, or pEGFP-N1-heNOS recombinant plasmid were then transfected. EPCs were not transfected as a control. The expression of heNOS in EPCs was evaluated by enzyme linked immunosorbent assay (ELISA) in 48 hours after transfection. The amount of the nitric oxide (NO) in the supernatant of culture fluid was detected by nitrate reductase assay. The biological function of Ad5-heNOS transfected EPCs were detected with MTT assay, adhesion assay, migration assay, and senescence-associated-β-galactosidase staining assay.

Results

The expression of heNOS protein in Ad5-heNOS transfected EPCs (2091.67 ±172.489pg/ml) was significantly higher than that in the pEGFP-N1-heNOS transfected EPCs (173.67 ±36.757pg/ml), and the control group (158.00 ±30.914pg/ml) ($p<0.01$). The amount of NO in the supernatant of the Ad5-heNOS group was significantly higher than that in the pEGFP-N1-heNOS group and the control group. In-vitro the Ad5-heNOS transfected EPCs, demonstrated better proliferation (0.52±0.03 vs 0.31±0.02; $P<0.01$), adhesion (28.00±1.41 vs 11.83±1.45; $P<0.01$), migration abilities (109.67±6.95 vs 72.67±6.29; $P<0.01$), and lower senescence percentage (0.22±0.02 vs 0.32±0.01$P<0.01$), than EPCs not transfected.

Conclusions

The heNOS gene can be successfully transfected and effectively expressed by canine EPCs. The Ad5-heNOS transfected EPCs have enhanced neovascularization ability.

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14.15 **Experimental Study of Laparoscopic Porcine Aortic Reconstruction:** Lixing Qi, MD, Yong-quan Gu, MD, Jian Zhang, MD, Lian-rui Guo, MD, Shijun Cui, MD, Ying-feng Wu, MD, Zhu Tong, MD, Xin Wu, MD, Jianming Go, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital, Institute of Vascular Surgery, Capital Medical University, Beijing, China.*

Purpose

The purpose of this study was to explore the feasibility of laparoscopic abdominal aorta reconstruction.

Methods

Fifteen (15) pigs were placed under general anesthesia. Pneumoperitoneum was established with CO_2, and 7 trocars were used in the abdominal wall to facilitate laparoscopic manipulation. The descending colon and its mesocolon were freed. The abdominal aorta was then freed and clamped. Anastomosis of an artificial vascular graft to the abdominal aorta was completed, and evaluated by its patency and degree of bleeding.

Results

Laparoscopic aortic reconstruction was successful in six (6) pigs, and partially successful in five (5) pigs, with no vascular anastomosis. Four (4) pigs died of intra-operative bleeding. The length of operation was shortened with the increase in the number of animal experiments.

Conclusions

Laparoscopic aortic reconstruction is feasible in animals. The basic laparoscopic skills and elaborate manipulations are crucial to the success of the operation.

14.20 **The Comparison of Revascularization after the Transplantation of Marrow Mononuclear Cells and Endothelial Progenitor Cells:** Zhu Tong, MD, Yong-quan Gu, MD, Jian-xin Li, MD, Jian Zhang, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital, Institute of Vascular Surgery, Capital Medical University, Beijing, China.*

Supported by the National High Technology Research and Development Program of China (2006AA02A134), and Natural Science Foundation of Beijing (7072031)

Objective
Our objective was to compare the revascularization after transplantation of bone marrow mononuclear cells (BM/MNCs) and endothelial progenitor cells (EPCs), and investigate the roles of non-endothelial progenitor cells in angiogenesis.

Methods
BM/MNCs were harvested from Lewis rat bone marrow. The EPCs were obtained after BM/MNCs, and cultured by EBM-2 medium for seven days. Lower limb ischemic models were made with Lewis rats. After limb ischemic models were made, 0.8ml D-Hanks , 8×10^6 BM/MNCs and 8×10^6 EPCs were injected into the control group (n =6), BM/MNCs group (n =6), and EPCs group (n =6) respectively. At 3 weeks after D-hanks injection/cell transplantation, the quantity of collateral vascularization was observed with digital subtraction angiography (DSA). Meanwhile, the CD31 and α-SMA of the gastrocnemius muscle obtained from the ischemic limbs were tested with immunohistochemical stain.

Results
There was no significant difference between the BM/MNCs group and EPCs group in the density of the capillaries (31.67±7.87↑/HP vs 32.83±5.38↑/HP, P>0.05), the number of collaterals (4.17±0.75 vs 4.50±1.38, P>0.05), and the density of arterioles (4.83±1.47 vs 5.50±2.35, P>0.05), which were higher than control group, respectively.

Conclusion
The role of non-endothelial progenitor cells in angiogenesis requires more attention in the treatment of stem cells transplantation for limb ischemic disease.

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14.25 **A Clinical Study of the Amount and Mean Volume of Platelets in Elderly Patients:** Chunmei Wang, MD, Jian Zhang, MD, Jian-xin Li, MD, Yong-quan Gu, MD, *Department of Vascular Surgery, Xuan Wu Hospital, Institute of Vascular Surgery, Capital Medical University, Beijing, China.*

Objective
Our objective was to investigate the relationship of the amount of platelets and the mean platelet volume (MPV) in elderly patients.

Method
One hundred fifty (150) patients admitted to the intensive care unit (ICU) were divided into three groups: SIRS0 (non-SIRS), SIRS, and MODS. HEMACELL Plus was applied to examine the amount and mean volume of platelets.

Results
Our results indicate the amount of platelet has decreased gradually, while the MPV increased in all three groups.

Conclusion
As the patient's condition became worse, the amount of the platelets decreased, and the MPV increased. The amount of the platelets and the value of MPV could reflect the condition of the elderly patients.

14.30 **The Effects of Gradual or Acute Arterial Occlusion on Skeletal Muscle Blood Flow, Arteriogenesis, and Inflammation in Lewis Rats with Ischemia of the Hind Limbs:** Sheng-jia Yang, MD, Bin Chen, MD, Tao Luo, MD, Shu-wen Zhang, MD, Xiaolin Shi, MD, Bin Zhang, MD, Jian Zhang, MD, Zhu Tong, MD, *Vascular Department and Regeneration Testing Laboratory, Xuan Wu Hospital, Capital Medical University, Beijing, China.*

Objective

We developed a rat model of chronic hind limb ischemia with a suture method, and compared the effects of chronic ischemia in limb muscles to those with acute ischemia of hind limb skeletal muscles.

Method

We established a model of chronic ischemia of the hind limbs by introducing a suture into the femoral artery. Chronic ischemia caused blood flow, as measured by laser Doppler scanning and angiography. We confirmed chronic ischemia by muscle H.E staining and a-actin immunohistochemistry staining 7 days, 14 days, 28 days, 42 days, and 49 days after operation.

Results

Histology analysis showed chronic hind limb ischemia preserved muscle mass and architecture. While lacking the muscle necrosis and inflammatory cell infiltrates as seen after acute ischemia, the chronic ischemic group recovered dermal blood flow more slowly, and less completely than did the acute ischemic group, at 49 days post-operatively. The arteriole density of the quadriceps is much lower, than that of the acute ischemic hind limb models 7 days after operation.

Conclusion

We describe a kind of model of chronic hind limb ischemia in Lewis rats by a suture method resulting in a difference in blood flow recovery as it correlates with distinct patterns of muscle necrosis and inflammatory cell infiltration. The differences between the models of acute and chronic hind limb ischemia may have important consequences for future studies of mechanism regulating arteriogenesis, and therapeutic approaches aimed at promoting arteriogenesis in humans suffering from critical limb ischemia.

14.35 **Changes in Endothelial Progenitor Cells after Bone Marrow Stimulation:** Zhu Tong, MD, Yong-quan Gu, MD, Jian Zhang, MD, Jian-xin Li, MD, Shu-wen Zhang, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital, Institute of Vascular Surgery, Capital Medical University, Beijing, China.*

Supported by the National High Technology Research and Development Program of China (2006AA02A134), Natural Science Foundation of Beijing (7072031), and National Natural Science Foundation of China (30471708)

Objective

Our objective was to observe the changes in the number and function of bone marrow-derived endothelial progenitor cells (EPCs) after bone-marrow stimulation, and investigate the possible mechanism of autologous bone-marrow stem cell implantation to improve ischemic limb disease after bone-marrow stimulation.

Methods

Twelve Lewis rats were enrolled with bone marrow stimulation group (n =6), and control group (n =6). In the stimulation group, the bone marrow of each rat was stimulated by injection of rhG-CSF. Mononuclear cells were harvested from the bone marrow and cultured in EBM-2 medium. After a 7-day culture, EPCs were characterized as DiI-acLDL /FITC-UEA-I double positive cells detected by fluorescent microscope. The adherent function of EPCs was determined by counting the number of recultured EPCs. Unilateral ischemic hind limb models were Lewis rats. Three days later, EPCs were transplanted into the ischemic tissue. According to the difference EPCs resource, twelve (12) rats were divided into 2 groups: stimulation group (n=6), and control group (n=6). At 3 weeks after EPCs transplantation, the quantity of collateral vascularization was observed with digital subtraction angiography (DSA).

Results

After 7 days culture, the number of EPCs in the stimulation and control group was 145.2±37.0 cells/×200 and 95.2±39.4 cells/×200 respectively. The number of EPCs in stimulation group was significantly higher than in the control group (p<0.05). In both the stimulation and control group, the number of adherent EPCs was 21.8±4.3 cells/×100 and 15.0±5.2 cells/×100 respectively. The difference between the two groups was significant (p<0.05). Compared with control group, the number of the collaterals was significantly higher in the stimulation group (4.2±1.2 vs 2. 7±0.8, p<0.05) after 3-week EPCs implantation.

Conclusion

Bone marrow stimulation increased the number of EPCs, and improved the function concurrently, which may be the reason why autologous bone-marrow stem cells implantation improved the outcome of ischemic limb disease after bone-marrow stimulation.

14.40 **A Study of Transfecting Recombinant pEGFP-heNOS Plasmid into Human EPC and Optimizing its Transfection Conditions:** Chuan-jun Liao, MD, Lian-rui Guo, MD, Bao-zhong Yang, MD, *Department of Vascular Surgery, Beijing ChaoYang Hospital, Affiliated Capital University of Medical Sciences, and Department of Surgery, Xuan Wu Hospital, Capital University of Medical Sciences, Beijing, China.*

Objective

Our objectives were to transfect recombinant plasmid pEGFP-heNOS into human endothelial progenitor cells (EPC) by liposome, and optimize the conditions of transfection.

Methods

Recombinant plasmid pEGFP-heNOS was transfected into endothelial progenitor cells by liposome, changing the quantity of plasmid or liposome. The transfection efficiency was observed by fluorescence microscopy, and the heNOS expression in endothelial progenitor cells was last detected by reverse transcriptase polymerase chain reaction (RT-PCR) and Western blot.

Results

Recombinant plasmid pEGFP-heNOS was transfected into endothelial progenitor cells successfully. When the proportion of plasmid: liposome was 1:1, the transfection efficiency was the highest.

Conclusion

Recombinant plasmid pEGFP-heNOS is effectively expressed after being transfected into endothelial progenitor cells in-vitro and enhanced the transfection efficiency by optimizing the transfection conditions, which provides experimental support for further gene therapy.

14.45 **The Number of Small Arterioles Decreases with Age in a Murine Model with Ischemia of the Hind Limbs:** Jinsong Wang, MD[1,2], Zhenwu Zhuang, MD[3], Rosanana C. Chan, MD[1], Zhenyi Xue, MD[1], Justin Tilan, MD[1], Stephen E. Epstein,MD[1], Shenming Wang, MD[2], Mary Susan Burnett, MD[1], *[1]Cardiovascular Research Institute, MedStar Research Institute, Washington DC; [2]The First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China; [3]Angiogenesis Research Center, Dartmouth Medical School, Lebanon, New Hampshire.*

Objectives

The objective was to investigate the mechanisms contributing to impaired blood flow recovery in old mice, and to determine whether transplantation of bone marrow cells from young donors could improve the blood flow recovery in old recipients.

Methods

Lethally irradiated young and old wild type (wt) C57BL/6J mice received bone marrow from either young or old donor mice over-expressing β-galactosidase. After a six week recovery period, acute hind limb ischemia was induced, and blood flow recovery was followed using laser Doppler perfusion imaging. Calf tissue was harvested and cryo-sectioned, and donor cells were traced by X-gal staining. The protein expression of endothelial nitric oxide synthase (eNOS) in calf tissue between young and old mice was compared using western blot. Microscopic computed tomography (microCT) was used to assess vessel numbers in young and old wt C57Bl mice, and young eNOS knockout mice immediately following hind limb ischemia. Aortic smooth muscle cells (ASMC) from young and old mice were isolated, and MMP9 mRNA and protein levels were analyzed using Real time PCR and ELISA.

Results

Young mice demonstrated superior blood flow recovery compared to old mice, regardless of the age of the donor cells. However, bone marrow cells derived from young donors showed better recruitment to the ischemic calf than cells derived from old donors. Old mice had a lower a expression of eNOS in calf tissue compared to young mice. MicroCT analysis showed a decrease in the number of pre-existing small arterioles in both older mice, as well as eNOS knockout mice, compared to young wt C57BL/6J animals. Both mRNA and protein levels of MMP9 were lower in the old ASMC, than in the young ASMC.

Conclusions

A loss of small pre-existing arterioles contributes to poorer blood flow recovery observed with age, following acute hind limb ischemia. Bone marrow cells do not appear to play a major role in flow recovery in this model. The decreased levels of eNOS observed in older mice may contribute to the loss of small vessels with age. Impaired excretion of MMP9 in the old ASMC, may contribute to the attenuated the arteriogenesis observed in the old mice.

Monday, October 26, 2009
15.30 h. – 16.00 h.
Tenth Scientific Session

Other Peripheral Vascular Disease
Scientific Poster Presentations

Moderator:

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

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15.30 **General versus Vascular Surgeon: Impact of a Vascular Fellowship on Clinical Practice, Surgical Case Load, and Lifestyle:** Randall W. Franz, MD, FACS, RVT, FICA, *Vice President, International College of Angiology; Editor, International Journal of Angiology; Grant Vascular and Vein Center, Columbus, Ohio.*

Abstract

- An applicant shortage exists for vascular surgery residents
- Practicing general surgeon examines changes in practice, case load and lifestyle pre- and post-vascular fellowship
- Operative logs, statistical analysis, and changes in career and personal life were examined
- Vascular case load increased three-fold
- Shift in practice from major open to venous and endovascular procedures
- Increased case complexity
- Greater career opportunity and satisfaction
- Increased flexibility benefiting lifestyle and family

Introduction

- General population is aging (Baby Boomers)
- Epidemics of obesity & diabetes
- Lifespan increasing d/t successful treatments of previously fatal vascular system diseases (stroke, CAD, renal failure)
- Older patients have significant comorbidities
- Complex perioperative care is required for very ill vascular patients
- By 2030 an additional 1,067 vascular surgeons are projected to be needed to join in Fellowship positions increased by 34% between 1997 and 2004, but applications decreased by 21% for the same time period
- Residents site poor mentorship, financial considerations and surgery lifestyle for not choosing vascular and general training programs
- Increased uncertainty of the role of vascular surgeons d/t competition by interventional practioners

Changes in Training

- As of February 2006 general surgery certification is no longer a prerequisite
- Four different training paradigms:
  - Standard 7 year = 5 years in general residency + 2 years vascular
  - Early Specialization = 4 years of general + 2 years vascular (all in same institution)
  - 3+3 Program = residents who match in initial surgical training only
  - 5 Year Integrated = trainees who match during medical school
- Different programs allow choice of vascular certification alone or with general certification

Methods & Results

- Retrospective review of operative logs pre- and post-vascular fellowship
- Procedures categorized according to Residency Review Committee for Surgery as in Cronenwett's review of vascular surgery training
- Comparisons made only if 5 or more performed pre- and post
- Mean number of vascular procedures per year increased from 143 to 460
- Case pattern shifted from major open to more minor open and endovascular
- Increased range and complexity of endovascular procedures post-fellowship

Discussion

- Vascular specialization allowed for increased exposure to cases and competitive advantage to be privileged in larger institutions
- Ability to medically manage more complex patients with multiple comorbidities
- Training in the latest venous and endovascular techniques not available to general surgeons
- Increased referrals for venous disease management
- General surgeons performing fewer vascular procedures - vascular surgeons are specialists for treatment of PVD
- Increased volume leads to job and financial security
- Career flexibility and mobility is increased with specialization
- Vascular surgery is a smaller, tight-knit community
- More academic opportunities and research support

Conclusion

- Despite growing need and increase of position availability, number of well-qualified applicants continues to decrease
- Combined certification is especially beneficial for practice outside major metropolitan areas
- The challenge of providing the best vascular surgery care directly related to trainee recruitment
- Increased satisfaction related to: volume, complexity, income, autonomy, control over career and flexibility
- Meaningful career-both professionally and personally rewarding
- Recommendation: medical students and residents interested should explore specialty early, seek mentors in
  vascular surgery, and enter pathways as early as possible in career

15.35 **Management of Upper Extremity Arterial Injuries at an Urban Level I Trauma Center:** Randall W. Franz, MD, FACS, RVT, FICA[1], *Vice President, International College of Angiology; Editor, International Journal of Angiology;* Robert B. Goodwin, DO[2], Jodi F. Hartman, MS[3], Michelle L. Wright, MPH[3], *[1]The Vascular and Vein Center at Grant Medical Center, Columbus, Ohio; [2]Doctors Hospital, Columbus, Ohio; [3]Orthpaedic Research & Reporting, Ltd., Gahanna, Ohio.*

Introduction

Although relatively uncommon, upper extremity arterial injuries are serious and may significantly impact the outcome of the trauma patient. Management of upper extremity arterial injuries at an urban level I trauma center was reviewed to determine incidence, assess the current management strategy, and evaluate hospital outcome. Upper extremity trauma patients with arterial injury who presented between January 2005 and December 2006 were included in this retrospective review. Data collected included age, gender, race, mechanism of injury, type of injury, associated upper extremity injuries, concomitant injuries, injury severity score (ISS), diagnostic modalities employed, surgical procedures and interventions, mortality, length of stay, and discharge disposition. Statistical analysis between blunt and penetrating arterial injuries as well as between proximal and distal arterial injuries also was conducted.

