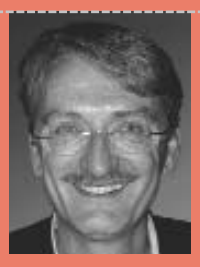
IR congress news



Johannes Lammer
CIRSE President

Dear Colleagues,

As you all know I will lay down my official responsibilities as CIRSE president after the elections at today's General Assembly. The last two years have certainly been an exciting and inspiring time and I would like to thank all of you for entrusting me with the responsibility of leading our society in these years, but most of all I would like to thank you for the dedication and competence you have brought to the CIRSE projects and activities.

The decisions made by CIRSE and its members' dedication to the promotion of Interventional Radiology are more important than ever, as this truly is a crucial moment for our discipline. It has always been my belief that in order to achieve our goals we must focus on training and further education, as only extremely competent IRs will be able to defend our specialty against the encroachments from other disciplines. This is the reason why during my presidency I focused on expanding CIRSE's initiatives towards training and education.

CIRSE 2007 - Athens
Monday, September 10, 2007

CIRSE Foundation Party

Take part in CIRSE's biggest social event!

Tuesday, September 11, 2007

The CIRSE Foundation Party is doubtlessly CIRSE's most popular social event. This is why CIRSE will kick it up a notch in 2007, adding even more performances and surprises to this fun and exciting evening. The exquisite dinner followed by a spectacular show will give you the opportunity to support the Foundation's activities while networking with interventionists from around the globe.

To purchase tickets or pick up previously booked tickets, please go to the Hotels, Tours & Social Events Counter in the registration area.

The educational programme of our annual CIRSE Meeting was also expanded and structured in modules, namely vascular and non-vascular IR, embolotherapy, oncology and clinical practice developement. Another novelty at CIRSE 2007 will be the IR Foundation Courses. I will be happy to continue the expansion of our educational programme as Chairman of the CIRSE Foundation Advisory Council.

The ESIR courses, first introduced in 2006 and extended in 2007, have been a tremendous success, showing us the importance of training and further education accessible to everyone and adapted to the specific needs of the individual country. I am grateful for the invaluable work of Andy Adam and the CIRSE Foundation Advisory Council.

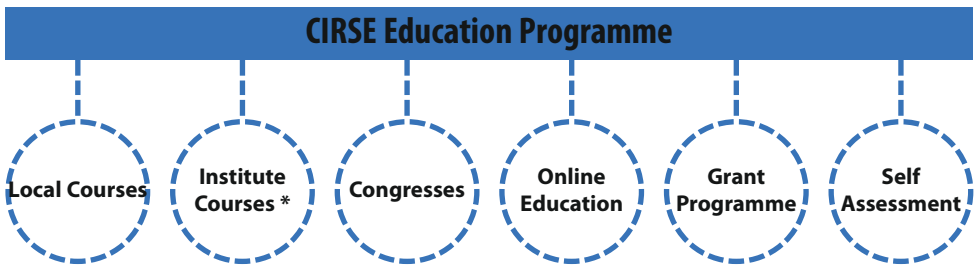
Regarding our membership the last two years were also very important, as we were able to almost double the number of CIRSE interventionists thanks to the newly introduced group membership. This unprecedented growth is granting CIRSE more political leverage than ever. Together with the Executive Committee I have tried to use it wisely in pursuit of reaching the strategic goals we set for ourselves in 2005. This brings me to my next point; thanking the CIRSE Executive Committee for its outstanding work. It has truly been a privilege and an honour to work with such competent and dedicated interventionists. I would like to thank Jim Reekers, Jan Peregrin, Andy Adam, Michael Lee, Marc Sapoval, Ricardo Lencioni, Adam Hatzidakis, Ernst Peter Strecker, Malgorzata Szczerbo-Trojanowska, Lynn Johnston, Dierk Vorwerk and José Ignacio Bilbao for their dedication and all their efforts in benefit of Interventional Radiology.

I would especially like to thank Michael Lee and the Programme Planning Committee for their outstanding work. They have managed to raise the bar for the educational content at our meetings yet again, resulting in a whopping 34% increase of attendants since 2005.

Much effort has also been made to strengthen the dedication of IRs to clinical care of their patients. We have published a paper on Clinical Care in Interventional Radiology which was officially endorsed by the EAR. For our members we have prepared a booklet on clinical care in IR which you will receive upon your return from Athens.

All of these initiatives were achieved with the help of a strong, enthusiastic and well structured new central office in Vienna. It is the back bone of our society and I would like to thank our staff for their excellent work.