Background

- Upper extremity arterial injuries are uncommon, but serious and can significantly affect trauma patient outcomes
- If not properly managed or treated, upper extremity arterial injuries can lead to limb loss or death
- In multiple trauma victims, upper extremity injury is a significant predictor of hospital length of stay
- Recent advances in diagnostic modalities and vascular techniques require continual reassessment of the management of these injuries
- We performed a retrospective review of 2 years of data to assess upper extremity arterial injury management at our Level I Trauma Center and identified 28 patients with upper extremity arterial injuries

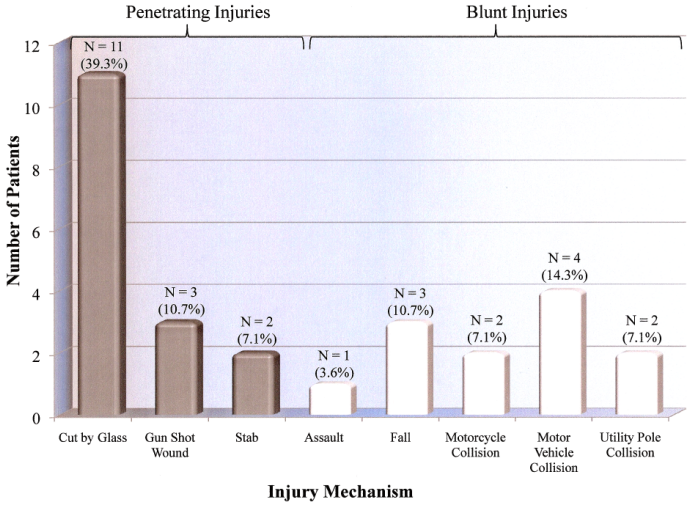

Figure 1. Mechanisms of injuries suffered

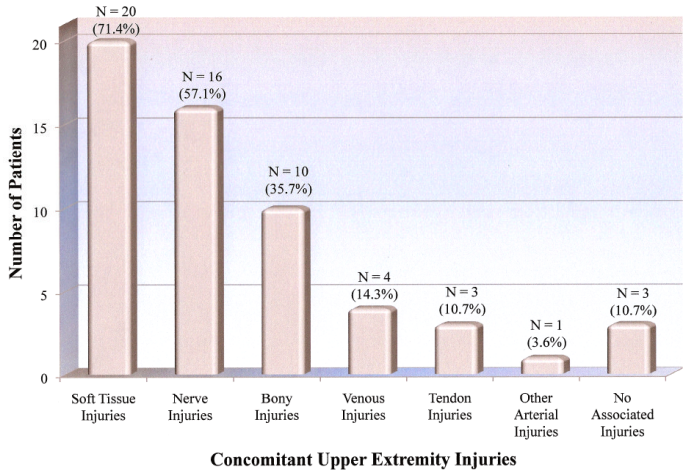

Figure 2. Mechanisms of injuries suffered

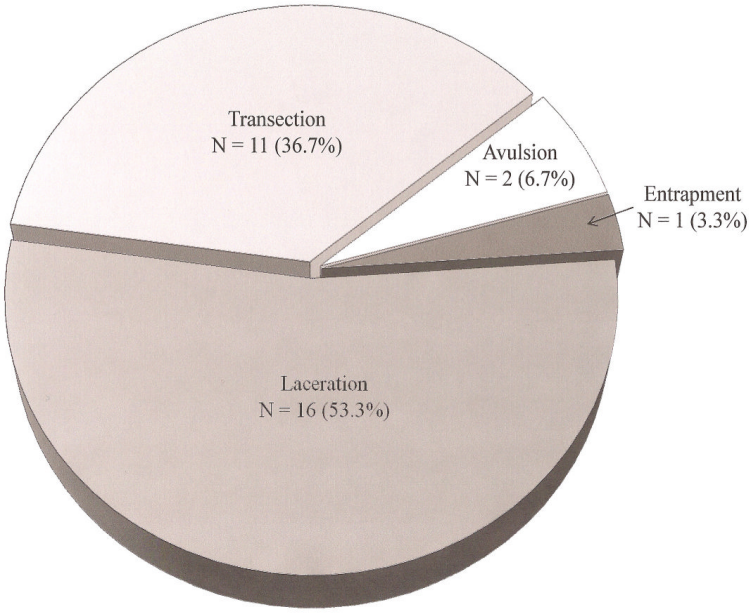

Figure 3. Distribution of injury types

Injured Artery	Overall N=30	Penetrating N=18	Blunt N=12
Axillary	3 (10.0%)	0 (0.0%)	3 (25.0%)
Brachial	12 (40.0%)	7 (38.9%)	5 (41.7%)
Radial	7 (23.3%)	5 (27.8%)	2 (16.7%)
Ulnar	8 (26.7%)	6 (33.3%)	2 (16.7%)

Table 1. Distribution of involved arteries

Treatment Type	Overall N = 30	Axillary N = 3	Brachial N = 12	Radial N = 7	Ulnar N = 8
Bypass	**6 (20.0%)**	**0 (0.0%)**	**6 (50.0%)**	**0 (0.0%)**	**0 (0.0%)**
Endovascular • Embolization • Endograft Repair	**2 (6.7%)** 1 (3.3%) 1 (3.3%)	**2 (66.7%)** 1 (33.3%) 1 (33.3%)	**0 (0.0%)**	**0 (0.0%)**	**0 (0.0%)**
Ligation	**8 (26.7%)**	**0 (0.0%)**	**0 (0.0%)**	**3 (42.9%)**	**5 (62.5%)**
Primary Repair • Micro • End-to-End • End-to-End w/ Thrombectomy	**14 (46.7%)** 3 (10.0%) 3 (10.0%) 8 (26.7%)	**1 (33.3%)** 0 (0.0%) 1 (33.3%) 0 (0.0%)	**6 (50.0%)** 0 (0.0%) 0 (0.0%) 6 (50.0%)	**4 (57.1%)** 2 (28.6%) 1 (14.3%) 1 (14.3%)	**3 (37.5%)** 1 (12.5%) 1 (12.5%) 1 (12.5%)

Table 2. Surgical management of arterial injuries

	Proximal		Distal	
	Axillary or Axillary/ Subclavian	**Brachial**	**Radial**	**Ulnar**
Present Study	3 (10.0%)	12 (40.0%)*	7 (23.3%)	8 (26.7%)
Cikrit et al (1990)[10]	13 (12.9%)	23 (22.8%)	40 (39.6%)*	25 (24.7%)
Diamond et al (2003)[2]	7 (25.0%)	9 (32.1%)	12 (42.9%)	
Joshi et al (2007)[4]	4 (23.5%)	11 (64.7%)*	1 (5.9%)	1 (5.9%)
Myers et al (1990)[15]	11 (11.6%)	22 (23.2%)	28 (29.5%)	34 (35.8%)*
Pillai et al (1997)[5]	8 (38.1%)	10 (47.6%)*	3 (14.3%)	0 (0.0%)

Table 3. Arterial involvement distribution among published upper extremity arterial trauma studies

Results

- 28 patients with 30 arterial injuries
- 27 of 28 patients were successfully repaired, for 96.4% limb salvage rate (1 subsequent amputation)
- Surgical management occurred within 6 hours in all cases
- All patients survived to discharge
- 11 patients required ICU admission
- Patients with proximal injuries were more likely to require ICU admission than patients with distal injuries ($p=0.008$, power = 0.832, OR = 12.0, 95% CI 1.9-75.7)
- Patients with blunt injuries were more likely to have concomitant orthopaedic injuries than patients with penetrating injuries ($p<0.001$, power)

Discussion

Equivalent demographics, mechanism of injury and surgical management approaches as well as successful hospital outcomes were demonstrated in both blunt and penetrating injuries, as well as between proximal and distal injuries. Our current management approach, including the use of angiography and prompt surgical management, results in successful outcomes after upper extremity arterial injuries, and will continue to be utilized at our institution.

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Monday, October 26, 2009

15.40 **Treatment of Severe Acute Deep Vein Thrombosis of the Lower Extremity:** Yong-quan Gu, MD, Li-xing Qi, MD, Jian Zhang, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital and Institute of Vascular Surgery, of Capital Medical University, Beijing, China.*

Purpose
The purpose of this study was to explore the methods and effectiveness of treatment for severe acute deep venous thrombosis (DVT) of the lower extremity.

Methods
Eighteen patients with severe acute DVT were treated in our hospital from January 1, 2002 to December 31, 2008, and retrospectively analyzed. All patients had limb edema and pain. Sixteen had cyanotic limbs, two had limb pallor, ten had weakened pulses in the dorsalis pedis artery, and eight had silent pulses in the dorsalis pedis artery. One had calf skin ulcer and foot gangrene. Color Doppler ultrasonography revealed DVT and superficial venous thrombosis in all diseased limbs. One patient underwent an above-knee amputation for limb gangrene. Seventeen underwent surgical thrombectomy, of which three were simple thrombectomies; five were supplemented with suprapubic saphenous vein bypasses, six with suprapubic PTFE graft bypasses, and three with iliac vein lysis angioplasty.

Results
One patient died (5.6%) on the third day after surgery. Limb edema was relieved in seven patients (41.2%), and reduced in ten patients (58.8%). All diseased limbs regained normal artery pulsation and skin appearance except for one amputated limb. Sixteen patients (94.1%) were followed-up by a mean of 34 months. Limb edema disappeared in five patients (31.3%), reduced in eight patients (50%), and recurrent in three patients (18.7%). Among the three recurrent patients, one died of a malignant tumor 9 months after surgery and two had their grafts occluded resulting from intimal hyperplasia.

Conclusions
Surgical thrombectomy is an effective method for treating severe acute DVT of the lower extremities.

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15.45 **Techniques of Varicose Vein Treatment:** Zhidong Ye, MD, Peng Liu, MD, Fei Wang, MD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China.*

Objective
The surgical treatment of varicose veins was first described by Mayo and later by Babcock at the beginning of the twentieth century and was based on crossectomy, ligation, and stripping. At the end of the eighties, a new concept was described to treat varicose vein disease. Research aiming for less invasive surgical treatment developed new methods and techniques. The objective of this study was to explore various surgical treatments, and its clinical outcome for varicose veins.

Methods
Nearly 4000 patients with varicose veins received various surgical treatment in our hospital from July 2000 to February 2009. Conventional stripping, invaginated vein stripping, endovenous laser therapy (EVLT), radiofrequency endovenous occlusion (RFO), transilluminated powered phlebectomy (TIPP), foam sclerotherapy, and other combined assisted treatments such as cutting, electric coagulation, and transfixation for vein clusters as additional methods were used.

Results
Satisfied surgical results with disappearing reflux were obtained in all cases in the early results. We also reviewed related articles for further study.

Conclusions
Though the traditional surgical procedure to treat varicose veins combining crossectomy and stripping is the main method in China, it can no longer be considered standard. According to the degree of varicose veins and patient's tolerance, appropriate combined methods are the choice and key point in treatment.

Tuesday, October 27, 2009

08.00 h. – 11.30 h.

Eleventh Scientific Session

Peripheral Vascular Surgery

Moderators:

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

Chang Shu, MD
Professor of Surgery; Vascular Department of the 2nd Xiang-ya Hospital, Central-South University, Changsha, China.

Shen-ming Wang, MD
Professor of Surgery, Department of Vascular Surgery, Zhongshan University First Hospital, Guangzhou, China.

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08.00 **Development of Minimally Invasive Treatment on Great Vessel Diseases in China:** Zhong Gao Wang, MD, PhD, FICA, FSVS, Professor of Surgery; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* Honorary Chairman, Local Organizing Committee, 51st Annual World Congress; Vascular Institute and Xuan Wu Hospital, Capital University of Medical Science, Beijing, China.

Vascular surgery in China has lagged behind, especially endovascular surgery, which was from none to a little, a little to quite a lot, a lot to spring up like mushrooms, 雨后春笋. Perhaps Professor Chang knows the meaning of those 4 words, which relies on the development of science. The author has witnessed, and describes this process.

During the Culture Revolution Days, vascular technology and their facilities were not understood, imagined, or even considered. However, the author still reviewed and introduced the Seldinger technique, and studied how to manually make various purpose catheters, and how to carry out selective arterial catheterization before observing it in the early 1970's. After the first set of angiographic machines were introduced to China in the early 1980's, the author studied and performed angiography and related treatments. Therefore, thoughts of how to apply simple techniques to solve complicated problems were engineered. Preliminary endoluminal research began in early 1990's.

Indigenous covered stents, femoral and carotid-jugular traumatic femoral AVFs, abdominal aortic aneurysms, and aortic dissections were first successfully completed in China in 1995, 1996, 1997 and early 1999 respectively by the author.

Professor Masimo of Italy and the author successfully completed the first total aortic replacement with a hybrid method in 1999.

A patient with total aortic dissection accompanied by cardiac ischemia, and another case with deceleration injury, were successfully treated by indigenous covered stents in 2001, and both ranked the first.

Eleven cases with aortic dissection were treated by indigenous covered stents in 1999 by the author. Covered stents with a branch to the left subclavian artery for aortic dissection was studied beginning in 2004, and appeared in the *Journal of Endovascular Therapy* in 2005. Prior to 2005, the author treated 147 cases with aortic dissections. To date in China, the number of covered stents to treat aortic dissection has reached more than 2000.

Tuesday, October 27, 2009

08.10 **Study for the Prevalence of Peripheral Vascular Diseases by Screening Test for Old Male Population in Korea—Preliminary Results:** Jang Yong Kim, MD, FICA[1], Yong Sun Jeon, MD[2], Soon Gu Cho, MD[2], Kee-Chun Hong, MD[1], *[1]Division of Vascular Surgery, Department of Surgery, Inha University School of Medicine, Incheon, South Korea; [2]Division of Interventional Radiology, Department of Radiology, Inha University School of Medicine, Incheon, South Korea.*

Introduction
It is assumed that peripheral vascular disease (PVD) is relatively rare in Asian countries because of the differences in lifestyle from western countries. However, there are a few reports indicating the prevalence of PVD in Asia. Therefore, we have tried to find out the prevalence of carotid artery stenosis (CAS), abdominal aortic aneurysms (AAA), and peripheral artery disease (PAD).

Methods
We studied male volunteers over the age of 65 years, and referred from an old mans association club from November 2008 to April 2009 in Inha University Hospital, Korea. The expected number for this study is at least 1500 for statistical analysis. The screening tests were done by a vascular technician and confirmed by two vascular surgeons and two radiologists. CAS and AAA were screened by Duplex scan. PAD was screened by ankle brachial index (ABI).

Results
One thousand volunteers were screened. The mean age was 71.7 years, and octogenarians were 103 (10%). The prevalence of CAS was 5.2% (≥50%, PSV≥125), and 1.7% (≥70%, PSV≥250). The prevalence of AAA was 2.9% (42, ≥3cm in diameter), and 0.2% (2, ≥5cm in diameter). The prevalence of PAD was 4.2% (42, ABI<0.9), and 0.3% (3, ABI<0.4).

Conclusion
The prevalence of PVD in Korea is similar to previous reports from western countries. Korea is an aging society and is expected to become an aged society in 10 years. Prevention and management of PVD for old people is an important issue, as is in western countries, and this study has provided basic data for that conclusion.

Tuesday, October 27, 2009

08.20 **Wang-Zwische Double Lumen Cannula (DLC) from Jugular Vein to Vena Cava—The Broadway to Percutaneous Ambulatory Paracorporeal Artificial Lung (PAL):** Dongfang Wang, MD, PhD, FICA, Joseph B. Swischenberger, *Department of Surgery, University of Kentucky Medical College, Lexington, Kentucky.*

Purpose
To avoid traumatic thoracotomy for paracorporeal artificial lung (PAL) implantation, we are developing a high performance double lumen cannula (DLC) for ambulatory and percutaneous PAL.

Method and Material
W-Z (Wang-Zwische) DLC was designed with a drainage lumen open to both the SVC (superior vena cava) and IVC (inferior vena cava) and an infusion lumen open to the RA (right atrium) separately to achieve no recirculation for sufficient venous drainage to consistently accomplish total gas exchange. W-Z DLC are made by a proprietary dip molding process with the "molded in" flat wire stainless steel spring resulted in a flexible yet kink resistant thin wall (0.1 mm) with one piece construction. Infusion lumen is an ultra thin membrane sleeve to maximize the cross-sectional area of each DLC lumen with minimal blood resistance per given cannula secondary to the ultra thin infusion lumen (plastic membrane sleeve). With the infusion lumen sleeve collapsed, an introducer shaft with a soft blunt tip fits tightly within the drainage lumen to facilitate DLS insertion and advancement to proper position in SVC-RA-IVC.

Six 27 Fr W-Z DLC were tested with compact pump-gas exchanger in six (6) adult sheep (40-55 Kg), two (2) acute sheep study for cannulation training and recirculation, and four (4) sheep for long-term ambulatory PAL study (15-28 days). Under general anesthesia, a small right neck cutdown was applied to expose right jugular vein. After systemic heparinization, W-Z DLC inserted into jugular vein, past SVC, RA, and reached IVC. The primed CentriMag® pump (Levitronix LLC, Waltham, MA) and Affinity® Gas exchanger (Medtronic, Minneapolis, MN) were connected to the W-Z DLC to form a PAL system. The pump was turned on to pump blood through the gas exchanger for respiratory support. All long-term sheep transferred to ICU and recovered from anesthesia. All sheep were free to access water and food with no sedation for the entire experiment.

Results
All 27 Fr W-Z DLC smoothly reached IVC without any difficulty. Acute study showed as low as 2% recirculation rate. One long-term sheep terminated at 15 days, and two at 28 days as scheduled. One sheep terminated at 26 days from mass back hematoma. With 2 l/min blood flow, up to 140 ml O_2 transfer and 230 ml/min CO_2 removal achieved with no need of sedation, no need of blood transfusion, and no need of labor intensive cage side care.

Conclusion
W-Z DLC minimizes recirculation rate, maximizes the cross-sectional flow area at a given DLC size, so as to maximize flow and enhance PAL gas exchange performance. One site percutaneous venous cannulation may allow total gas exchange as an ambulatory PAL circuit.

Tuesday, October 27, 2009

08.30 **The Role of Gender in Vascular Trauma: A Review of the National Trama Data Bank:** Alik Farber, MD, FICA[1], Fernando Joglar, MD[1], Gheorghe Doros, PhD[2], Dennis Rybin, MS[2], Palma Shaw, MD[1], Robert Eberhardt, MD[3]; *[2]Section of Vascular and Endovascular Surgery, Boston Medical Center, Boston, Massachusetts; [2]Boston University School of Public Health, Boston, Massachusetts; [3]Section of Cardiovascular Medicine, Boston Medical Center, Boston, Massachusetts.*

Purpose
Although studies have shown that women have worse outcomes following major vascular surgery, the effect of gender following acute traumatic vascular injury is unknown. We sought to examine the effect of gender on outcomes of vascular trauma in a large national database.

Methods
In the National Trauma Data Bank from 2002-2006, we identified patients aged 18-65 with traumatic vascular injury based on ICD-9 codes. Exclusion criteria were declaration of death on arrival, head trauma, burns, or multiple vascular injuries. To evaluate potential determinants of outcomes we collected information regarding patient demographics; injury severity, location and mechanism (blunt or penetrating); hospital characteristics including type and geographic region; and payment source. Outcomes after vascular trauma included interventions performed, intensive care unit (ICU) and hospital lengths of stay (LOS), complication rates, and mortality.

Results
We identified 14,554 patients with vascular injuries among the 1,309,311 cases in the dataset. The cohort was 17.1% female with a mean systolic blood pressure of 110±42 mmHg. Women were significantly older (37.1 vs. 33.5 years, p<.001), more likely to be white (54.0 vs. 42.4%, p<.001), and to have co-morbidities (30.9 vs. 27.0%, p<.001) compared to men. They were also more likely to have insurance (40.8 vs. 32.0%, p<.001), to sustain blunt injury (59.2 vs. 40.0%, p=<.001), and to have higher injury severity scores (18.2 vs. 16.6, p=.00002). Women were less likely to undergo surgical intervention (40.7 vs. 45.2%, p=<.001) or fasciotomies (4.1 vs. 7.4%, p<0.001), but had a longer overall length of stay (9.5 vs. 8.9 days, p=.05). Despite these differences, female gender did not appear to adversely affect mortality (15.1 vs. 15.7%, p=.389) or complication rates (12.2 vs. 13.0%, p=.278).

Conclusion
There are significant gender differences in the presentation and outcomes of patients with vascular trauma.

Tuesday, October 27, 2009

08.40 **The Role of Plaque Excision in Lower Extremity Interventions:** Felix G. Vladimir, MD, FICA[1], Alik Farber, MD, FICA[2], *[1]Assistant Professor of Surgery, New York Medical College, New York, New York; [2]Associate Professor of Surgery and Radiology, Boston University School of Medicine, Boston, Massachusetts; Chief of Vascular and Endovascular Surgery, Boston Medical Center, Boston, Massachusetts.*

Purpose

Although there are a number of atherectomy devices available for use in peripheral arterial intervention, their efficacy and complication profile has not been rigorously studied. We evaluated our experience with four atherectomy devices in order to determine their role in the armamentarium of the vascular interventionalist.

Materials and Methods

We retrospectively reviewed 198 atherectomy interventions performed to treat lower extremity arterial occlusive disease between July 2006 and March 2009. The following atherectomy devices were used: SilverHawk (ev3, Plymouth MN), Diamondback (CSI, St. Paul MN), Excimer Laser (Spectranetics, Colorado Springs, CO), and Jetstream G2 (Pathway Medical, Kirkland WA). We reviewed lesion location, complication rate, and the need for additional intervention (balloon angioplasty and stenting). We also developed an algorithm to decide which device is better suited for a particular lesion.

Results

Seventy-two percent of lesions treated were above the knee (CFA, SFA and popliteal), and 28% were below the knee (TPT, tibials). There were two major systemic complications (1 renal failure and 1 stroke) and nine minor complications (5 groin hematomas, 1 wound infection, 2 pseudoaneurysms, and 1 deep venous thrombosis). Target vessel related complications included four dissections, three perforations, two vessel thromboses, and one embolization. Three patients required emergent surgical intervention. Plaque excision alone was used in 56% of lesions. Adjunctive angioplasty was required in 15% of lesions. Stents were deployed in 29% of lesions. The Diamondback appears to be a good choice for focal calcified lesions. The SilverHawk device appears to be suited for focal lesions with minimal or no calcium. The Excimer laser appears to be the best choice for occlusion in the tibial vessels or longer SFA/popliteal lesions. The Jetstream G2 device is the best choice for SFA/popliteal longer occlusions with associated thrombus. Patency is similar with all devices (65-75% at 12 months). However, the lesions treated were different and no conclusion could be drawn as to which device is superior.

Conclusion

Atherectomy is a safe procedure with a low risk of complications. Adjunctive procedures are required in a significant number of cases. Additional studies are needed to evaluate long-term vessel patency rates.

Tuesday, October 27, 2009

08.50 **Mid-Term Post-Operative Surveillance of Endovascular Aneurysm Repair (EVAR) and Endoleak Prediction Using Sac Pressure and Volume Monitoring:** Feng Qin, MD, John B. Chang, MD, FICA, FACS, Takao Ohki, MD, PhD, FICA, Justin Rafael, MD, Rajeev Dayal, MD, Luis Davila-Santini, MD, Julio Calderin, MD, Lorena DeMarco-Garcia, MD, Nicole Johnson, MD, Kambhampaty Krishnasastry, MD, FICA, *North Shore University Hospital-Long Island Jewish Medical Center, New Hyde Park, New York.*

Objective
The objective of this study is to evaluate the utility of aneurysm sac pressure and aneurysm volume calculation for EVAR surveillance.

Methods
One hundred seventy-eight consecutive EVARs had concurrent CardioMEMS EndoSure® implantation during January 2007 and December 2008. Post-operative intrasac pressure was measured at 1, 3, and 6 month intervals. Ratio of sac to systemic pressure was measured and recorded for mean (MPI), and pulse (PPI) pressure indexes. CT scans were obtained at every 6 months or anytime an endoleak was suspected. Aneurysm sac volume was recorded as constructed by volume rendering of CTA.

Results
Technical success of EndoSure® implantation was 98% (175/178). No sensor malfunctioned after successful implantation. Mean follow-up was 12.5 months (range 1 - 24 months). In EVAR without endoleak, consistent sac pressure decreased and remained at a plateau (MPI < 0.5, PPI < 0.5) for 24 months. There was a strong correlation (r = 0.87) between diminishing sac pressure and diminishing sac size. Thirty-two endoleaks developed (18.5%). Five type I and III endoleaks (3%) were discovered by sac pressure elevation (MPI > 0.5) and pulsatile waveform (PPI > 0.5, PPV 100%). Twenty-seven type II endoleaks (15.5%) were suspected with variant MPI elevation (> 0.5) but normal PPI (< 0.5) (PPV 100%). Endoleaks with markedly elevated sac pressure were followed by sac volume expansion.

Conclusion
Surveillance of EVAR can be safely achieved by sac pressure monitoring up to 2 years. The type of endoleak can be predicted based on the character of sac pressure elevation. Suspected endoleaks should be further examined by CTA with sac volume quantitation. Consistent sac pressure elevation with sac volume expansion warrants aggressive intervention.

Table 1. Summary of sac pressure and volume change during EVAR surveillance

	N = 175	MPI	PPI	Sac volume
No endoleak	143	< 0.5	< 0.5	Decrease
Type I or III endoleak	5	> 0.5	> 0.5	Increase if MPI > 1.0
Type II endoleak	27	> 0.5	< 0.5	Increase if MPI > 1.0

Tuesday, October 27, 2009

09.00 **Endovascular Treatment of Superior Mesenteric Artery Stenosis:** Bao-zhong Yang, MD, Sheng-Han Song, MD, Wang-De Zhang, MD, Chao Yuan, MD, Tan Li, MD, Biao Yuan, MD, Ke-Qin Wang, MD, Tong Xing, MD, Yang Zhang, MD, *Department of Vascular Surgery, Beijing Chao Yang Hospital, Capital Medical University, Beijing, China.*

Aim
The aim of this study is to discuss the diagnosis and treatment of ischemic enteropathy resulting from superior mesenteric artery (SMA) stenosis, and evaluate the safety and efficacy of endovascular interventional techniques for SMA stenosis.

Methods
Four cases with SMA stenosis were treated with percutaneous transluminal balloon angioplasty (PTA) and stent placement. During 3 to 32 months of follow-up, we observed the efficacy of endovascular interventional techniques for SMA stenosis as well as the prognosis of patients.

Results
PTA and stent placement were technically successful in all the cases. Among the four cases, three were implanted with one stent, and one case was implanted with two stents. Following the procedure, the symptoms were relieved in three cases within 1 week. Their body weights increased to the ideal level during 3 to 6 months. In the remaining one case, there was conspicuous alleviation of abdominal pain, but she still had intermittent abdominal discomfort. The patient did not have recurrent symptoms, however, died from acute myocardial infarction in the 32th month after the procedure. During the follow-up period, there was no restenosis in all cases, which was assessed by Duplex sonography.

Conclusion
Computerized tomographic angiograms, magnetic resonance angiograms (MRA), and selective angiograms of the SMA are important methods for the diagnosis of SMA stenosis. Stent assisted angioplasty is safe and effective in the therapy of mesenteric arterial occlusive disease, with a low incidence of complication, and high technical success rate, especially for those patients with a high surgical risk.

Tuesday, October 27, 2009

09.10 **Below-Knee Balloon Angioplasty for the Treatment of Severe Diabetic Lower Extremity Ischemia:** Yong-quan Gu, MD, Heng-xi Yu, MD, Li-xing Qi, MD, Xue-feng Li, MD, Lian-rui Guo, MD, Shi-jun Cui, MD, Ying-feng Wu, MD, Zhu Tong, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital of Capital Medical University, Beijing, China.*

Purpose
The purpose of this study is to explore the efficacy of below-knee balloon angioplasty for the treatment of severe diabetic lower extremity ischemia.

Methods
The clinical data of 116 patients with type II diabetes mellitus in 135 ischemic limbs was retrospectively analyzed. Of the diseased limbs, 78.5% were accompanied with coldness, 40% with numbness in the calf or foot, 53.3% with rest pain, 28.2% with foot ulcer, and 18.5% with foot or toe gangrene. The value of ankle/brachial index (ABI) was 0 in 45 limbs, between 0.1-0.5 in 37 limbs, and between 0.51-0.8 in 53 limbs. An antegrade puncture in the femoral artery was made in all patients. Proximal arterial lesions in the diseased limbs were treated at the same time in 41 patients with 49 limbs. Foot arteries were treated in 8 patients with 8 diseased limbs.

Results
The overall technical success rate was 95.7%. Rest pain was totally relieved in 71.7% diseased limbs, and partially relieved in 28.3% diseased limbs, 21.6% foot ulcers healed, 62.2% foot ulcers retracted, and 16.2% ulcers were unchanged. Six (6) limbs with gangrene healed after local amputation, 8 limbs with gangrene improved following repeated debridement, and 5 limbs with dry gangrene remained untreated on discharge. The total amputation rate was 4.4%. Post-operative ABI values increased in all patients. Stroke occurred in 4 patients and myocardial infarction in 3. One patient died in each case within the first week after operation, 92.7% patients were followed-up for 21.5 months on average. Limb pain recurred or was aggravated in 23.9 formerly diseased limbs, and 4.4% limbs underwent below-knee amputation. Improvements were found in all the limbs with foot ulcers or gangrene.

Conclusions
Below-knee arterial balloon angioplasty is simple, effective for the treatment of diabetic lower extremity ischemia, and worthwhile to be advocated. Its long-term effectiveness requires further studies in order to access recurrence.

Tuesday, October 27, 2009

09.20 **Endovascular Repair: An Alternative Treatment for Ruptured Abdominal Aortic Aneurysms?** Wei Guo, MD, Hong-peng Zhang, MD, Xiao-ping Liu, MD, Tai Yin, MD, Xin Jia, MD, *Department of Vascular Surgery, The General Hospital of People's Liberation Army, Beijing, China.*

Background
As an alternative to open aneurysm repair, endovascular aortic repair (EVAR) has been applied to ruptured abdominal aortic aneurysms (rAAA). The aim of this study is to evaluate the immediate and long-term outcomes of EVAR for rAAA.

Methods
From July 1997 to September 2007, 20 men and 6 women with rAAA (median age, 68 years) were treated with EVAR. Most patients with suspected rAAA underwent emergency computed tomographic angiography (CTA). The procedure was performed under general or local anesthesia. Endovascular clamping was attempted in hemodynamically unstable patients. Bifurcated endografts and aorto-uni-iliac (AUI) endografts with crossover bypass were used. Patients had CT scan prior to discharge, and at 3, 6, 12 months after discharge, and annually thereafter.

Results
The time between diagnosis and EVAR ranged from 1 hour to 5 days. EVAR was performed under general anesthesia in 21 patients, and under local anesthesia in 5 patients. Endovascular aortic clamping was performed in 4 patients. There was no conversion to open surgery during EVAR. Stent graft insertion was successful in all patients. One patient died during EVAR from acute myocardial infarction. Ten patients had a systolic blood pressure of <80 mm Hg. Eleven patients received a blood transfusion. The mean aneurysm size was 47±12 mm. Mean ICU stay was 8±3 days, mean hospital stay 18±6 days, and mean procedure time 120±32 min. The 30-day mortality was 23% (6/26 patients), and major morbidity 35% (9/26 patients). Early endoleak occurred in 8/26 patients (31%). The mean follow-up was 18±7 months. No patient demonstrated migration of the stent graft.

Conclusions
EVAR is a safe and effective option for the treatment of acute rAAA, independent of the patient's general condition. Immediate and mid-term outcomes are favorable, the but long-term outcome is unknown. Multi-center studies are necessary to establish the role of EVAR for rAAA.

09.30 **Endovascular Stent Graft Placement in Patients with Type B Aortic Dissection: A Meta-Analysis in China:** Jiang Xiong, PhD, MD, Bo Jiang, PhD, Shen-ming Wang, PhD, MD, FACS, Xin-Yuan Tong, BM, Wei Guo, MD, *Department of Vascular Surgery, LA General Hospital, Beijing, China.*

Objective
The objective of this study was to summarize all published studies for endovascular stent graft placement in patients with type B aortic dissection in China with respect to clinical success, complications, and outcomes.

Methods
A meta-analysis was performed on all published studies of retrograde endovascular stent graft placement encompassing three or more patients with type B aortic dissection. Thirty-nine studies, involving a total of 1304 patients from January 2001 to December 2007 were included.

Results
The average patient age was 52 years. Procedural success was reported in 99.2%±0.1% of patients. Major complications were reported in 3.4%±0.1% patients, with the most severe neurologic complications in 0.6%. Peri-procedural stroke was encountered more frequently than paraplegia (0.2% vs 0%). The overall 30-day mortality was 2.6%±0.1%. In addition, 1.5%±0.1% of patients died over a mean follow-up period of 27.1±17.5 months. Life-table analysis yielded overall survival rates of 96.9% at 30 days, 96.7% at 6 months, 96.4% at 1 year, 95.6% at 2 years, and 95.2% at 5 years.

Conclusion
Although therapy with traditional medicines still remain the first line of treatment for type B aortic dissection, endovascular stent graft placement has shown its advantages, with a success rate of 99% or greater in a select cohort. The technical survival rate, major complications, and acute and mid-term survival rates in the Chi-Q1 nese-language literature appeared to be favorable when compared with that seen in published literature. This analysis is the first to provide an overview of the currently available literature on endovascular stent graft placement in type B aortic dissection in China.

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09.40 **Iliac Vein Compression Syndrome—Outcome of Endovascular Treatment:** Xiaoqiang Li, MD, Qingyou Meng, MD, Hongfei Sang, MD, Jianjie Rong, MD, Aimin Qian, MD, *Department of Vascular Surgery, The Second Affiliated Hospital of Suzhou University, Suzhou, China.*

Background
The purpose of this study was to retrospectively evaluate technical aspects and the significance of percutaneous balloon dilation and stenting for the treatment of left iliac vein compression syndrome.

Method
Between January 1997 and June 2007, 296 patients received interventional therapy in the left common iliac vein. In the second stage, 169 cases underwent saphenous vein high ligation and stripping, and 92 cases received external prosthetic sleeve valvuloplasty. We followed 231 cases over a period of 6 to 120 months (average 52 months), monitoring the patients for improved symptoms, using color ultrasound, and ascending lower extremity venography.

Results
The stenotic or occlusive segments of the left iliac vein were successfully dilated in 283 cases, of which 272 received stent implantation therapy. All of the patients achieved satisfactory results before discharge. During the follow-up period, varicose vein symptoms were alleviated in 95.8% of patients, and leg swelling disappeared or was obviously relieved in 95.7% of cases. About 70% of leg ulcers completely healed, but 4.2% remained unhealed. During venography, we found that 5.4% of stent implants were occluded by a thrombus.

Conclusions
Endovascular treatment with stent placement has a high technical success rate and good long-term patency in the treatment of left iliac vein stenosis or occlusion, an indication that could play an important role in treatment for Crockett's syndrome.

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09.50 **The Impact of Diabetes Mellitus on Results of Revascularization in Patients with Critical Lower Limb Ischemia:** Chuan-jun Liao, MD, Bao-zhong Yang, MD, Tao Jian, MD, Wand-de Zhang, MD, Ke-qin Wang, MD, Tong Xing, MD, *Department of Vascular Surgery, Beijing Chao Yang Hospital, Affiliate of Capital University of Medical Sciences, Beijing, China.*

Objective
The objective of this study was to compare the results of revascularization for critical lower limb ischemia (CLI) in diabetic and non-diabetic patients.

Methods
A retrospective analysis was made on the clinical data of 121 patients who received revascularization for CLI over a 3 year period. Of the 121 cases (130 limbs), 55 cases (60 limbs) were diabetic patients, and 66 cases (70 limbs) were non-diabetic patients. In the diabetic group, 27 limbs underwent surgery, 9 limbs underwent PTA, 20 limbs underwent PTA and stent, and 4 limbs underwent surgery and endovascular therapy. In the non-diabetic group, 28 limbs underwent surgery, 10 limbs underwent PTA, 24 limbs underwent PTA and stent, and 8 limbs underwent surgery and endovascular therapy. The follow-up time was between 3 to 36 months, and compared the peri-operative mortality, 1-year cumulative survival, and amputation-free survival rates between the two groups.

Results
The peri-operative mortality in the diabetes mellitus (DM) group, and the non-diabetes mellitus (NDM) group was 9.1% and 6.1% respectively ($P>0.05$); the 1 year cumulative survival rate in the DM group and the NDM group was 88.1% and 93.1% respectively ($P>0.05$); and the 1 year cumulative amputation-free survival rate in the DM group and the NDM group was 81.6% and 83.4% respectively ($P>0.05$).

Conclusion
Current revascularization practices in DM patients presenting with CLI, indicate similar peri-operative mortality, 1 year cumulative survival rates, and amputation-free survival rates, as compared to those seen in NDM patients. Therefore, the presence of diabetes should not deter vascular surgeons from attempting revascularization.

10.15 **Preliminary Evaluation of Tissue Engineered Venous Grafts Fabricated In-Vitro Based on Endothelial Progenitor Cells:** Ying-feng Wu, MD, Jian Zhang, MD, Yong-quan Gu, MD, Jian-xin Li, MD, Xiao-song Chen, MD, Liang Chen, MD, Bing Chen, MD, Lian-rui Guo, Tao Luo, MD, Chuan-jun Liao, MD, Xin Wu, MD, Heng-xi Yu, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital, Capital Medical University, Beijing, China.*

Objective

The objective of this study was to explore the feasibility of the tissue engineered venous grafts (TEVGs) constructed *in-vitro* based on canine autologous bone marrow-derived endothelial progenitor cells (EPCs) and porcine decellularized aortic scaffolds implanted into the canine inferior vena cava.