I hope that my presidency and my enthusiasm for our discipline have contributed to the advancement of Interventional Radiology in general and to CIRSE in particular. I am confident that under Jim Reekers, who for years has been one of the most dedicated members of our society, CIRSE will continue to grow and prosper and I look forward to his ideas and projects.



** coming in 2008*

The CIRSE Foundation

It has been estimated that man's knowledge, which used to take millennia to double, started duplicating over centuries after 1700, over decades in the 1900s and is now proliferating over a period of mere months. Life long learning or LLL has therefore become a term as intrinsically connected to our lives as work. This especially holds true for a discipline evolving as quickly as medicine. New techniques are developed for an ever growing number of conditions and existing procedures are getting more and more complex.

CIRSE has always recognised training and further education to be one of its mayor tasks, which is why it established the CIRSE Foundation in 2000. Since then the ambitious project of creating a body to cater to the educational needs of all European interventionists has come a long way. The Foundation's development was particularly boosted in the last two years with the initiation of various projects by the Foundation Advisory Council.

The various CIRSE online education tools are an excellent way to share knowledge and experience with colleagues all year round. EPOS, the electronic poster online system first introduced for CIRSE in 2003, enables its users to view posters submitted to the CIRSE meetings at any time. Another popular tool featured on the CIRSE website is Online Lectures, allowing users to view Powerpoint presentations and recorded sessions from the CIRSE congresses. These instruments have become a fundamental part of CIRSE's educational programme, which is why the Foundation will continue to widen its online programme in the future.
A new website for online education, featuring all CIRSE e-education tools is currently being developed and will go online until the end of 2007.

In line with CIRSE's strategic plan established in 2005, the CIRSE Foundation founded the European School of Interventional Radiology after the CIRSE congress in Nice. Only a year and a half later the ESIR initiative has doubtlessly become one of CIRSE's most important educational activities, attracting a great number of local and international attendees to its courses throughout Europe.
ESIR courses offer high quality education provided by internationally renowned experts in cooperation with local physicians. ESIR basic courses are targeted at young radiologists who would like to initiate themselves in a new procedure whereas the advanced courses are for Interventional Radiologists who would like to update themselves in a specific technique and discuss their cases with other experts.

If you would like to find out more about the activities of the CIRSE Foundation, please visit www.cirse.org.

Stent grafts in acute thoracic aortic trauma

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Don't miss it !
Thoracic aorta stenting
Special Session 1401
Monday, September 10, 8:30-9:30
Room D

Blunt aortic injury is a relatively frequent occurrence with the highest incidence (up to 20%) among fatal motor vehicle accidents and tragic pre-hospital mortality ranging between 80 and 90% (1, 2). Without appropriate treatment, 30% of survivors who reach the hospital die within the first 6 hours. Usually, traumatic aortic ruptures (TAR) occur at the level of the aortic isthmus when deceleration or thoracic crushing mechanisms are involved (3).

Aortic disruption is associated with other life-threatening injuries in more than 90% of patients and 24% of them require a major operation before aortic repair (4), making the treatment for survivors extremely challenging. Patient's deaths are mostly related to the associated injuries, potentially worsened by the operation and the circulatory assistance techniques (1, 5, 6). Postoperative paraplegia is the main neurological complication, with a rate of occurrence ranging between 3% and 20% in the most experienced trauma centres (1, 3, 6).

More recently, the advent of endovascular stent graft technology has provided an attractive and less invasive treatment than open thoracic aortic replacement for thoracic aortic injury. Surgical morbidity is definitely reduced, avoiding thoracotomy, aortic cross-clamping and cardiopulmonary bypass. Moreover, spinal cord ischemic complications are uncommon, probably because of the significantly reduced duration of medullary hypotension.

Today, more than 500 endovascular repairs of aortic ruptures have been reported either in small series or case reports.

Our therapeutic strategy
Upon their arrival at the Intensive Care Unit, patients are immediately submitted to intensive resuscitation. The delay and time for treatment are dictated by general conditions of the patient, surgical risk factors and type of aortic trauma.

Diagnosis and feasibility of stent-graft therapy are evaluated through angio CT and the endovascular option is considered for patients with contained rupture having a proximal neck longer than 10 mm.

Stent-graft diameter is oversized by 15% in order to achieve a tight seal; the length must be at least 4 cm longer than the lesion to treat. The endovascular procedure is performed under general anesthesia with tracheal intubation and mechanical ventilation. The femoral artery is surgically exposed after intravenous injection of a 5000 IU bolus of heparin. With a left brachial approach or a contra lateral femoral approach, a radioopaque marker (introducer or guide wire) is placed at the ostium of the subclavian artery for optimal stent placement; this is, in our opinion, a crucial issue in the case of isthmic lesions (Fig.1). The delivery system is implanted at the pre-established level of the aortic tear. Mean arterial pressure values under 70 mm Hg are maintained during the whole implantation. Thereafter, we prefer to avoid the use of balloons, but if a type I endoleak is observed just after the implantation, a compliant balloon is inflated inside the graft, at both ends, to fully anchor the stent at the proximal and distal neck.