Methods

We began by drawing out a volume of 8-12 ml of bone marrow from canines (n=8) to culture and expand EPCs *in-vitro* using conditioned medium. After labeling with a red fluorescent dye PKH26-GL, the cells were seeded onto the luminal surface of decellularized porcine scaffolds with a single, rotative method for 4 hours. Following static culture for 24-72 hours, the hybrids were implanted to replace autologous canine inferior vena cava about 4 cm in length. In the meantime, one femoral artery venous shunt about 1cm long was inserted. The non-seeded decellularized scaffolds (n=4) were treated the same as control. Angiography was performed and the hybrids were explanted for morphology and labeled cells immuno-fluorescence examinations post-operatively at 10 days, 4 weeks, and 12 weeks respectively.

Results

The patent number of experimental (control) group were 7/7 (2/4), 6/6 (2/2), and 4/4 (1/2) post-operatively at 10 days, 4 weeks, and 12 weeks respectively. At 12 weeks, tightly confluence endothelial cells, which covered the whole inner luminal surface of the explants, were detected by immunohistochemistry of factor VIII and scanning electron microscopy, while fibrin-based pseudo intima was detected on the inner luminal surface of the matrix in the solo patent dog from the control group. Meanwhile, fibroblasts and α-actin positive cells in the matrices were found by transmission electron microscopy and α-actin immunohistochemistry. PKH26-GL labeled EPCs sustained on the luminal surface at a rather proportion accompanied by newly formed endothelial cells. However, the explants in both groups showed partial stenosis.

Conclusions

Constructed tissue engineered venous grafts based on canine autologous bone marrow-derived endothelial progenitor cells and porcine decellularized aortic matrices are promising and deserve further improvement and testing.

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10.25 **Femoral to Distal Popliteal Branches Prosthetic Bypass in an Interposition with Autologous Vein:** Peng Liu, MD, Zhidong Ye, MD, Fei Wang, MD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China.*

Objective
Femoropopliteal bypass is still the standard surgical therapy for disabling claudication and critical limb ischemia (CLI). When an autologous vein is not suitable, synthetic, artificial prostheses may be considered. Late patency rate was lower in prosthetic than autologous veins. An interposition prosthetic vein was used for femoral to distal bypass of the popliteal branches to improve patency rate. A single center experience with this method is presented.

Methods
Between January 2005 and April 2009, 39 consecutive femoropopliteal prosthetic bypasses with autologous vein (all below-knee) were performed in 36 patients for disabling claudication (14), and chronic critical limb ischemia (22). Pre-operative angiography showed TASC (II) classification. Type D was found in 29, and Type C lesion was found in 10 cases.

Results
Mean (median) follow-up was 22 months (range 1 to 36 months). There was no mortality within 30 days. Early post-operative bypass thrombosis (0 to 30 days) prompted revision with thrombectomy in 2 cases. Four cases with bypass thrombosis were found in a 1 year follow-up, corrected with PTA and stent.

Conclusion
The use of interposition prosthetic bypass with autologous veins is an alternative method for below-knee femoropopliteal bypass surgery, when an ipsilateral autogenous vein is not suitable. We found the early results to be satisfactory.

Tuesday, October 27, 2009

10.35 **Treatment of Severe Cerebral Ischemia in Takayasu's Disease with Arterial Reconstruction:** Yong-quan Gu, MD, Jian Zhang, MD, Heng-xi Yu, MD, Li-xing Qi, MD, Lian-rui Guo, MD, Shin-jun Cui, MD, Ying-feng Wu, MD, Zhu Tong, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital of Capital Medical University, Beijing, China.*

Aim
The aim of this study was to evaluate the effect of surgical bypass and explore the role of transcranial Doppler (TCD) during bypass surgery.

Methods
From March 2003 to February 2008, sixteen (16) patients (4 males and 12 females) with a mean age of 32, and mean disease course of 7.5 years, were surgically treated in Xuan Wu Hospital of Capital Medical University. The main clinical presentations were dizziness, headache, vertigo, visional dysfunction, etc. Varying degrees of artery stenoses in the four (4) arteries (bilateral carotid and vertebral arteries) were discovered by color Doppler ultrasonography and DSA. Eight (8) patients underwent aorto-bi-subclavian artery prosthetic graft bypasses; three (3) patients underwent aortio-bi-subclavian artery prosthetic graft bypasses and unilateral carotid artery bypass grafts with autologous great saphenous vein; three (3) patients underwent aorto-unilateral subclavian artery-unilateral carotid artery prosthetic graft bypasses; two (2) patients underwent aorto-carotid artery bypass with an autologous great saphenous vein, of which one patient underwent simultaneous aorto-coronary artery bypass. Cerebral blood supply was monitored in fourteen (14) patients with transcranial Doppler. Unilateral subclavian-carotid and femoral-carotid artery shunts were used respectively to avoid cerebral ischemia during surgery in two (2) patients.

Results
Symptoms and signs of cerebral ischemia improved in all patients with an effective rate of 100% apart from deflected tongue-protrusion in three (3) patients, which recovered in 2 weeks following surgery. All patients survived and no symptoms recurred at the end of a 2.2 year follow-up. Unfortunately, two (2) patients developed aneurysms at the anastomosis within 4 years after surgery.

Conclusions
Arterial reconstruction is a safe and effective method for Takayasu's disease with severe cerebral ischemia**.** TCD monitoring plays an important role during the bypass surgery, and can help to determine the revision of blood pressure and prevent post-operative brain reperfusion injury.

Tuesday, October 27, 2009

10.45 **Behcet's Disease with Aneurysm Formation: A Treatment Challenge for Vascular Surgeons:** Bao-zhong Yang, MD, *Department of Vascular Surgery, Beijing Chao Yang Hospital, Capital University of Medical Sciences, Beijing, China.*

Though relatively rare, aneurysms and/or pseudoaneurysms in Behcet's disease may raise treatment challenges because of the frequency of recurrence and risk of life-threatening complications. Four patients in this group underwent repeated operations for recurrent aneurysms and/or pseudoaneurysm formation. The patients who were treated medically (glucocorticoids and immunosuppressants) before and after surgery, resulted in satisfactory therapeutic results. While those patients were treated surgically without any medical intervention during the course of illness, they had a rather poor outcome with recurrent aneurysms and pseudoaneurysm formation. Recognition of this entity and proper management for the primary disease (Behcet's)is of great importance. Therapeutic principles and techniques should be emphasized, and recommended regular follow-ups for every patient.

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10.55 **Biological Formation of a New Vessel through an Experimental Model:** Aurel Andercou, MD, FICA*, Professor of Surgery, University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj Napoca, Romania; Co-Chairman, Membership Committee, International College of Angiology; Editor, International Journal of Angiology;* Aurel Mironiuc, MD, Alexandru Slabai, MD, Octavian Andercou, MD, Octavian Budiu, MD, *Second Surgical Clinic, Cluj Napoca, Romania.*

Purpose
The main objective of the study was the evaluation of the existence of a specific link between the studied surgical procedure and the creation of a biologically newly-formed main arterial vessel, following the respective surgery on the pelvic limb. The secondary objective of the study was the evaluation of the specificity of the link between the studied surgical procedure and the creation of a biologically newly-formed main arterial vessel, following the respective surgery on the pelvic limb.

Materials and Methods
The study sample consist of occlusive arterial lesions at the level of both pelvic limbs, by partial ligature of SFA with non-resorbable monofilament suture, and simulated on 10 laboratory animals, and small mammals (rabbits). The study sample was defined in five steps, according to the research methodology. The participants were included in the study consecutively. The surgical procedure that may induce angiogenesis consisted of the surgical removal of the periosteum of the tibia, near the anterior tibial vascular bundle, at the level of the pelvic limbs of the laboratory rabbits.

Results
Results of the surgical procedure studied were classified as early post-operative (<1 month), late post-operative (>1 month), 1 month post-operative, and were represented separately through aorto arteriography images and graphically through histograms.

The results of the surgical procedure studied were represented by two comparable groups of pelvic limbs, of the same laboratory animals, noted as 1 and 2 below.

1. The group exposed to the studied surgical procedure was formed from 10 pelvic limbs (50%) of laboratory rabbits, which had been exposed to the surgical procedure that may induce angiogenesis, such as the surgical removal of the periosteum of the tibia, near the anterior tibial vascular bundle.

2. The group unexposed to the studied surgical procedure was formed from the other 10 pelvic limbs (50%) of laboratory rabbits, from the sample study, not exposed to the surgical procedure.

Conclusion
The final conclusions drawn from analyzing results, based on the IRE, IRN, AR, RR, REFE indicators and the statistic test for parametric data analysis, the t test with pair samples: a) There were statistically significant differences between the group exposed to the studied surgical procedure, such as the surgical removal of the periosteum near the vascular-nervous bundles, and, b) the group not exposed to the surgical procedure, where a new main arterial vessel formed, post-operatively ($p < 0.05$).

Tuesday, October 27, 2009

11.30 h. – 12.30 h.

Twelfth Scientific Session

Atherosclerosis

Moderators:

Andreia P. Andreev, MD, PhD, FICA

Professor of Surgery; Vice President, International College of Angiology; Editor, *International Journal of Angiology;* President, Bulgarian Association of Vascular Surgeons, Sofia, Bulgaria; President, Vascular Disease Foundation, Sofia, Bulgaria; Head, Department of Vascular Surgery, Saint Ioan Rilski Hospital, Stara Zagoro, Bulgaria.

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Josef 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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11.30 **Effect of Exposure of Apoe-/-Female Mice to Side-Stream Cigarette Smoke on Hypercholesterolemia and Injury-Induced Atherosclerosis:** 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;*
Victor A. Ferraris, MD, PhD, FICA, Alan Daugherty, PhD, DSc, C. Gary Gairola, PhD, *Department of Surgery, University of Kentucky, Lexington, Kentucky.*

Purpose

The purpose of this study was to evaluate the effect of side-stream cigarette smoke (SSCS) on cholesterol levels and atherosclerosis on Apoe-/-female mice.

Materials and Methods

Ten to twelve, week old Apoe-/-female mice were used for the experiment. One week before the operation the animals were started on high fat diet. Endothelial injury was induced by 0.014mm probe. They were divided into 3 groups: control, SSCS group, and SSCS group with dietary curcumin. At 16 weeks, animals were euthanized and evaluated.

Results

1. SSCS increases serum cholesterol.
2. SSCS promotes atherosclerosis.
3. Curcumin did not provide protection against progressive atherosclerosis.

Conclusion

Side-stream cigarette smoke causes hypercholesterolemia and progressive atherosclerosis in Apoe-/-female mice.

Tuesday, October 27, 2009

11.40 Metabolic Syndrome and Peripheral Vascular Disease—What is the Connection?

Thomas F. Whayne, Jr., MD, PhD, FICA, *Professor of Medicine; Co-Chairman, Membership Committee, International College of Angiology; Gill Heart Institute, University of Kentucky, Lexington, Kentucky.*

Abstract

Is there a true "metabolic syndrome" or just a collection of very frequent patient observations that may more appropriately be called a "clinical aggregate" in a population with very bad health habits? Attempts to define such a concept began in 1988 when the term "Syndrome X" was coined to describe resistance to insulin-stimulated glucose uptake, hyperinsulinemia, and hyperglycemia, increased very low density lipoprotein triglycerides, and decreased high density lipoprotein and hypertension. Insulin resistance with compensatory hyperinsulinemia was subsequently suggested to be the causative factor.

Further confusing the issue of whether the designation should be a syndrome or a clinical aggregate of observations is that six different organizations have proposed varying criteria for making a "diagnosis" of metabolic syndrome. To unify these criteria and provide guidance to the practicing clinician, the syndrome/aggregate is defined as the presence of 3 of the 5 following entities: triglycerides ≥150 mg/dl, high density lipoprotein level <40 mg/dl in men and <50 mg/dl in women, blood pressure ≥130/85 mm Hg, waist girth >102 cm (~40 inches) in men or >88 cm (~34.5 inches) in women, and fasting glucose ≥100 mg/dl (also denominated "insulin resistance"). An important point is that each of these components has been reported to have an association with increased levels of high sensitivity C-Reactive protein, which when present, appears to predict an increased risk of peripheral vascular disease (PVD) and coronary heart disease (CHD).

The overlap of PVD and CHD is well established. In a study of ankle-brachial index (ABI) as a correlate of PVD in 273 patients with mean age of 71 years, it was found that of 155 patients with a very low ABI of <0.40, 130 (84%) had 3- or 4-vessel CHD. In another study of 388 patients with PVD, it was reported that metabolic syndrome was present in 59.8% of these PVD patients. Other measures to estimate the presence of PVD, such as carotid intima-media (CIMT), have also been shown to have an association with metabolic syndrome, with increased CIMT related to each metabolic syndrome component added. Therefore, the contribution of syndrome/aggregate to both types of vascular disease is incredibly high. The physician caring for and the surgeon operating on PVD patients is obligated to be aware of the relationship and aggressively treat/modify all components present in each patient as part of the essential preventive management.

The National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP III) estimated that after age adjustment, 24% of adults in the United States have metabolic syndrome. Using the 2000 Census as a standard reference population for age adjustment, this translates to 47 million residents. This group also noted a marked progression in incidence with age, such that those over 60 exceed an incidence rate of 40%. In addition, the NCEP ATP III noted that the Mexican American ethnic group appears to have the highest total age-adjusted prevalence at 31.9%. This high prevalence of metabolic syndrome and the established presence in 59.8% of PVD patients shows a clear connection between the two.

Is this highly prevalent group of symptoms a true syndrome? Regardless of the answer and despite the lack of absolute confirmation that cardiovascular risk in the presence of these components is greater than the risk predicted by them as individual risk factors, emphasis on one of our nation's major medical problems using a term such as "metabolic syndrome" is of significant value. Specifically, the term can be used to emphasize the risk of developing diabetes mellitus and cardiovascular disease when the syndrome's components are present, and the term can be used to promote prevention of these components. On the other hand, designation as a syndrome has major drawbacks as well. One is that some of the major risk factors for cardiovascular disease, such as tobacco abuse and low density lipoprotein elevations, are entirely absent in the five criteria currently used for diagnosis of metabolic syndrome. Furthermore, certain vested interest groups such as pharmaceutical companies want to push the syndrome idea with associated treatment with specific medications for financial gain. All such considerations must be taken into account when assessing potential conflicts or commercial promotion versus pure clinical science.

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Undoubtedly the controversy over metabolic syndrome/aggregate of clinical observations in a population with bad health habits will continue while efforts are ongoing to elucidate and understand the true status. There is no doubt a collection of abnormalities that appear to be both interrelated and linked to our population's health status—which on average is overweight, sedentary, includes a family history of high cardiovascular risk, and can be expected to have an increased incidence of hypertension, elevated blood glucose, low HDL, high triglycerides, and obesity. What is important is to understand that "metabolic syndrome" is a useful term, is not in itself a disease, and that its management centers on individual treatment of each component criterion that is present. This management is essential for PVD patients, whether under the direction of a surgeon, cardiologist, or internist.

Tuesday, October 27, 2009

11.50 **High Sensitivity C-Reactive Protein and Ankle Brachial Index in a Finnish Cardiovascular Risk Population:** Pertti Aarnio, MD, PhD, FICA[1], *Professor of Surgery; Member, Board of Directors, International College of Angiology; Co-Chairman, Scientific Committee and Membership Committee, International College of Angiology; Senior Editor, International Journal of Angiology;* K. Syvänen, MD[1], P. Korhonen, MD[2], P. Jaatinen[3], T. Vahlberg[4], *[1]Department of Surgery, Satakunta Hospital District and University of Turku, Pori, Finland; [2]Central Satakunta Health Federation of Municipalities, Finland.*

Introduction
High sensitivity C-reactive protein (hsCRP) has been previously linked to different forms of vascular disease. However, some studies have not found any relationship between hsCRP and atherosclerosis. In addition, studies investigating the correlation between hsCRP and the ankle brachial index (ABI) are scarce. We studied hsCRP in a cardiovascular risk population with a special interest in the correlation between hsCRP and ABI.

Methods
All men and women aged 45 to 70 years from a rural town, Harjavalta, Finland, were invited to participate in a population survey. Diabetics and people with known vascular disease were excluded. Seventy three percent (n=2085) of the invited persons participated and 70 percent of the respondents (n=1496) had at least one risk factor for cardiovascular disease. These subjects were invited for further examinations. From them we measured ABI, hsCRP, leukocyte count, glucose tolerance, systemic coronary risk evaluation (SCORE), body mass index (BMI), and waist circumference.

Results
Mean hsCRP was 1.9 mg/L. Smokers had higher hsCRP (mean 2.2 mg/L) than non-smokers (mean 1.8 ml/L). HsCRP in females was higher than in males (mean 2.0 mg/L vs. 1.8 mg/L). Mean ABI was 1.10 and the prevalence of peripheral arterial disease 3.1%. ABI correlated weakly with hsCRP ($r=-.077$, $P=0.014$), leukocyte count ($r=-.107$ $P=0.001$) and SCORE ($r=-.116$, $P=0.001$). There was no correlation between age, weight, BMI, or waist circumference. HsCRP correlated with BMI ($r=.208$, $P<0.0001$) and waist circumference($r=.325$, $P<0.0001$). When we excluded subjects with hsCRP >10 mg/L ABI, there was no further correlation with hsCRP.

Conclusions
In a cardiovascular risk population hsCRP has only a weak correlation with ABI and this correlation disappeared when we excluded subjects with hsCRP >10 mg/L. Instead, hsCRP was correlated to the measures of obesity (waist circumference and BMI) indicating its role as a marker of adipose tissue driven inflammation. HsCRP does not seem to be a suitable screening method for PAD.

Tuesday, October 27, 2009

12.00 **Attenuation of the Combined Effects of Cyclosporine A and Hyperlipidemia on Atherogenesis in Rabbits by Thymoquinone:** Ahmed S. Shoker, MD, FRCPC, FICA, Ahmed Ragheb, Ahmed Attia, Fawzy Elbarbry, Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS, *Division of Nephrology, Department of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.*

Purpose
This descriptive study investigates in a rabbit model of atherosclerosis (a) the extent of atherogenesis induced by cyclosporine A (CsA) or hyperlipidemia alone, or in combination, and (b) whether thymoquinone (TQ), a known herbal antioxidant, offers protection against these effects.

Materials and Methods
New Zealand white female rabbits were assigned to five groups of six animals each: Group I, control; Group II, CsA (25 mg/kg/day P.O.); Group III, 1% cholesterol; Group IV, 1% cholesterol + CsA (25 mg/kg/day P.O.); and Group V, 1% cholesterol + CsA (25 mg/kg/day P.O.) + TQ (10 mg/kg/day P.O). Lipids and oxidative stress parameters [Malondialdehyde (MDA) and protein carbonyl], and aortic atherosclerosis were compared.

Results
CsA along did not show a significant effect on either serum lipids, and did not induce atherosclerosis. High cholesterol diet induced atherosclerosis, 45 $\pm$ 11% of the intimal surface of the aorta was covered with atherosclerotic plaque. CsA and high cholesterol diet in Group IV increased atherosclerosis severity as measured from intimal and media lesions, but not the extent of atherosclerosis. TQ decreased aortic MDA by 83%, which was associated with a reduction in the extent of aortic atherosclerosis by 52% compared to Group IV, which significantly attenuates the severity of vessel wall injury.

Conclusions
1) CsA aggravates hyperlipidemia induced atherosclerosis; and
2) TQ attenuates the oxidative stress and atherogenesis induced by the combined effect of CsA and hyperlipidemia.

12.10 **Effects of Pentoxifylline on Platelet Activating Factor Levels in Acute Limb Ischemic-Reperfusion Injury:** Dafzah A. Juzar, MD, Iwan Dakota, MD, FICA, Ismoyo Sunu, MD, Manoefris Kasim, MD, Nani Hersunarti, MD, RWM Kaligis, MD, FICA, Dede Kusmana, MD, Ganesja M. Harimurti, MD, *Department of Cardiology and Vascular Medicine, Faculty of Medicine, University of Indonesia, National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.*

Background

Ischemic reperfusion injury is a paradoxical exacerbation of cell dysfunction and death following the restoration of blood flow to previously ischemic tissue. Restoration of blood flow is essential to salvage ischemic tissue. However, reperfusion itself paradoxically causes further damage to the ischemic tissue, threatening function and viability to both local organs and distally through the inflammation response.

In acute limb ischemia, there are essentially two components: a local component that can result in increasing the regional damage from ischemic inflammation responses, which results in local syndrome, compartment syndrome, and systemic syndrome, multiorgan dysfunction and failure.

Methods

Acute limb ischemia in the left lower limbs of 10 New Zealand white male rabbits were performed for 3 hours followed by a 2 hour period of ischemia. The rabbits were randomly separated into two groups of five (pentoxifylline (PTX) group and control group). The pentoxifylline group was given PTX 40 mg/kg bolus a half hour prior to reperfusion followed by a maintenance dose 1 mg/kg/hour for 2 hours post-reperfusion, while the control group was given normal saline solution with a comparable volume and rate of administration. Acute limb ischemic procedures were performed by direct occlusion of the left femoral artery using non-traumatic clamp, followed by releasing the clamp after 3 hours of occlusion. Levels of PAF were measured after 2.5 hours of the ischemic period, and after 2 hours the reperfusion period.

Results

After 2.5 hours of ischemia, the mean PAF levels did not show any significant difference ($p=0.754$). The mean PAF levels of the pentoxifylline group were 13.09±0.41 pg/mL, while the mean PAF levels of the control group were 13.38±0.28 pg/mL. After 2 hours of the reperfusion period, there were significant differences of mean PAF levels between the two groups ($p=0.009$). The mean PAF levels in the control group increased by 12.11±0.79 to become 25.5±0.78 pg/dL, while the mean PAF levels of the PTX group decreased by 1.73±1.1 pg/mL, and became 11.36±0.78 pg/mL.

Conclusion

PTX decreased the PAF levels in rabbits with acute limb ischemic reperfusion injury.

Tuesday, October 27, 2009

12.30 h. – 13.00 h.

Thirteenth Scientific Session

Special Luncheon Session

Evidence Based Management of Diabetic Foot Ulcers Using Negative Pressure Wound Therapy

Introduction By:

John B. Chang, MD, FICA, FACS

Professor of Clinical Surgery, Albert Einstein School of Medicine; 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:

Bauer E. Sumpio, MD, PhD, FACS, FICA

Professor of Surgery; Co-Chairperson, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Chief, Department of Vascular Surgery, Yale University School of Medicine, New Haven, Connecticut.

The rapid increase in incidence of chronic wounds is driven by the aging population, obesity, and diabetes. Clinicians are also faced with an array of complex wounds from military and domestic trauma as well as complex surgical procedures. Better, cost-effective methods of efficiently closing difficult wounds will reduce the pain and amputation rates associated with complex wounds. Topical growth factors have long been considered a promising method to accelerate wound healing but currently have a rather limited role clinically with only one product available for clinical use in the US. Other methods such as bioengineered skin substitutes have been successful in certain defined areas of wound healing, but most wound care products in use today are based on the principle of moist wound healing.

Vacuum assisted closure (VAC) device was described in 1997. The device consists of a vacuum pump, a canister with a connecting tube, open pore foam, and a semi-occlusive dressing. Since the original report, over 500 peer-reviewed papers in the medical literature have been published describing its effect in a number of wound types. Most of the reports have been case series and retrospective reviews with prospective randomized studies being published in the areas of diabetic foot infection, pressure sores, and skin grafts. The small number of properly performed randomized studies makes it difficult for policy makers to assess efficacy in actual patients. The terminology is also somewhat confusing, using descriptors such as negative pressure wound therapy (NPWT), topical negative pressure (TNP) or sub-atmospheric wound therapy (SAWT). These terms do not emphasize the importance of the wound-foam interface and do not distinguish the VAC device from other suction wound therapies. I will review the current literature on the utility of VAC in the management of diabetic foot ulcers and briefly discuss current knowledge regarding the mechanism of action of the VAC device.

Tuesday, October 27, 2009

13.00 h. – 14.30 h.

Fourteens Scientific Session

Medical and Surgical Treatment of Venous Disease

Moderators:

Guan Heng, MD
Professor of Surgery; Department of Vascular Surgery, Peking Union Medical College Hospital, Beijing, China.

Rajinder P. Sharma, MD, FICA
Treasurer and Member, Board of Directors, International College of Angiology; Editor, *International Journal of Angiology;*

Qinghua Wu, MD
Professor of Surgery; Department of Vascular Surgery, Beijing Anzhen Hospital, Beijing, China.

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13.00 **Symptomatic, Isolated, Distal Deep Vein Thrombosis (DVT)—Whether to Treat or Not with Anticoagulation?** Ashish Anil Sule, MBBS, MD, MRCP(UK), FICA, FAMS[1], Tam Jam Chin, MRCP, FAMS[2], Pankaj Handa, MRCP, FAMS[3], Arul Earnest, MSc[4], *[1]Associate Consultant, [2]Senior Consultant and Head of the Department, [3]Consultant; Department of General Medicine II; [4]Principal Medical Statistician, Tan Tock Seng Hospital, Singapore.*

Purpose

The purpose of this study was to analyze the treatment of isolated, symptomatic, and distal DVT with anticoagulation versus no treatment, and the differences in the outcome.

Materials and Methods

Inclusion criteria: Patients with distal DVT from Tan Tock Seng Hospital (TTSH) from January 1, 2006 to December 31, 2007 were identified.

Exclusion criteria: Those who either had both distal and proximal DVT or had distal DVT along with pulmonary embolism (PE) at presentation were excluded.

Primary outcome measure was complete resolution of distal DVT on repeat Duplex scan.

Secondary outcome measures were complete improvement of symptoms, progression of thrombosis or PE or death during the follow-up period.

Our study included 68 patients with distal DVT. Seventeen patients with PE and two patients with proximal DVT (iliac and common femoral veins) at the first presentation along with distal DVT were excluded from study. In total, 51 patients were included for analysis. The follow-up scan was available in 35 patients. Hence the primary analysis was done for 35 patients (47 incidences of distal DVT). However, the secondary analysis was available in all 51 patients.

Out of the 35 patients, 17 patients (25 incidences of distal DVT) received anticoagulation and 18 patients (22 incidences of distal DVT) did not receive anticoagulation. Seventeen patients who were treated with anticoagulation, 9 patients (13 incidences of distal DVT) received enoxaparin at dose of 1mg/kg twice a day for 2 weeks, and 8 patients (12 distal DVT) received warfarin for a period of 3 months with initial overlap of enoxaparin 1 mg/kg twice a day for 3 -5 days. Enoxaparin was stopped once PTINR on warfarin was between 2 to 3.

Results

There was statistically no significant difference in either the resolution of distal DVT or symptomatic improvement with or without treatment.

Conclusion

Isolated, distal DVT may be observed, and need not be treated with anticoagulation.

13.10 **Results of a Multicenter, Cross-Sectional Venous Thrombosis Screening Study in Izmir and the Aegean Region:** Mustafa Karaçelik, MD, FICA, Erkan Kara[2], İbrahim Erdinç[3], Ahmet B. Özelçi[4], Cenk S. Atalay[5], Emrah Oğuz[6], Makbule Kesici13, Cumhur Tenekeci[10], Ece Tonguç Koçkesen[11], Nurşin Külcü[12], Hakan Filizoğlu[12], Salih T. Kutlu[7], Erol Bahtiyar[8], Ali Gürbüz[4], Tanzer Çalkavur[6], Özalp Karabay[9],*[1]T.C.S.B. Tepecik Egitim ve Arastirma Hospital, Izmir, Turkey; [2]T.C.S.B. Suat Seren Gogus Hastalıklari, Gogus Cerrahisi Egitim ve Arastirma Hospital, Izmir, Turkey; [3]T.C.S.B. Bozyaka Egitim ve Arastirma Hospital, Izmir, Turkey; [4]T.C.S.B. İzmir Atatürk Egitim ve Arastirma Hospital, Izmir, Turkey; [5]T.C.S.B. Buca Seyfi Demirsoy Hospital, Izmir, Turkey; [6] Department of Cardiovascular Surgery, Ege University School of Medicine, Izmir, Turkey; [7]T.C.S.B. Nevvar Salih İsgoren Hospital, Izmir, Turkey; [8]T.C.S.B. Karsiyaka Devlet Hospital, Izmir, Turkey; [9]Department of Cardiovascular Surgery, Dokuz Eylül University School of Medicine, Izmir, Turkey; [10]T.C.S.B. Denizli Servergazi Devlet Hospital, Denizli, Turkey; [11]T.C.S.B. Aydın Devlet Hospital, Aydin, Turkey; [12]T.C.S.B. Mugla Devlet Hospital, Mugla, Turkey; [13]UHG Izmir Ege Saglik Hospital, Izmir, Turkey.*

Purpose

The etiology of deep venous thrombosis (DVT) in patients who have surgical and medical risk factors is well understood, but causes of DVT in Izmir City and the Aegean region is currently not well documented.

Materials and Methods

We enrolled consecutive patients with acute, sub-acute, and chronic DVT, confirmed by Doppler ultrasound, and reviewed records of 14 hospitals in Izmir and the region in a multicenter cross sectional study. The data on patients were recorded on a questionnaire form and analyzed by using Ki-square and Student-t tests.

Results

The patients (245 male; 46.1%, 286 female; 53.9%) with a mean age of 53.7 years, were enrolled into the study between July 2008 to March 2009. Lower extremity DVT was 95.9% and upper 4.1%. DVT was on the right side of 233 patients, the left side of 290 patients, and bilaterally in 8 patients. The patients who had a surgical history over the past 3 months were 36.3% (n=193), and 81.9% (n=435) had medical risk factors. For prophylaxis 483 patients (91%) did not receive any drugs. The patients were treated ambulatory 83.8%, and 15.4% of them were hospitalized. Three hundred eighty-six (72.7%) of the patients were treated with warfarin and LMWH together. Venous thrombectomy (n=3), and vena cava filter (n=2) were applied to the patients. Acute (87.2%), sub-acute (9.2%), and chronic (3.8%) treatment were given. The differences between the localization of DVT and sex were not significant (p=0,486). DVT was seen more frequently following knee surgery (14%). DVT after lung cancer surgery was determined to be 4.1%. The three most frequent medical risk factors were chronic venous insufficiency (25.2%), immobilization (20.7%), and DVT history (20.1%) respectively. DVT rates of immobilized patients was significantly higher than other medical risk factors (p=0,033). VTE in malignant patients (especially urologic cancer) was significantly higher. DVT was diagnosed by Doppler ultrasound at crural 92.5%, popliteal 87.6%, femoral 54.5%, external iliac 13.9%, and common iliac veins respectively.

Conclusion

Chronic venous insufficiency and varicose veins are the most common risk factors for DVT. Orthopedic surgery is the most common risk factors for DVT among the surgical group. Patients with chronic venous insufficiency are the best candidates for DVT. Immobilization enhances the risk of DVT. The prophylaxis rate was low in our study. However, additional population-based studies should be planned. Warfarin and LMWH was used more widely as a treatment of choice instead of the standard heparin.

Tuesday, October 27, 2009

13.20 **Endometriosis Causing Lower Extremity Deep Vein Thrombosis (DVT):** Rajinder P. Sharma, MD, FICA, *Treasurer and Member, Board of Directors, International College of Angiology; Co-Chairman, Scientific and Membership Committee, International College of Angiology; Editor, International Journal of Angiology; Division of Interventional Radiology, Henry Ford Health System, Detroit, Michigan.*

Endometriosis is a medical condition in women where endometrial cells are deposited in areas outside the uterus and continues to be influenced by hormonal changes, and produce symptoms depending on the site of implantation.

We describe a unique case of retroperitoneal endometriosis causing DVT from extrinsic compression of right iliac vein. Clinical presentation with menstrual cyclical leg swelling culminating with DVT, although very suggestive, has never been previously reported.

A 41 year old female presented to the emergency department with right lower extremity swelling and pelvic pain for about a week. She has a 4 year history of back pain and right leg pain associated with leg swelling, cyclical in nature, and coincidental with her menstruation. The only thing different this time was pain and swelling of right leg that did not resolve after menstruation.

Successful treatment of her DVT with transpopliteal thrombolysis revealed severe smooth stenosis of right external iliac vein. This was successfully treated with balloon angioplasty and stenting. CT of the pelvis showed 3 cm soft tissue mass surrounding right external iliac vein. Posterior CT guided biopsy of pelvic mass was positive for endometrioma.

This case will be discussed including medical and surgical options for treatment of endometriosis.

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13.30 **Diagnosis and Treatment of Acute Mesenteric Venous Thrombosis:** Xue-feng Li, MD, Yong-quan Gu, MD, Heng-xi Yu, MD, Jian Zhang, MD, Jia-bank Sung, MD, Zong-jun Dong, MD, Jian-xin Li, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Department of Vascular Surgery, Xuan Wu Hospital, Capital University of Medical Sciences, Beijing, China.*

Objective
The objective of this study is to discuss the experiences of diagnosis and treatment of acute mesenteric venous thrombosis (AMVT) so as to increase the survival rate.

Methods
The clinical data of 11 cases of AMVT were analyzed retrospectively. Computed tomography (CT) was considered diagnostic in 9 of 11 patients. Seven patients with AMVT were initially treated with anticoagulation and thrombolysis; the other 4 patients underwent surgical operation.

Results
Three of 11 patients died (mortality rate 27.3%). Seven patients were initially treated without surgery, and one died (14.3%). Four patients underwent surgical operation, and two died (50%). Eight survivors were treated with long-term warfarin therapy. Seven of the 8 patients survived during long-term follow-up (mean 64.7 months), and there were recurrent symptoms in one patient.

Conclusions
CT scanning appears to be the first and primary diagnostic test of choice when AMVT is suspected. If diagnosed and treated early, AMVT is not likely to progress to gangrenous bowel, and the mortality rate can be decreased. Long-term anticoagulative therapy can increase survival rate and has a low recurrent rate.

Tuesday, October 27, 2009

13.40 **Clinical Application of Temporary Vena Cava Filters in Patients with Lower Extremity Fractures:** Jian-long Liu, MD, Wei Jia, MD, Xuan Tian, MD, Jing-ming Zhao, MD, Ya-bo Liu, MD, Chun-peng Zhao, *Department of Surgery, Beijing Ji-shui-Tan Hospital, Beijing, China.*

Objective
Our objective was to study the necessity and safety of implanting temporary vena cava filters to prevent pulmonary emboli in patients with concomitant acute deep venous thrombosis (DVT).

Methods
Seven hundred eighty-two patients with lower extremity fractures were peri-operative DVT complications. Of those patients, 91 were selected to receive temporary vena cava filter implants before orthopedic surgery to prevent pulmonary embolism. All patients were followed post-operatively.

Results
Vena cava filters were successfully implanted in 89 patients. The mean implantation time was 27 days (range of 14 to 42 days). Thrombus trapped within the filters was found in 78 patients (87.6%) following the removal of the filters. Eighty-two filters (92.1%) were successfully retrieved on the first attempt. Seven filters (7.9%) with large trapped thrombi were removed on the second attempt after additional thrombolytic therapy. None had to be replaced with a permanent filter. No fetal pulmonary embolism (PE) or other manifested complications were detected during the three to six months follow-up period.

Conclusion
Temporary vena cava filters can reduce the incidence and mortality of pulmonary embolism as well as the occurrence of mid- or long-term complications in patients with lower limb fracture complicated by DVT. It seems not necessary to place filters before orthopedic surgery for patients under a pre-thrombotic state.

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13.50 **The Value of a Mini-Incision and Exsanguination during the Operation of Varicose Veins in the Lower Limbs:** Shijun Cui, MD, Jian Zhang, MD, Yong-quan Gu, MD, Jian-xin Li, MD, Sue-feng Li, MD, Lixing Qi, MD, Zhong Gao Wang, MD, PhD, FICA, FSVS, *Vascular Surgery Unit, Xuan Wu Hospital and Institute of Vascular Surgery, Capital University of Medical Sciences, Beijing, China.*

Objective
The objective of this study was to appraise the value of mini-incision and exsanguination during the operation of varicose veins in the lower limbs.

Methods
One hundred ninety-five limbs with superficial varicose veins were divided into two groups; treated group and control group. In the treated group, the diseased limb was exsanguinated and blocked with a tourniquet, and surgically treated with high level ligation and striping with a mini-incision. In the control group, the same operation was carried out but without exsanguination and tourniquet. The operation duration, intraoperative bleeding volume, limb edema, subcutaneous hematoma, and esthesiodermia were noted.

Results
In the control group, the duration of surgery was significantly shortened [(30.89±5.92) min vs (78.60±20.58) min], and the intraoperative bleeding volume was significantly reduced [(24.00±9.30) ml vs (71.67±25.22) ml]. There were no obvious differences among the subcutaneous hematoma, limb edema, and esthesiodermia.

Conclusions
The method of a mini-incision and exsanguination in the operation of superficial varicose veins of the lower limbs is simple, economical, practical, and worthy of recommendation.

Tuesday, October 27, 2009

14.00 **Surgical Approach of the Popliteal Fossa in the Treatment of Deep Femoral Vein Insufficiency:** Jie Ma, MD[1], Tao Ma, MD[2], *[1]Department of Vascular Surgery, Dalian Municipal Central Hospital, Dalian, China; [2]XinJiang Medical University, China.*

Objective
Our objective was to study the role and curative effects of four different surgical approaches in the popliteal fossa to treat deep femoral vein insufficiency (DFVI).