For traumatic lesions close to the arch we prefer to use a stent graft with a proximal non covered portion, intentionally deployed over the ostium of the left subclavian artery to allow better fixation.

Finally, after angiographic and TEE controls, the introducer sheath is removed and the arteriotomy is repaired. Anticoagulation is maintained over 48 hours, followed by antiplatelet therapy (aspirin 250 mg/d).

Angio CT or MR follow-up is scheduled at discharge at 3, 6 and12 months after the intervention and then every year (Fig. 2). If there is a complete shrinking of the aorta around the stent graft at one year, only plain x-ray exam with different projections could be suggested to avoid CT irradiation (especially in young patients).

Results (Table I)
We recently published our experience on 33 patients with acute thoracic aortic rupture treated with stent graft placement (7) at our institution between January 1996 and July 2005. In this series, no aortic re-interventions or additional endovascular procedures were carried out. No major complications or perioperative deaths occurred. According to the literature (8-29), our patients showed complete healing of the aortic wall without any residual pseudo aneurysm and complete shrinking of the aorta over the stent graft on follow-up CT scans (mean follow-up of 46 months). All the stent grafts were normally patent; at follow-up we did not observe any secondary endoleak, migration, twisting, kinking or graft infection among stent-related complications. These results were probably reached due to the good condition of the aorta which is usually healthy proximally and distally to the rupture site.

Finally, in a study comparing two groups of patients with similar lesions and severity scores (ISS) treated respectively with surgery (35 patients) and endovascular therapy (29 patients) we confirmed that stent-graft therapy is an advantageous alternative to conventional open surgery for treating aortic ruptures, on the basis of mortality and paraplegia rates observed (21 and 7% respectively in the surgical and 0% in the endovascular group), with a mean follow-up of 46 months (13 – 90) (9).

Table 1: Endovascular treatment: results of literature review

	N	Mortality	Paraplegia	Complications (n)
Thompson et al	5	0	0	0
Fujikowa et al	6*	1**	0	0
Orend et al	11	1**	0	2 II ^{ary} vascular surgery
Lachat et al	12*	1**	0	1 endoleak II ^{ary} stent graft
Daenen et al	7	1**	0	0
Czermak et al	6	0	0	1 endoleak II ^{ary} stent graft
Melnitchouk et al	15	1	0	Type I endoleak (1)
Scheinert et al	10	0	0	Renal failure (1)
Marty-Ané et al	9	0	0	0
Orford et al	9	1	0	Arm ischemia (1)
Amabile et al	9	0	0	0
Personal experience	33	0	0	1 atelectasia
Total	**128**	**6 (5%)**	**0**	

** Emergency cases, ** not procedure related*

Potential limitations
The main potential limitations for an endovascular treatment are the anatomic site of rupture, problematic vascular access, aortic diameters and eventually the long term.

1. Technical success greatly depends on the rigorous respect of anatomic criteria, mainly the length of the proximal neck which must be at least 10 mm beneath the origin of the left subclavian artery. If needed, covering the left subclavian artery in order to get a longer proximal neck is feasible. We would like to point out that before excluding the left subclavian artery an accurate assessment of the vertebral circle competence must be done. This can easily be accomplished by preoperative angiography just before the implantation. In the next future, the availability of stent grafts with a "proximal" subclavian branch could avoid LSCA occlusion, improving proximal anchoring and sealing at the same time.
2. As most injuries occur at the aortic isthmus, the placement of rigid devices in an angulated aortic arch has been a matter of concern, but today the newer, more flexible devices are overcoming this issue.
3. Vascular access is another determinant for the technical success of the endovascular procedure. Spasm can also be a frequent complication in young patients.
4. The aortic diameter in young patients, which is often smaller than 20 mm, might represent another limitation due to the lack of small, commercially available endovascular devices and the expected physiological growth of the vessel. Although we selected significant over-sizing of the stent graft for young patients, we did not detect any complications, but good late remodelling of the prostheses in all cases.

All in all, in spite of these very good short and mid-term results, the long-term results of endovascular repair remain unknown, which is why a close morphologic follow-up remains essential.