Methods
From March 1999 to October 2008, 69 patients were diagnosed as having DFVI through venography and color ultrasound. According to Raju grade, grade 2:39, grade 3:27, and grade 4:3, 61 patients developed superficial femoral vein insufficiency. Based on CEAP grade, limbs were classified as C_4 52, $C_5$12, and C_6 5. The four surgical approaches that were performed were: (1) encircling construction in the popliteal vein (PV) distal to the entry of the PV into the deep femoral vein (DFV) on 37 patients; (2) ligation in the DFV, and encircling construction in the PV on 22 patients; (3) 8 patients with competent valves of the superficial femoral vein had ligations in the DFV; (4) 2 patients had both the accompanying DFV and PV encircling constructed.

Results
Sixty-two patients (89.8%) were followed from 1-10 years (mean 4.6). The symptoms of pigmentation from the ankle to the middle of the leg, ponderousness, and soreness were gone. Ulcers healed and did not recur. The post-operative ambulatory venous pressure measured was statistically significant (P<0.01), venous recovery time >22 seconds. Post-operative venography proved the contrast media distal to the encircling construction of PV moved back to the heart regularly, and stopped during Valsalva maneuver. During post-operative venography, a standing position (60 degrees from the vertical) is used to record the development time of the contrast media reaching the superior patellar margin, which was statistically significant (P<0.01). The returning blood volume measured, and patient standing, was statistically significant post-operatively (P<0.01).

Conclusion
The reflux caused by DFVI has a negative impact on the hemodynamics of the lower limb. On the basis of venography, the union of DFV and PV, and the condition of SFV, is effective to use the four different surgical approaches in the popliteal fossa to treat DFVI.

Tuesday, October 27, 2009

14.30 h. – 16.30 h.

Fifteenth Scientific Session

Coronary Artery Disease and Other Cardiac Disorders

Moderators:

Iwan Dakota, MD, FICA
Regional Secretary, International College of Angiology; Head, Peripheral Vascular Intervention, Department of Cardiology and Vascular Medicine, School of Medicine, University of Indonesia, National Cardiovascular Center, Harapan Kita Hospital, Jakarta, Indonesia.

Choi-Keung Ng, MD, FICA
Vice President, International College of Angiology; Department of Cardiac Surgery and Cardiology, General Hospital Wels, Wels, Austria.

Thomas F. Whayne, Jr., MD, PhD, FICA
Professor of Medicine; Co-Chairman, Membership Committee, International College of Angiology; Gill Heart Institute, University of Kentucky, Lexington, Kentucky.

14.30 **Norman Bethune—A North American Thoracic Surgeon, Pioneer, Humanitarian, and National Hero in China:** Choon S. Shin, MD, *Clinical Professor of Surgery, Weill Medical College of Cornell University, New York, New York; Director of Surgery, Chief of Vascular and Thoracic Surgery, New York Community Hospital, Brooklyn, New York.*

Dr. Henry Norman Bethune was an innovative surgeon who saved many lives and made many contributions to medicine.

He was born on March 3, 1890 in Gravenhurst, Ontario, Canada, the son of a Presbyterian minister. His grandfather was a well-known surgeon who was a founding member of the University of Toronto where Dr. Bethune received a Medical Degree in 1916. He spent his professional life in Toronto and Montreal, Canada, Detroit, Michigan, and Saranac Lake, New York.

He volunteered for military duty on the battlefield during three different wars, in France during World War I, Spanish Civil War, and China. He saw combat action in France where he learned the value of immediate intervention on the battlefield in saving lives. He established the world's first mobile surgical unit and the world's first mobile military blood bank unit.

As a well-known thoracic surgeon, he provided free medical care for poor people in North America during the Great Depression of 1933. He published numerous papers and he patented many surgical instruments.

He went to China in January 1938 where he treated many wounded soldiers and sick civilians. Chairman Mao Tse-Tung immediately recognized his outstanding surgical skills, selflessness, and compassion. He established battlefront hospitals, military medical schools, educated physicians, and paramedics. He operated on wounded soldiers day and night without rest in his mobile unit.

As medical supplies were running low, Bethune was forced to operate with his bare hands because of the shortage of rubber gloves.

On November 1939 he accidentally cut his finger while operating on a soldier. At the time, casualties were heavy and Bethune continued operating during the next six days. With no antibiotics available, Bethune developed fever and Septicemia and died on November 12, 1939. He was buried in a Military Mausoleum in Shih Zia Zhuang, China. Today almost every Chinese remembers him as a hero. There are numerous hospitals, medical schools, and dental schools named after him and his statues are located in China and Cambodia.

There were many movies made in China, Canada, and the USA honoring Bethune as a great humanitarian, a skillful and dedicated surgeon, medical innovator and a hero.

Tuesday, October 27, 2009

14.40 **Low-Dose Alcohol Septal Ablation for Obstructive Hypertrophic Cardiomyopathy is Effective and Safe:** Josef Veselka, MD, PhD, FESC, FSCAI, FICA, *Editor, International Journal of Angiology;* D. Zemánek, MD, P. Tomašov, MD, S. Homolová, MD, R. Adlová, MD, *CardioVascular Center, University Hospital Motol, Prague, Czech Republic.*

Purpose
Alcohol septal ablation (ASA) is an alternative treatment for highly symptomatic patients with obstructive hypertrophic cardiomyopathy (HOCM). Since a larger infarct may be hazardous and associated with potential long-term risk, we wanted to determine whether low-dose ASA would be both safe and effective.

Materials and Methods
Ninety consecutive patients (55 ± 13 years, range 24-81 years) with highly symptomatic HOCM receiving maximum medical therapy were enrolled. Forty-five patients (Group A) with a septum thickness < 31 mm have been treated with low alcohol dose (1.5±0.5 ml) and compared with a controlled group of 45 patients (Group B) treated by the same medical team using alcohol dose 2.5±0.8 ml in the past. Patients were examined at baseline, immediately after procedure, and 3-5 days, 3 weeks, and 3 months thereafter.

Results
Ninety ASA procedures were successfully performed. The early peak of CK-MB was 3.79 ± 2.42 and 2.33 ± 0.85 μkat/L ($p=0.03$) in group A and B, respectively. There was significant correlation between peak CK-MB and the volume of ethanol injected ($r=0.45$, 95% CI 0.16 to 0.67; $p=0.004$). In both groups of patients, there was significant decrease in symptoms ($p<0.001$), left ventricular (LV) outflow gradient ($p<0.001$), septum thickness ($p<0.001$), and LV ejection fraction ($p<0.05$) at 3-month follow-up. In addition, LV diameter dilated slightly in both groups ($p<0.05$). There was no significant difference with regard to symptoms and most echocardiographic findings between both groups. No patient died.

Conclusion
The low-dose of alcohol was both clinically and hemodynamically effective and safe in the treatment of highly symptomatic HOCM patients without an extreme septum hypertrophy (<31 mm).

Study was supported by grant of Ministry of Health of the Czech Republic Nr 00064203.

Tuesday, October 27, 2009

14.50 **Arrhythmic Disorders in Anorexia Nervosa:** Malka Yahalom, MD, DSc, FICA[1,5], *Co-Chairperson, Membership Committee, International College of Angiology; Editor, International Journal of Angiology;* Ludamila Sendler[2], Marcelo Spitz[2], Noif Heno[3], Lea Even[3,5], Rima Feldman[4], Nathan Roguin, MD[1,5], Shaul Atar[1,5], *Departments of Cardiology[1], Children and Psychiatry[2], Pediatrics[3], and Internal Medicine C[4], Western Galilee Hospital, Nahariya, Israel; [5]Rappaport School of Medicine, Technion, Haifa, Israel.*

Introduction
Anorexia Nervosa (AN) is a life-threatening condition, with a significant risk for death, due to cardiac complications. It is characterized by abnormal eating behavior with the prevalence of 0.5% to 1.0%. AN affects predominantly adolescent girls, has the highest mortality rate of all psychiatric disorders, and has been associated with bradycardia, hypotension, mitral valve prolapse, and heart failure.

The diagnosis of AN can be elusive and more than one half of all cases are undetected.

Purpose
The purpose of this study was to evaluate cardiac findings in AN.

Patients and Methods
Twenty-three patients (20 females) with AN were examined in the last 3 years, including ECG, echocardiogram and Holter monitoring. The mean age was 16 years (range 11.5-20), weight loss 13.5 kg (range 6-26), and BMI 15.4 (range 10.9-20). Mitral valve prolapse (MVP) was found in 3, mitral regurgitation (MR) in 4, and mild aortic stenosis in one. Ten young adults without AN (8 females and 2 males, mean age 15 years), served as a control group.

Results
All patients had bradycardia (mean 44/min, range 26-68/min) documented by ECG and Holter monitoring. Findings were sinus and nodal bradycardia, with no evidence of arrhythmias, or QT interval prolongation. No patient needed pacemaker therapy. In the control group the mean slow heart rate was 74/min (range 66-99/min).

Conclusions
Bradycardia, in young adults, especially females with weight loss, should raise the possible diagnosis of AN, so it can be treated early and promptly.

Tuesday, October 27, 2009

15.00 **Three-Dimensional Echocardiographic Speckle Tracking as a Basis for Accurate Quantification of Left Ventricular Volumes: Comparison with MRI:** Hans-Joachim Nesser, MD, Victor Mor-Avi, Willem Gorissen, Lynn Weinert, Regina Steringer-Mascherbauer, Johannes Niel, Lissa Sugeng, Roberto Lang, *Public Hospital Elisabethinen, Linz, Austria; Toshiba Medical Systems, Zoetermeer, Netherlands; and University of Chicago Medical Center, Chicago, Illinois.*

Purpose

Although the use of two-dimensional (2D) echocardiography speckle tracking (EST) to quantify left ventricular (LV) volume has been demonstrated, this methodology relies on geometric modeling and the assumption that speckles can be tracked from frame to frame, despite their out of plane motion. To circumvent these limitations, a three-dimensional (3D) speckle-tracking algorithm was recently developed. Our goal was to evaluate the accuracy of this new 3D technique side-by-side with the 2D EST using cardiac magnetic Resonance (CMR) as a reference

Materials and Methods:

Apical 2- and 4-chamber views (A2C, A4C) and real-time 3D datasets (Toshiba Artida 4D System) obtained in 45 patients with a wide range of LV size and function were analyzed to measure LV end-systolic and end-diastolic volumes (ESV, EDV) using 2D and 3D EST techniques. Short-axis CMR images (Siemens 1,5T scanner) were analyzed to obtain ESV and EDV reference values using method of disks approximation.

Results

While 2D EST correlated well with CMR, it underestimated LV volumes with relatively large biases and wide limits of agreement, with A2C derived measurements being worse than A4C values. The 3D EST measurements showed higher correlation with CMR, and importantly smaller biases and narrower limits of agreement.

Conclusion

This is the first study to validate the new 3D EST technique for LV volume measurement and demonstrate its superior accuracy over previously used 2D EST technique.

Tuesday, October 27, 2009

15.30 **Mitral Leaflet Extension Plasty to Treat Regurgitation Due to Inferior Wall Infarction:** Choi-Keung Ng, MD, FICA[1], *Vice President, International College of Angiology; Co-Chairman, Scientific Committee, International College of Angiology;* Christia Schwarz, MD[1], Hans-Joachim Nesser, MD[2], Christian Puzengruber, MD[3], Peter Benedikt, MD[1], Herbert Franke, MD[1], Peter Hartl, MD[1]; *Departments of Cardiac Surgery[1] and Cardiology[3], General Hospital Wels, Wels, Austria; [2]Public Hospital Elisabethinen, Linz, Austria.*

Purpose
Mitral valve replacement as opposed to repair has been associated with higher mortality. Repair with ring annuloplasty alone has not been found to eliminate ischemic mitral regurgitation in all patients. Is leaflet extension plasty safe to treat patients who had severe mitral regurgitation (MR) after inferior wall myocardial infarction?

Patients
Between 1998-2007, the restricted posterior mitral leaflet motion of 27 patients with severe MR were observed with asymmetric geometry of the mitral leaflets after a transmural posteromedial myocardial infarction. The infarcted papillary muscle does not contract with progressive dilatation of left ventricle. The apical pull of papillary muscles at the end systole is unbalanced. These deformations tend to produce restriction of leaflet motion leading to less leaflet coaptation. The disorganization of the papillary muscle with annular dilatation distorts leaflet coaptation sufficiently to produce severe MR.

Materials and Methods
To secure valve repair, leaflet extension plasty with pre-treated autologous pericardium to enlarge the posterior leaflet surface area was performed for readjustment of the leaflet excursion, and restore the papillary muscle–annular relationship. This method enables to enlarge the posterior leaflet surface area over 100%. The leaflet edges are brought closer together, thereby allowing coaptation to occur more readily. This new strategy, in addition to utilizing an annuloplasty ring to reduce the annulus dilatation, successfully eliminated severe ischemic MR in patients with restrictive leaflet motion.

Results
No hospital deaths occurred in this series. Echo MR was absent or trivial in all patients at mid-term follow-up. There were 3 late deaths, 20 patients were in NYHA Class I, and 4 in Class-II. There have been no thromboembolic events and 80% of the patients require no permanent anticoagulation.

Conclusions
This simple technique with good results is efficacious likely to have readjusted the muscle-annular relationship of a geometrically deformed mitral valve after acute or chronic myocardial ischemia. This achieves durable repair of valves that might otherwise need to be replaced, and expend to interest with earlier operation intervention.

Tuesday, October 27, 2009

15.40 **How to Improve Cardiac Prevention and Rehabilitation: Secondary Prevention Through Cardiac Rehabilitation (CR), Today and in the Future:** Andrea Gyöngy, MSc, FICA, *Director of the Institute of Cardiovascular Prevention and Rehabilitation, Locarno, Switzerland.*

Objectives
Despite the known benefits of CR and despite the widespread endorsement of its use, CR is vastly underutilized. Reasons for this gap in CR participation are numerous, but the most critical and potentially most correctable reason revolves around obstacles in the initial referral of patients to CR programs. The aim of our study was to find out how to improve patient's enrollment in cardiac rehabilitation programs.

Methods
We studied the Euroaspire Survey I-III, the recommendations of the position paper of the working group on cardiac rehabilitation and exercise physiology of the European society of cardiology, and the statements of the AACVPR, ACC, AHA, in regarding to the new standards and the performance measures on cardiac rehabilitation. Recommendations and statements for referral to and delivery of cardiac rehabilitation, also called secondary prevention program. As direct observation, we collected data from 480 patients of our institute. The data collection was based on a review of the patients in the last 5 years.

Results
The actual studies show that cardiac rehabilitation programs help improve health, reduce the risk of death after cardiac illness by 20-25 percent. They also boost physical strength that could determine whether a patient is able to return to an active life. Performance measures ensure the safety and excellence of CR programs, documented patients progress and program performance. There is a need for knowledge about the proven benefits through CR for healthcare providers to ensure the participation of all eligible patients to a CR program.

Conclusions
The better the knowledge about the CR program and the comprehension of the physiological mechanisms, the greater will be the referral to them. "Referral to cardiac rehabilitation could soon be as automatic, as giving aspirin during a heart attack!" (AACVPR, ACC, AHA, 2007).

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15.50 **Outcome Data of STEMI-Networks in Austria—Comparison of City and Rural Areas:** Otmar Pachinger, MD, A. Halber, MD, J. Dörler, MD, A. Süßenbacher, MD, M. Wanitschek, MD, *Department of Cardiology, Medical University of Innsbruck, Innsbruck, Austria.*

Purpose
For the past five years a STEMI-network was established in many regions of Austria in order to improve the results in the treatment of acute myocardial infarction. The purpose of this study was to evaluate the parameters which influenced the efficiency of such networks.

Materials and Methods
In the past five years in Tyrol–a mountain area of Austria–the University of Innsbruck has established a network with all surrounding community hospitals to perform p-PCI in STEMI; time to presentation of symptoms, the transportation time and the door-to-balloon time were evaluated and have consistently improved over time. Transportation by helicopter resulted in a significant shorter time interval from symptom-onset to revascularization.

Results
During the last two years the-door-to-balloon time was significantly reduced, which translated into significant mortality reduction of patients suffering an acute myocardial infarction (30 day mortality below 5%). Loading dose of clopidogrel in conjunction with the other antithrombotic regimens contributed to improved outcomes.

Conclusion
Establishment of a regional network can improve in both – cities and rural areas – the outcome of patients with acute myocardial infarction. The time delays, transportation modality, type of intervention, and type of antithrombotic therapy are the most important determinants.

Tuesday, October 27, 2009

16.00 **Soluble Receptors for Advance Glycation End Products (sRAGE) and Non-ST Segment Elevation Myocardial Infarction (NSTEMI):** Kailash Prasad, MBBS (Hons), MD, PhD, FRCPC, FACC, FICA, FIACS, *Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, International Journal of Angiology;* Erick D McNair, MSc, AFICA; Calvin R Wells MD, FACC; Mabood Qureshi, MSc, AFICA; Rashpal S Basran, MD, FRCPC, FACC; Colin Pearce, MD, FRCPC; Jacobus S DeVilliers, MD, FRCPC; Jason Orvald, MD, FRCPC; *Departments of Physiology, Pathology and Cardiology, College of Medicine, University of Saskatchewan and Royal University Hospital, Saskatoon, Saskatchewan, Canada.*

Purpose

Interaction of the receptor for advanced glycation end products (RAGE) with AGEs results in increased expression of inflammatory mediators, including tumor necrosis factor-alpha (TNF-α), interleukins and soluble vascular adhesion cell molecule-1 (sVCAM-1), activation of nuclear factor kappa-B (NF-κB) and induction of oxidative stress. All the above factors have been implicated in the development of atherosclerosis. sRAGE acts as a decoy for AGEs and thus prevents the deleterious effects of the RAGE and AGEs interaction. Since the combination of AGEs, RAGE and sRAGE play a role in vascular complications; measurements of these factors should be considered. It is hypothesized that patients with NSTEMI have lower levels of serum sRAGE and/or higher levels of AGEs/sRAGE compared to healthy control subjects. The main objectives were to investigate if i) levels of serum sRAGE are lower and levels of AGEs/sRAGE, TNF-α and sVCAM-1 are higher in NSTEMI patients compared to healthy controls; and if ii) sRAGE or AGEs/sRAGE is a biomarker/predictor of NSTEMI.

Materials and Methods

Serum levels of sRAGE, AGE, TNF-α and sVCAM-1 were measured using commercially available ELISA kits in 46 NSTEMI patients and 28 control subjects. Coronary angiograms were performed to assess coronary lesions.

Results

The levels of serum sRAGE were lower and those of AGE, TNF-α and sVCAM-1 was higher in NSTEMI patients compared to controls. sRAGE levels were negatively correlated with the number of diseased vessels and serum levels of AGE, AGE/sRAGE, and TNF-α and sVCAM-1. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of sRAGE as a biomarker/predictor were 59%, 100%, 100%, 100% and 74%, while those for the AGE/sRAGE test were 85%, 91%, 97%, 67% and 86%, respectively.