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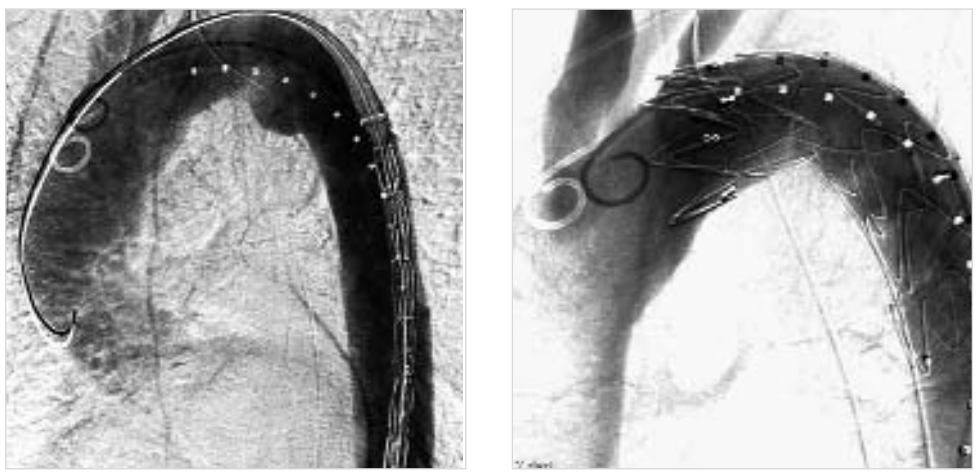


Fig. 1:
Typical aortic injury of isthmus before and after stent graft insertion.
Angiography before and just after the implantation of the non covered part of a Valiant device over the left subclavian artery ostium, with a complete exclusion of the pseudo aneurysm.
A radio opaque marker inside the ostium of the left subclavian artery is crucial to implant the stent graft accurately at the isthmus. Two options could be used : A) put a marker from the left brachial approach, B) place a small guide wire in the LSA from a femoral approach, like in this case (a 6 F introducer catheter allowing the insertion of an angiographic catheter by the same route).

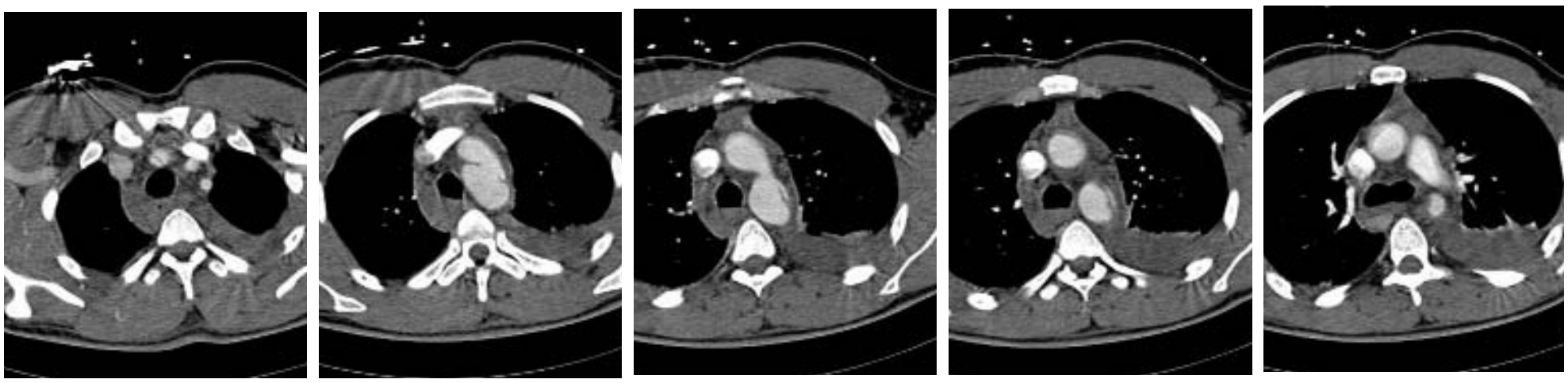
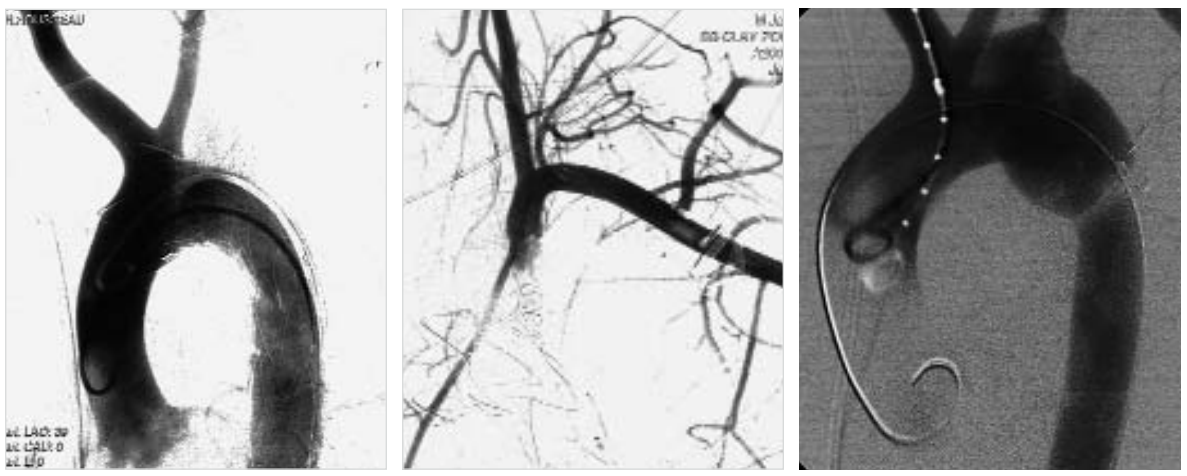
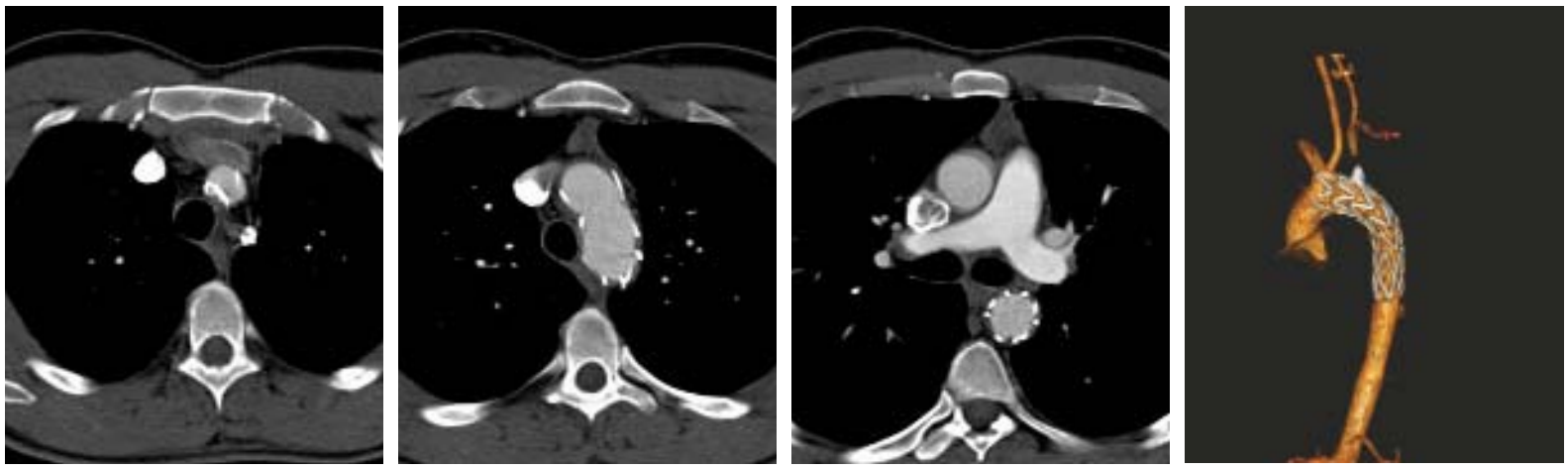


Fig. 2:
The success of an endovascular procedure greatly depends on the rigorous respect of anatomic criteria, mainly the diameter and the length of the proximal neck which must be 10 mm or more beneath the origin of the left subclavian artery. In this case the aortic rupture was in front of the LSA, with a "pseudo coarctation syndrome", with a compression of the true lumen.



A stent graft insertion and an occlusion of the LSA were done with coils to exclude the false aneurysm.



Spiral CT with 3D surface shaded display reconstructions, 6 months after treatment, showing complete regression of the pseudoaneurysm. Note the intentional exclusion of the left subclavian artery, with a reverse flow from the left vertebral artery. No symptoms are reported by the patient.

Advertorial

A step forward in SFA stenting

Peripheral vascular pathologies affect millions of people in Europe and worldwide. The incidence of walking impairment is particularly alarming in the elderly population with significant consequences in terms of quality of life for Intermittent Claudication patients. The more advanced stage of Critical Limb Ischemia, although impacting just a few percentage points of the overall number of peripheral vascular disease patients, represents a life-threatening condition.