Conclusions

I) Both serum levels of sRAGE and AGE/sRAGE may be used as biomarkers/predictors of NSTEMI; II) sRAGE is negatively correlated with the number of diseased vessels, sVCAM-1, TNF-α and AGE/sRAGE.

Tuesday, October 27, 2009

16.10 **PCI-Intervention in Multivessel Disease: What Matters More—Anatomy or Function?** Otmar Pachinger, MD, *Department of Cardiology, Medical University of Innsbruck, Innsbruck, Austria.*

Purpose

The proper selection of patients for PCI for coronary lesions of different hemodynamic severity is difficult in multi-vessel disease (MVD). Angiography alone had major limitations especially in MVD.

Should we use testing for functional significance in the daily practise more frequently? Fractional flow reserve has provided excellent data for the guidance of elective interventions in MVD patients.

The recently published FAME-study has confirmed that angiographically driven interventions are inferior to functionally driven decisions.

Last year in our Institution we performed 1500 coronary interventions, and in 30% of these interventions, the angiographic severity of the lesion was questionable.

The addition of functional flow reserve could provide further information in more than 30% of these patients, so implantation of a stent in an angiographic borderline lesion could be avoided.

Conclusion

In MVD, angiographic determination of the lesion severity has major limitations which can be overcome by additional functional testing, such as fractional flow reserve, especially in moderate lesions with an angiographic severity of 50-70%.

Tuesday, October 27, 2009

16.30 h. – 17.45 h.

Sixteenth Scientific Session

Endovascular Repair of Arterial Aneurysms
Scientific Poster Presentations

Moderator:

Kailash Prasad, MBBS(Hons), MD, PhD, FRCPC, FACC, FICA, FIACS

Professor Emeritus of Physiology, College of Medicine; Member, Board of Directors, International College of Angiology; Chairman, Scientific Committee, International College of Angiology; Senior Editor, *International Journal of Angiology;* Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

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16.30 **Delayed Treatment of a Traumatic Right Subclavian Artery Pseudoaneurysm:**

Randall W. Franz, MD, FACS, RVT, FICA, *Vice President, International College of Angiology; Editor, International Journal of Angiology; The Vascular and Vein Center at Grant Medical Center, Columbus, Ohio.*

Abstract

A 22-year-old man sustained 4 gunshot wounds to the upper torso resulting in left pneumothorax, an expanding right neck hematoma, left humerus fracture, a traumatic arteriovenous fistula from the right subclavian artery to the right brachiocephalic vein, and pseudoaneurysm formation from partial transection of the right subclavian artery. The patient underwent emergent repair of the confluence of the right internal jugular, subclavian and brachiocephalic veins, and laparotomy secondary to compartment syndrome. Seven weeks later, with the pseudoaneurysm enlarged to 6 cm. It was repaired with combined access via the right common femoral artery and right brachial artery. The pseudoaneurysm was covered with a 7 mm x 8 cm fluency-covered stent graft, and post-dilated with a 7 mm x 4 cm balloon. Post-operatively, the patient had palpable pulses, occlusion of the pseudoaneurysm, and excellent blood flow into the arm.

Background

Cases of delayed subclavian pseudoaneurysm can result in disability, such as incomplete sensory nerve recovery and loss of motor function of the ipsilateral upper extremity. Pseudoaneurysms caused by trauma can remain symptomatic for years or can cause symptoms after days or weeks.

Symptoms occur as the pseudoaneurysm increases in size. Symptoms include neurological complications and ischemia in the upper extremity. Other symptoms include dysphagia, dysphonia, dyspnea, and Horner syndrome, an expanding and pulsatile mass, and weakness and paresthesias of the ipsilateral upper extremity. Rupture of the pseudoaneurysm is by far the most serious and life-threatening complication. Pseudoaneurysms are diagnosed optimally by CT scan, or arterial duplex, which can determine the size.

Case Details

- 4 wounds; 2 in right shoulder, 1 left shoulder, 1 left chest
- CT angiogram of chest revealed traumatic arteriovenous fistula from right subclavian artery to right brachiocephalic vein (confirmed by angiography)
- Immediate repair of confluence via sternotomy with partial trap door incision and transection of right clavicle
- Emergency laparotomy secondary to compartment syndrome
- Massive Transfusion Protocol activated
- Patient admitted to intensive care

Patient Course

Post-trauma Day 26

- Arterial Duplex reveals persistent pseudoaneurysm of right subclavian artery, enlarged to 5cm

Post-trauma Day 32

- Pseudoaneurysm expanded to 6cm

Post-trauma Day 34

- Pseudoaneurysm repair via combined access through the right common femoral artery with an 8-French sheath and through the right brachial artery with a 4-French sheath, in which the wire was able to be snared from the arm into the right groin, thus allowing access to the pseudoaneurysm
- Covered with 7mm by 8cm fluency covered stent
- Post-dilated with 7mm by 4cm balloon

- Repeat angiogram revealed occlusion of subclavian pseudoaneurysm with excellent circulation into the arm and palpable pulses

Post-trauma Day 41

- Patient discharged

Discussion

Traumatic vascular injuries can sometimes be repaired with endovascular techniques.

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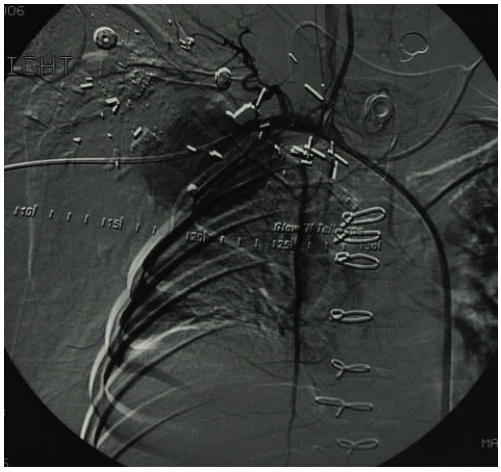

Figure 1. Right subclavian pseudoaneurysm

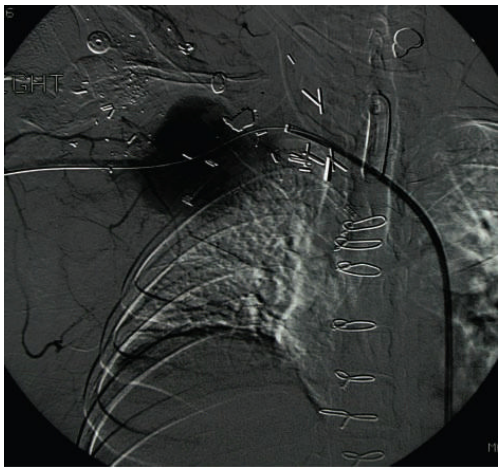

Figure 2. Right subclavian artery pseudoaneurysm with patency of the distal right subclavian artery

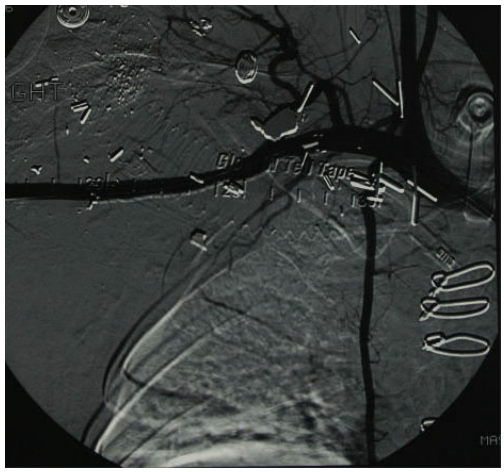

Figure 3. Completed procedure

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16.35 **Staged Endovascular Repair of Bilateral Internal Iliac Artery Aneurysms:** Randall W. Franz, MD, FACS, RVT, FICA, *Vice President, International College of Angiology; Editor, International Journal of Angiology; The Vascular and Vein Center at Grant Medical Center, Columbus, Ohio.*

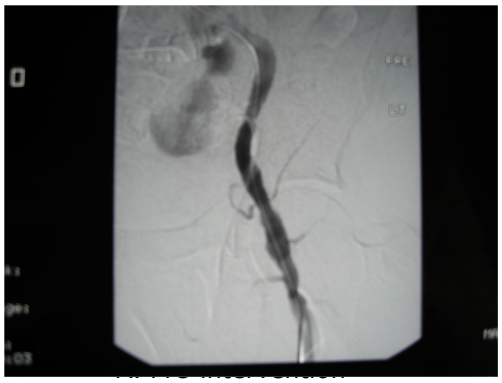
Abstract

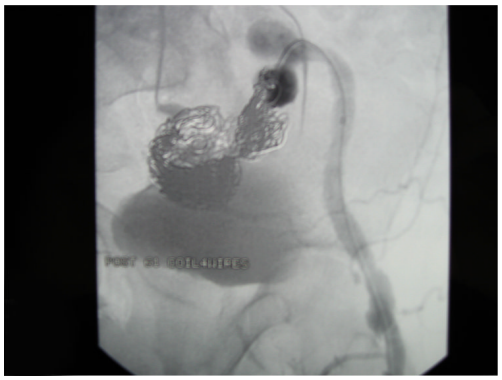
- Internal iliac artery (IIA) aneurysms present several challenges to the vascular surgeon:
  - Uncommon
  - Difficult repair associated with relatively high morbidity / mortality
  - Risk of rupture 14-70%
  - Bilateral IIA disease adds ischemic complications
- This case:
  - 76 Year old male
  - Bilateral IIA aneurysms
  - Staged endovascular coli embolization
  - Exclusion of flow to aneurysms and avoidance of ischemic post-operative complications
  - Complete bilateral occlusion at 6 weeks & 1 yr post

Case Report

- Presented to primary care physician c/o nonspecific pain across lower abdomen
- History of HTN, COPD, hypercholesterolemia, CAD
- Smoker-40 pack-year
- CT revealed bilateral IIA aneurysms (3.9cm left, 3.0 cm right), and 3.4cm AAA
- Vitals, physical, and ABI's within normal limits
- Palpable pulses bilaterally (femoral, popliteal, dorsalis pedis and posterior tibial)
- Scheduled for elective staged endovascular coil embolization with one month between procedures

Angiogram at the time of intervention on the Left IIA





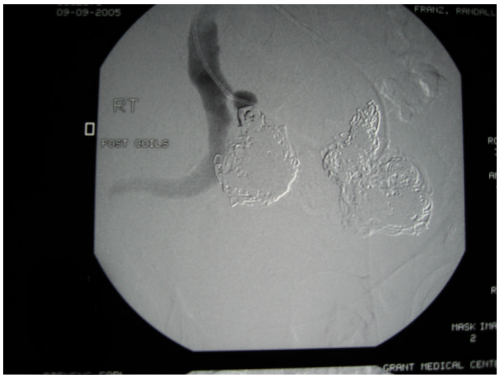
B. During Intervention

Follow-Up

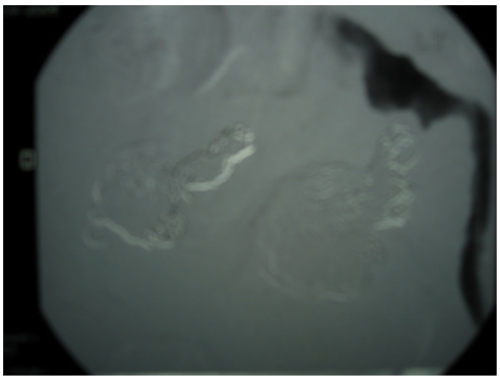
- 2 weeks Post-op:
  - No buttock or thigh claudication
- CT at 6 weeks:
  - Occlusion of both IIAs
- 1 Year Post-op:
  - Decreased aneurysm size: 3 to 2.2cm on right, 3.9 to 2.8cm on left

Discussion

- Iliac artery aneurysms commonly found in AAA patients
- Isolated IIA only 0.4-2% of intra-abdominal aneurysms
- Complication could include buttock claudication/necrosis, bowel ischemia, impotence, or lower extremity neurologic deficits
- This procedure was elective and staged to minimize the risk of complication
- Successful example of repair of bilateral internal iliac artery aneurysms using an endovascular technique



C. Post-intervention



D. Post-intervention of Right IIA

Tuesday, October 27, 2009

16.40 **Delayed Pseudoaneurysm Repair: A Case Report:** Randall W. Franz, MD, FACS, RVT, FICA, *Vice President, International College of Angiology; Editor, International Journal of Angiology;* Christi Hughart, DO; *The Vascular and Vein Center at Grant Medical Center, Columbus, Ohio.*

Abstract

- Iatrogenic pseudoaneurysms are a complication of arterial catheterization (diagnostic and/or interventional)
- Approximate Incidence:
  - 1% following diagnostic cath
  - 3.2% following interventional procedures
  - Symptoms of pain and swelling at insertion site
  - Current preferred treatment is ultrasound guided thrombin injection
  - Most research details treatment soon after catheterization
- This case:
  - 61 Year Old Female
  - 2 Years S/P cardiac catheterization

Case Report

- Complaint of left groin and left lower quadrant abdominal pain
- History of CAD, OA, COPD, HTN, hypercholesterolemia
- First noted swelling after procedure
- Progressive enlargement over 2 years
- Physical exam-bruit in left groin with palpable non-pulsatile mass
- 4.6cm x 5.5cm of left common femoral artery with 3.2cm x 3.8cm lumen visualized by non-contrast computed tomography
- U/S confirmation with neck measurement of 0.67cm
- U/S guided injection with 4mL of bovine thrombin followed by 2 hours of bed rest

Figure 1. Ultrasound image of pesudoaneurysm of the left common femoral artery

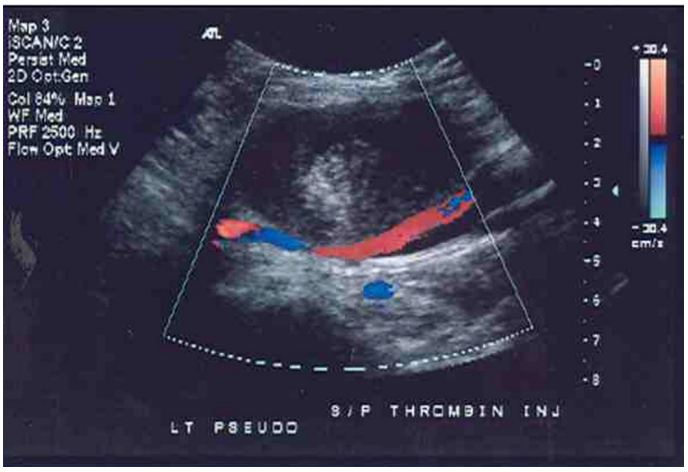


Figure 2. Post-procedure ultrasound showing complete resolution of the pseudoaneurysm, as well as patent artery

Discussion

- Common femoral artery most common site for iatrogenic pseudoaneurysm
- Other contributing factors to formation:
  - Length and complexity of procedure
  - Use of anticoagulants
  - Early mobilization
- Symptoms include pain from pressure or nerve compression, or extremity swelling d/t venous compression
- Possible complications include DVT or rupture
- Current preferred treatment is injection of 0.5-1mL of thrombin with Doppler guidance (average 15 minutes) followed by bed rest 2-4 hours, limited mobilization and U/S
- Thrombin successful 94-100%-unresponsiveness necessitates open repair
- U/S guided compression is an alternative with 60% success rate

Conclusion

- Iatrogenic pseudoaneurysm relatively well-known entity
- Thrombin injection is simple & highly effective
- Time interval from cath. to treatment usually short, or not discussed in publications
- This case suggests thrombin injection treatment of iatrogenic pseudoaneurysm may be as effective in treating late-occurring as for short interval occurrences

Tuesday, October 27, 2009

16.45 **Treatment of Aorto-Duodenal Fistula Following Surgical Repair of an Abdominal Aortic Aneurysm: The Role of Endovascular Repair as a Bridge Therapy Prior to Definitive Treatment:** Masayuki Hara, MD, Koji Maeda, MD, Kenjiro Kaneko, MD, Hiroki Ohta, MD, FICA, Makoto Sumi, MD, FICA, Katsunori Tanaka, MD, Koji Kurosawa, MD, Shigeki Hirayama, MD, Hiromasa Tachihara, MD, Naoki Toya, MD, FICA, Yuji Kanaoka, MD, FICA, Atsushi Ishida, MD, FICA, Takao Ohki, MD, PhD, FICA, *Department of Surgery, Division of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.*

Purpose

Endovascular aneurysm repair (EVAR) has gained wide acceptance, but its use for the treatment of infectious sites including aorto-duodenal fistula and mycotic aneurysm is considered to be contraindicated. We report the utility of a stent graft as bridge therapy in a case of aorto-duodenal fistula that developed following open aneurysm repair.

Case Presentation

A 63-year-old man was admitted to our hospital in the state of shock due to gastrointestinal bleeding. He had undergone open repair of an abdominal aortic aneurysm (AAA) at the age of 52. Computed tomography revealed a pseudoaneurysm at the proximal anastomotic site. A diagnosis of aorto-duodenal fistula was made and emergent EVAR was first performed to control gastrointestinal bleeding. After the patient's general condition was stabilized, a definitive treatment consisting of an extra-anatomical bypass, resection of the infected graft, closure of the perforation of the duodenum, and debridement of the surrounding tissue was performed. His post-operative course was uneventful, and administration of oral antibiotics was continued for 6 months.

Conclusion

Treatment of an aorto-duodenal fistula following surgical aortic repair remains challenging.

16.50 **Endovascular Aneurysm Repair is Safe and Effective for Elderly Patients:** Hiroki Ohta, MD, FICA, Masayuki Hara, MD, Kenjiro Kaneko, MD, Koji Maeda, MD, Makoto Sumi, MD, FICA, Katsunori Tanaka, MD, Koji Kurosawa, MD, Shigeki Hirayama, MD, Hiromasa Tachihara, MD, Naoki Toya, MD, FICA, Yuji Kanaoka, MD, FICA, Atsushi Ishida, MD, FICA, Takao Ohki, MD, PhD, FICA, *Department of Surgery, Division of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.*

Purpose

Many elderly patients with abdominal aortic aneurysms (AAAs) are rejected to undergo conventional open repair because of their advanced age and co-morbidity, and often live in fear of an AAA rupture. Endovascular aortic aneurysm repair (EVAR) which does not require laparotomy, appears to be best suited for patients with advanced age that were traditionally left untreated. The aim of this study was to clarify the safety of EVAR for advanced age patients.

Materials and Methods

During the last two years, 255 patients with AAA were treated by EVAR with either the Cook Zenith or the Gore Excluder device at our institution. The patients were divided into two groups according to their ages. Group O included 91 patients who were 80 years old or over (80-96 years), while group Y included 164 patients under 80. We compared peri-operative factors including, LOS, operation time, blood loss, fluoroscope time, contrast volume, and post-operative status between the two groups.