With the emergence of endovascular solutions in the '90s, a new solution was born. This new solution offers an alternative to the very invasive surgical interventions and the conservative, but sometimes ineffective exercise and medical strategies. Several minimally invasive techniques utilizing different concepts to treat Superficial Femoral Artery (SFA) have been shown to be feasible and safe, but many of them have not been able to demonstrate sustainable results over time or better outcome compared to other methods.

Technology solutions have constantly improved and adapted to tackle the issues that have arisen since the early days of these pioneering therapies. In the stent field, the first experiences with balloon expandable stents or with Elgiloy self expandable stents have yielded results comparable to plain balloon angioplasty, with stent mechanical behavior not tailored to the complex dynamics of SFA as a possible explanation.

Much more promising results were reported later on as more flexible Nitinol stents were introduced. Different studies examined very different types of patient population (mean lesion length varied from few cms to almost twenty cms), but in some instances restenosis rates appeared to be lower than previous experiences with simple PTA have reported. On the other hand, all Nitinol stents seem not to be equal in SFA, with a clear indication coming from the wide range of stent fracture rates among the examined devices.

In order to answer most of the still outstanding questions, Prof. Schillinger and Prof. Minar (Angiology Department, University of Vienna) in collaboration with Prof. Lammer (Radiology Department, University of Vienna) designed a randomized controlled trial to compare the most common endovascular approach (angioplasty with usage of Nitinol stents as a bailout measure in case of failure of PTA) versus a more aggressive alternative (direct stenting with Nitinol stent). The device of choice was ABSOLUTE Peripheral Stent System, with some units of the Absolute predecessor, Dynalink, used as well. The two devices share the same stent body architecture.

From June 2003 to August 2004, 104 patients with PAD Rutherford stages from II to V and target lesions TASC B, C and D, were enrolled in the trial. Inclusion criteria required at least one crural run-off vessel. He Protocol prescribed treatment 5000 IU Heparin peri-intervention, aspirin and clopidogrel for three months, and aspirin alone indefinitely thereafter. Out of the 53 patients randomized to the PTA + optional stenting arm, 17 (32%) actually received a stent. All stents in both arms were deployed without any issue for a procedural success of 100%. Treated segments were particularly long, especially compared to previous randomized study. In fact, the average stented length was 13.2 cm for the primary stenting arm, whereas the PTA + stenting arm received treatment on 11.8 cm. In all patients in which the treated segment was longer then 10 cm, overlapping stents were implanted. The Primary endpoint was angiographic binary restenosis at 6 months, but a number of secondary endpoints were included in the protocol to assess the hemodynamic status of the patients as well as their clinical condition.

At 3 and 6 months, all patients underwent follow-up evaluations, including Ultra Sound Doppler and angiographic imaging. Angiographic outcome showed a statistically significant difference in favor of primary ABSOLUTE stenting (restenosis rate 23.5%) versus PTA plus optional stenting (43.4%) [p = 0.05]: these results obtained with an intention-to-treat analysis were confirmed when all patients receiving a stent were compared with all patients not receiving a stent with a per-protocol analysis. ABI and walking distance tests showed a clinical benefit of these superior angiographic results.

On May 2006, 12-months results of the ABSOLUTE Vienna trial were published on New England Journal of Medicine. Compliance at follow-up was extremely high (101 patients out of 104). The 12 months follow-up results showed superiority for primary ABSOLUTE stenting patients compared to PTA + optional stenting in restenosis rates (evaluated with Ultra Sound Doppler) in ankle-brachial index and in maximum walking distance. An interesting finding was that patients who on average were not able to walk more than 80 meters after the intervention were able to triple or quadruple their walking distance, especially for the primary ABSOLUTE stenting patients.

Finally the study looked into stent integrity at follow-up. Stent fracture was identified as one of the risks of Nitinol stent placement in SFA. This finding was highlighted in several previous studies. In all patients implanted in the study with ABSOLUTE stents, just one fracture was detected and possibly can be attributed by a surgical intervention in the region of implant. This finding is consistent with other studies in which ABSOLUTE showed a propensity for excellent fatigue resistance.

Although these results were considered promising, longer follow-up is considered critical to assess the efficacy of the treatment. Results of 24-month follow-up on 98 out of 104 patients were published in Circulation in May 2007 and were consistent with those obtained earlier. Restenosis rates, ABI values and maximum walking capacities once more proved to be better for the primary ABSOLUTE stenting group. At 2 years, primary stenting of long SFA obstruction lesions with self-expanding ABSOLUTE stents yields a sustained morphological result and a trend toward clinical benefit compared to balloon angioplasty with optional stenting.