Results

The pre-operative maximum AAA diameter was 60.9mm in group O and 57.4mm in group Y ($p<0.05$). There were no significant differences between the groups for operative time (174.8 min in group O vs 169.1 min in group Y), blood loss (432 ml vs 299 ml), fluoro time (38 min vs 36.5 min), and contrast volume (132.5 ml vs 140.5 ml). The hospital mortality rate was 0% in both groups. The rate of post-operative complications did not significantly differ between the groups. The length of post-operative hospitalization was significantly longer in group O (6.6 days) compared to group Y (5.3 days) ($p<0.05$). All patients in group O were able to go home and none required transfer to a nursing home.

Conclusion

EVAR can be performed safely in patients with advanced age. Patient's satisfaction is high since EVAR can relieve the patient's from fear of rupture and sudden death while maintaining their QOL owing to it's minimally invasiveness. We believe that advanced age should not be a reason to reject EVAR in those patients with a large AAA.

16.55 **The Efficacy of the TachoComb Surgical Collagen Patch in Reducing Hemostasis Time of the Femoral Arteriotomy Site during Endovascular Aneurysm Repair (EVAR): A Randomized Controlled Study:** Makoto Sumi, MD, FICA, Masayuki Hara, MD, Kenjiro Kaneko, MD, Koji Maeda, MD, Hiroki Ohta, MD, FICA, Katsunori Tanaka, MD, Koji Kurosawa, MD, Shigeki Hirayama, MD, Hiromasa Tachihara, MD, Naoki Toya, MD, FICA, Yuji Kanaoka, MD, FICA, Atsushi Ishida, MD, FICA, Takao Ohki, MD, PhD, FICA, *Department of Surgery, Division of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.*

Purpose

Prolonged bleeding from the femoral arteriotomy site may result in increased blood loss as well as longer operating time. In this study, we investigated whether the use of a surgical collagen patch with a dry layer of fibrinogen and thrombin (TachoComb, CSL, Behring), may reduce blood loss and the time to hemostasis during endovascular aneurysm repair (EVAR).

Materials and Methods

TachoComb consists of equine collagen in a sponge-like sheet coated on one side with human fibrinogen and bovine thrombin. We investigated the efficacy of TachoComb in obtaining hemostasis of the femoral arteriotomy site by randomizing 31 patients to routine TachoComb use group (n=15) versus control group (n=16). In both groups, the femoral arteriotomy site was closed with a 5-0 prolene suture.

Results

The time to complete hemostasis after closure of the femoral artery was significantly shorter in the TachoComb group compared to the control group (39±45 vs 166±136 sec, $p<0.01$). Furthermore, the TachoComb group resulted in significantly less blood loss following artery closure compared to the control group (1.9±1.7 vs 7.2±4.6 mL, $p<0.01$). However, there was no statistical difference in total operative time and blood loss probably due to the small sample size. In both groups, stenoses or pseudoaneurysms of the common femoral arteries were not observed by CT angiography at 1 and 6 months after surgery.

Conclusion

This randomized controlled study demonstrates the efficacy of the TachoComb at reducing the time to hemostasis of the common femoral arteriotomy during EVAR.

Tuesday, October 27, 2009

17.00 **Short- and Mid-Term Results of Endovascular Aneurysm Repair Utilizing the Zenith and Excluder Stent Grafts:** Naoki Toya, MD, FICA, Masayuki Hara, MD, Kenjiro Kaneko, MD, Koji Maeda, MD, Hiroki Ohta, MD, FICA, Makoto Sumi, MD, FICA, Katsunori Tanaka, MD, Koji Kurosawa, MD, Shigeki Hirayama, MD, Hiromasa Tachihara, MD, Yuji Kanaoka, MD, FICA, Atsushi Ishida, MD, FICA, Takao Ohki, MD, PhD, FICA, *Department of Surgery, Division of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.*

Purpose
The purpose of this study was to compare the outcome of endovascular aneurysm repair (EVAR) using the Zenith (Cook) and the Excluder (W. L. Gore & Associates) stent graft.

Materials and Methods
We performed a retrospective review of patients who underwent EVAR with the Zenith and the Excluder stent graft at Jikei University during the last three years. A total of 437 patients (204 patients with Zenith, 233 patients with Excluder) underwent elective EVAR. We reviewed 292 cases, excluding fenestrated and branched EVAR. When hypogastric coil embolization was needed, it was performed at the time of EVAR.

Results
Technical success was achieved in each case with no surgical mortality. Clinical success was similar (Zenith 99.5% vs. Excluder 99.6%). The operation time, blood loss, and amount of contrast used were Zenith 159 min vs. Excluder 167 min, Zenith 275ml vs. Excluder 341ml, and Zenith 131ml vs. Excluder 131ml, respectively. There were no statistical differences between the two groups. Two cases (one patient in Zenith, one patient in Excluder) underwent secondary endovascular repairs for the treatment of persistent type 1 endoleak with sac enlargement. In the Zenith group, ischemic colitis developed in four patients (2%) all of which were successfully treated with bowel rest and hydration, and stroke in one patient. Endograft limb occlusion was encountered in five patients (2.5%), four of which were treated with femoro-femoral bypass. These complications occurred in patients with tortuous anatomy. No patient in the Excluder group suffered from ischemic colitis, stroke, or limb occlusion. During the follow up period, two patients (one patient in Zenith, one patient in Excluder) died of cholesterol crystal embolization.

Conclusion
The short- and mid-term data support mid-term durability of the Zenith and the Excluder grafts. Although both the Excluder and the Zenith have its unique strengths and weaknesses, the Excluder may be the device of choice for cases with tortuous anatomy while the Zenith may allow treatment of short proximal neck owing to the supra-renal stent.

Tuesday, October 27, 2009

17.05 **Therapeutic Strategies for Visceral Artery Aneurysms:** Koji Kurosawa, MD, Masayuki Hara, MD, Kenjiro Kaneko, MD, Koji Maeda, MD, Hiroki Ohta, MD, FICA, Makoto Sumi, MD, FICA, Katsunori Tanaka, MD, Shigeki Hirayama, MD, Hiromasa Tachihara, MD, Naoki Toya, MD, FICA, Yuji Kanaoka, MD, FICA, Atsushi Ishida, MD, FICA, Takao Ohki, MD, PhD, FICA, *Department of Surgery, Division of Vascular Surgery, Jikei University School of Medicine, Tokyo, Japan.*

Background
Visceral artery aneurysms (VAAs) are uncommon, but they are clinically important because of the risk of rupture and distal embolization. The incidences of asymptomatic VAAs, which are often detected by CT and MRI, have been increasing due to the advancement of the imaging modalities. We describe our strategy for the treatment of VAAs including both endovascular therapy (EVT) and open surgery (OS).

Materials and Methods
From June 2006 to April 2009, 25 patients with visceral aneurysm, including 5 celiac and common hepatic artery aneurysm (CAA and CHAA) cases, 2 superior mesenteric artery aneurysm (SMAA) cases, 9 splenic artery aneurysm (SAA) cases, 7 renal artery aneurysm (RAA) cases, and 2 gastroduodenal artery aneurysm (GDAA) cases, were treated at our Institution.

Results
The ages ranged from 30 to 80 years. Of 5 patients with CAA and CHAA, 1 underwent OS, 4 underwent EVT. Both patients with SMAA underwent OS. All 9 patients with SAA underwent EVT. Of the 7 patients with RAA, OS was performed in 2 and EVT in 5. Both patients with GDAA underwent EVT. Urgent intervention was required in both cases with GDAA, and 1 case with SAAA, because they were either symptomatic or ruptured. Technical success was achieved in all cases with no major morbidity and mortality.

The choice of treatment was determined by either the necessity of preserving the parent vessel, shape of the aneurysm, existence of indispensable branches arising from the aneurysm, and patient's overall condition. Preserving the parent vessel is important for the treatment of RAA and SMAA, but is usually not for CA and CHAA. Therefore, OS was performed for most RAA and SMAA, while the majority of CAA, CHAA, and SAA were mostly treated by EVT.

Conclusion
Our strategy for the treatment of VAA appears to be acceptable. Vascular surgeons should be proficient in both treatments in order to provide the appropriate procedure for VAAs.

Tuesday, October 27, 2009

17.10 **Experimental Study of a New Modular Branched Stent Graft to Reconstruct the Aortic Arch:** Wei Guo, MD, Jia Xin, MD, Daihua Yang, MD, Xiaoping Liu, MD, Yin Tai, MD, Hong-peng Zhang, MD, Faqi Liang, MD, Guo-hua Zhang, MD, *Department of Vascular Surgery, General Hospital of PLA, Beijing, China.*

Background

Endovascular aortic repair by stent graft has been developed as a safe and less invasive treatment for descending thoracic and abdominal aortic diseases. In case of involvement of the aortic arch, the challenge in endovascular repair, as in surgical repair, is to maintain blood flow to the brain and upper extremities during operation. Several studies have been done on how to repair this difficult part of aorta by endovascular and hybrid techniques for one or more branch arteries. However, if the lessons involve all of the super aortic arch vessels, single endovascular repair still presents in a huge challenge. We have developed a new modular stent graft to reconstruct the aortic arch without surgical bypass. To test the feasibility of this device, we first performed the procedure on canine models.

Material and Methods

The new modular stent graft was composed of three components. Part I and Part II are both bifurcated, with one long narrow limb supplying blood to brain, and one short wide limb in the aorta trunk. Part III is a taper tubular component and extends into the descending thoracic aorta. To manufacture suitable stent grafts for canine model, aortography was performed on two adult dogs, and the data of the target vessels were measured. All of the dogs underwent general anesthesia. Part I was delivered from the right subclavian and inserted the main body of the ascending thoracic aorta, long limb in the innominate artery, and short limb in the aortic channel. Part II was delivered from the left subclavian artery, connected and overlapped the main body with Part I short limb, keeping the Part II short limb in aortic arch. Part III was delivered from the femoral artery, and connected with Part II short limb, leaving the distal tubular stent graft in the descending thoracic aorta. The three parts of the modular device were combined in the aortic arch to realize the reconstruction of the super aortic arch branch vessels.

Results

Ten adult dogs were operated with the procedure using new the stent graft. Eight were successfully implanted the device. The technical success rate was 80% (8/10). The average operation time was 320min (270-400min), and the average blood loss was 75ml (30-350ml) per dog. Five dogs survived and lived for two weeks without obvious cerebral, visceral or limb ischemia. CT scan showed the implanted stent graft was patent, and the vital side branches of the aortic arch were well preserved.

Conclusions

Our study indicated that the new modular branched stent grafts could be an alternative endovascular method to reconstruct the aortic arch, particularly, with three branch artery involvement. This strategy could avoid a complex surgical procedure. However, the durability in humans must still be researched.

Tuesday, October 27, 2009

17.15 **Endovascular Repair of Acute Stanford Type B Aortic Dissection Combined with Mass of Hydrothorax:** Shu Chang, MD, Quanming Li, MD, Ming Li, MD, Hao He, MD, Mingyao Luo, MD, Xin Li, MD, *Vascular Department of the 2nd Xiuang-ya Hospital, Central-South University, Changsha, China.*

Objective
The objective of this study was to explore the endoluminal management for type B aortic dissection combined with mass of hydrothorax.

Methods
The clinical data of 27 patients hospitalized from January 2003 to December 2008 were analyzed retrospectively. During the study period, 27 patients with Stanford type B acute aortic dissections were managed by endoluminal repairs in the acute phase, since a great quantity of hydrothorax had been found by CT or chest fluoroscopy. There were 23 men and 4 women. The average age was 45.2 ± 6.3 years (35-70). Eleven patients had hydrothorax in both thoraxes (40.7%), while 13 in the left (48.1%), and 3 in the right (11.1%) only, and 2 combined with pericardial effusion (7.4%). SaO_2 of all were below 90%.

Results
All 27 operations were technically successful, with no deaths in the peri-operative period. Hydrothorax disappeared 28 days to 3 months after operation in all patients. Five cases had puncture drainage (18.5%) and 1 case had tube drainage (3.7%). Mean follow-up was 26.5 ±3.9 months (6-58m) after endovascular management. Complications including pleural thickening (6 of 27, 22.2%), pulmonary atelectasis (2 of 27, 7.4%), and lung consolidation combined with chest dent (2 of 27, 7.4%).

Conclusions
Endovascular therapy is safe and effective for cases of acute Stanford type B aortic dissection with hydrothorax. Early treatment is very important to the patient with dissection combined with hydrothorax. Reasonable drainage of hydrothorax after stent graft deployment is a must for the patient suffering from respiratory failure.

Tuesday, October 27, 2009

17.20 **Endovascular Stent Graft Treatment for Stanford Type A Aortic Dissection:** Shen-ming Wang, MD, Guang-qi Chang, MD, Xiao-xi, Li, MD, *Department of Vascular Surgery, First Hospital of Zhong Shan University, Guangzhou, China.*

Aim
The goal of this study is to summarize the experience of endovascular stent grafting for Stanford type A aortic dissection.

Methods
We analyzed the clinical information of 45 cases of Stanford type A aortic dissection treated with endovascular stent grafting period from January 2001 to January 2009. There were 41 males and 4 females. Ten cases were DeBakey I with a tear located at the ascending aorta, 2 cases had simultaneous arch vessel bypass. Fourteen cases were Stanford type A aortic dissection with tears at aortic arch, 12 cases had one phase or two phase arch vessel bypass, and 2 cases had subclavian artery revascularization. Twenty-one cases were type B aortic dissection with a tear at the distal aortic arch or proximal descending aorta, and 4 cases had left subclavian artery (LSA) revascularization.

Results
The surgical success rate was 97.8% (44/45), and mortality rate was 6.7% (3/45). Ten cases had Type I endoleak following the endovascular aortic dissection repair. One patient died during the operation, 4 cases were successfully treated with balloon expandable stents, 4 cases were sealed with aortic cuffs, and one case with LSA flow reflux was sealed by occluder. The average follow-up time was 25.5 ± 3.8 months (4-108 months), and follow-up rate was 95.6% (43/45). Up to the most recent review or death, there were a total of 32 complete thromboses, and 10 partial thromboses formed inside the false lumen. Three deaths occurred during the follow-up. The total mortality rate was 11.6% (5/43).

Conclusion
Endovascular stent graft treatment was a minimally invasive, safe, and effective method to treat Stanford type A aortic dissection. When necessary, it can combined with arch vessel bypass to achieve sufficient anchoring area for cases involving the aortic arch to guarantee blood supply to the head and neck.

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17.25 **Comparison of Endovascular Repair vs. Open Surgical Repair for Abdominal Aortic Aneurysms:** Shi-jie Xin, MD, Wen-liang Yue, MD, Jian Zhang, MD, Hai-di Hu, MD, Xin-hua Hu, MD, Zhi-quan Duan, MD, *Department of General Surgery, Division of Vascular and Thyroid Surgery, First China Medical University, Shen Yang, China.*

Purpose
The purpose of this study was to compare the similarities and differences between endovascular repair (EVAR) and open surgical repair (OSR) for abdominal aortic aneurysm.

Methods
Ninety-two patients with abdominal aortic aneurysms (AAA) were selected from 2004 to 2008. Among them, 54 patients were treated with EVAR, and 38 patients with OSR. The data from the two groups was collected and analyzed.

Results
Compared to OSR group, the mean blood lost, blood transfusion, and intra-operative fluid in the EVAR group was significantly less, ($p<0.05$). The mean time of operation, observation period in ICU, and hospitalization in the EVAR group was shorter than OSR group ($p<0.05$). However, the cost of hospitalization in the EVAR was far higher than that of the OSR group ($p<0.05$). The short-term post-operative complications of the OSR group was higher than the EVAR ($p<0.05$). However, there was no statistical significant difference in the death rate of the two groups during the phase around operation ($p>0.05$).

Conclusions
EVAR has the advantages of mild trauma, less blood loss, quicker recovery post-operatively, and less disturbance to internal environment. EVAR is particularly suitable for patients who can not undergo open surgical repair. The cost of EVAR still remains higher that that for open repair.

Tuesday, October 27, 2009

17.30 **Clinical Experience of Endovascular Aortic Repair for Aortic Aneurysms:** Peng Liu, MD, Zhidong Ye, MD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China.*

Objective
The objective of this study was to evaluate the method and clinical effect of endovascular aortic repair (EVAR) for aortic aneurysms. Indication for EVAR will be discussed.

Methods
From March 2003 to March 2009, 95 cases with aortic aneurysms were treated by EVAR, 42 cases were dissected aortic aneurysms (Stanford Type B), 38 cases were infra-renal abdominal aortic aneurysms (AAA), 10 cases were thoracic aortic aneurysms (TAA), and 5 cases were aortic pseudoaneurysms.

Results
EVAR was successfully performed in all cases. False lumen in 42 cases of aortic dissection disappeared after stent deployment, 10 cases of TAA, 5 cases of pseudoaneurysms, and 38 cases of infra-renal AAA were successfully isolated. Follow-up period ranged from 6 to 36 months, 1 case died 2 months after EVAR. Type II endoleak was found in 2 cases, and 1 stent graft migration was found.

Conclusions
EVAR is effective, less traumatic, and safe when the indications are carefully selected. It may serve as an alternative treatment for most aortic aneurysms. However, patients should be monitored for endoleaks during follow-up. Long-term results need further study.

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17.35 **Endovascular Treatment for Iliac Stenosis:** Peng Liu, MD, Zhidong Ye, MD, Fei Wang, MD, *Department of Cardiovascular Surgery, China-Japan Friendship Hospital, Beijing, China.*

Objective
The objective of this study was to review our early experience of iliac angioplasty with stenting, and to evaluate the safety, short-term patency, and clinical success rates in patients with iliac artery stenosis disease.

Methods
From August 2005 to September 2007, 18 iliac lesions (all stenotic) in 15 patients were treated by percutaneous transluminal angioplasty (PTA) and stenting. The patients had chronic limb ischemia described as disabling claudication (the Society for Vascular Surgery clinical category 2 or 3) in 9 cases, rest pain (category 4) in 5 cases, and ulcer/gangrene (category 5) in 1 case. Six limbs were treated with concomitant open procedures. The affected arteries treated were 7 in the common iliac, 5 in the external iliac, and 3 in both arteries. According to the TransAtlantic Inter-Society Consensus (TASC) classification, 7 limbs were type A, 5 type B, 3 type C, and 0 type D.

Results
There were no peri-operative deaths. The mean follow-up was 15 months (median 10; range 1 to 24 months). The technical success rate was 94.4%. Overall, the cumulative primary patency rate at 1 year was 94.4%.

Conclusions
Endovascular treatment is a safe, feasible, and a minimally invasive procedure with a high technical success rate, low complication rate, and high short-term patency rate, which may be used as an alternative to bypass for chronic limb ischemia.

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