Sources: Circulation 2007; 115-2745
N Engl J Med 2006; 354:1879-88

Advertorial

Datascope introduces the Safeguard 24 in the interventional radiology market to reduce the active compression time[1]

Why should an interventionist hold pressure when Safeguard can? Let Safeguard assist the physician in obtaining and maintaining hemostasis. The Safeguard Manual Assist Technique (SMAT) clinical trial demonstrates that Safeguard 24cm is safe and effective in reducing active compression time in femoral artery cannulation following diagnostic and interventional procedures. Safeguard simplifies pre- and post-hemostasis management of the access site. It reduces demands on the staff, maximizes valuable resources, and enhances patient comfort.
Safeguard 24cm reduces active compression time[1]. For diagnostic cases a 5-minute minimum active compression time and for interventional cases a 10-minute minimum active compression time is needed.
It was shown that this results in a lower complication rate: Safeguard has a lower mean complication rate vs. manual compression. In a patient cohort of 101 the total major complication rate (n = 101) was 1% for the Safeguard patients compared to the historical control rate of manual compression[2] of 2.4%.

Safeguard 24 generates real pressure, it delivers adjustable active compression
and enables immediate pressure adjustment. It maintains consistent pressure on the site during patient recovery as well as patient positioning and transport. Also it provides site management control for non-compliant patients.
Safeguard facilitates site assessment through the clear window without removing the device.
Overall it can be used as a sterile dressing to protect the site from contamination.
The Safeguard 24cm bulb pressures[3] with 0 cc's of air creates an average force of 0.05 kg, with a bulb pressure of 20 cc's of air of 2.2 kg, respectively with 30 cc's of air 5.268 kg and with 40 cc's of air an average pressure of 8.518 kg.
Safeguard is comfortable for the patient, maintains consistent pressure on the site when obtaining hemostasis with manual compression. Safeguard adheres to the patient while inflated regardless of patient's anatomy.
In the clinical study, 87% of patients who had undergone a catheterization procedure in the past indicated that Safeguard with MAT was "much more comfortable" than
any previous procedure

[1] = Data on File: Multi-Center Trial of the Safeguard Manual Assist Technique.
[2] = Manual compression subset from the "Reduced Vascular complications After Percutaneous Coronary Interventions with a Nonmechanical Suture Device: Results from the Randomized RACE Study, Sanborn, TA.
[3] = 10 Units were included in each sample set. These are laboratory measurements, plate-skin and muscle tone may influence the force delivered. Data on File.

Tools and principles of embolization

Jafar Golzarian
Professor of Radiology
Director of Interventional Radiology
University of Iowa, USA

Vascular Embolotherapy or Embolization is defined as the percutaneous endovascular use of one or more of a variety of agents or materials to accomplish vascular occlusion. Embolization has made a remarkable surge during the last two decades driven by improvements in imaging, breakthroughs in microcatheter technology, the refinement of existing materials and the development of new embolic agents and devices. The number of applications of embolotherapy continues to expand, making this technique an important player in the daily practice of Interventional Radiology.

The ideal vascular occlusion technique should combine accurate guidance and delivery to the target with low risk of injury to normal structures. This characteristic is a function of various specific attributes: radio-opacity, radio-opaque markers or ability to mix into radio-opaque suspension, simplicity of the delivery technique, reliability of delivery mechanism, ability to reach distal vascular beds, amenability to trouble shooting/salvage in case of complications or device malfunction, efficacy or the ability to result in rapid occlusion for a duration appropriate to the desired application, being adaptable to allow selective occlusion of various vessel types and sizes, biocompatible components and cost competitiveness.

Numerous devices or materials have been used to accomplish effective vascular occlusion. Broadly speaking, embolic materials can be classified based on their physical and biological properties. The majority of non-neurovascular embolization procedures are currently performed with coils, Gelfoam, particles and liquid sclerosants. There has also been an increased interest in plugs, solidifying liquid mixtures and tissue glues. Mechanical embolic agents function by causing a direct mechanical obstruction of the lumen as well as providing a matrix for thrombus formation ultimately resulting in occlusion. Certain agents can also incite an inflammatory reaction in and around the vessel which further accentuates the occlusive effect. Liquid sclerosant agents such as absolute alcohol cause direct destruction and denaturation of endothelial proteins.

Of all the attributes and features of an embolic agent, the main factors influencing its selection in a specific application relate to the desired level of occlusion in the vascular tree and the desired permanency of occlusion. For example, when dealing with traumatic or degenerative hemorrhagic conditions, small particulate and liquid agents should be avoided, as they can reach the capillary level resulting in significant non-target ischemia and infarction. On the other hand, such agents may be perfectly appropriate in treating some hypervascular tumours.

Embolotherapy requires a delicate balance between safety and efficacy. Therefore, all involved parties (including the interventionist, referring physician and the patient or patient's family) need to be in agreement about expectations and risks before proceeding. The following criteria must always be satisfied:

- Clinical appropriateness of embolization
- Prop er pre-procedural imaging studies and/or angiographic localisation of the bleeding abnormality or target vessel(s)
- Accurate determination of target vessel size
- Accurate assessment or the status of collateral circulation
- Appropriateness of embolic agent choice
- Availability of modern angiographic equipment and a full array of diagnostic and interventional devices and supplies
- Technically skilled and experienced operator including knowledge of trouble shooting techniques

Familiarity with a variety of specific trouble shooting techniques is an important prerequisite to success in embolotherapy. When embolising a large vessel, coil stability is essential. A study of the effect of sizing on stability suggests that a certain degree of over-sizing is essential to minimize the risk of dislodgement. However, this should be weighed against the negative effect of an elongated and incompletely formed coil on haemostasis.

An oversizing ratio of around 15% has been suggested in arteries, although in veins more oversizing is required. Some authors recommend the use of tightly packed nested coils to enhance haemostatic efficacy. Newer detachable coil designs allow testing of stability before detaching the coil and are preferable in high-risk situations. Occlusion balloons in a high flow situation or when using liquid agents are very useful to prevent non-target embolization. Of all trouble shooting techniques, the ability to quickly retrieve misplaced or migrated coils is a crucial skill.

Recently, the particulate embolics have been subject to the most interesting developments in the field of embolization. With the advent of the spherical particles and the possibility of loading them with radioactive elements or active drugs, several new indications have been developed in this field. The theoretical advantages of drug-loaded implants are numerous: higher local concentration and lower total dose of the drug compared to a systemic administration and finally the possibility to use drugs that are potentially toxic using the systemic route.

Different types of eluting spheres are available. They can behave like sponges able to absorb large amounts of water or drug in solution. The release system can be considered as a ready-to-load platform for water-soluble drugs, but a release can occur in the medium before and during injection. Some microspheres can swell up to 4 times their original size in contrast. The electric charge of particles can be used to elute medications with an opposite charge. Specific polymers can be used to adsorb a given drug which reaches high concentration inside the biomaterial. This product is susceptible to release the drug on a long-term basis.

The novel drug-delivery system has recently been evaluated for intra-arterial treatment of hepatic lesions. Doxorubicin-eluting beads are designed for intra-arterial infusion and selective tumour targeting with or without a biodegradable matrix. Irinotecan-eluting beads for metastatic colon cancer are also under development.

Vasoactive drugs, prothrombotic agents and antiangiogenic factors can enhance or prolong the duration of arterial occlusion. Hormones, growth factor inhibitors and antimitotics may prevent local tumour regrowth. Analgesic or anti-inflammatory drugs may reduce post embolization pain after embolization. Different research projects are ongoing to evaluate the feasibility and the effects of loading analgesics or anti-inflammatory drugs onto calibrated microspheres.

One extension of the use of these biologically active agents is the implantation of cells in diseased organs. Islet cells, for example, are injected as embolic agents through the portal vein (islet cell transplantation) to treat Type I diabetes mellitus. More than 80% of the patients have been able to discontinue insulin. Although this process is still restricted to severely hyperglycemic patients, it may become the standard of care in the future.

Parallel to the exciting evolution of the embolic materials, the microcatheter technology has also evolved allowing a much better distal vessel catheterization and superselective embolization technique. The knowledge of different peripheral and neurointerventional microcatheters and wires is an important asset to achieve the superselective embolization goal.

Finally, the technique for injecting the embolic particles is of paramount importance. Flow-directed injection of the particles respects the physiology of the circulation. Forceful injection can result not only in vessel damage or reflux, but may also provoke the opening of the normal vascular anastomosis with subsequent non-target embolization in some cases.

Embolization therapy has become a major arm of modern interventional therapy, its applications being fundamental cores in the multimodality treatment paradigms for trauma, oncology and endovascular therapy of vascular malformations and aneurysms. Embolization is rapidly evolving toward an excellent mode of drug delivery. The knowledge of different techniques, materials and vascular anatomy and variants are essential to obtain good clinical outcome and minimize complications.

Don't miss it !
Thoracic aorta stenting
Special Session 1401
Monday, September 10, 8:30-9:30
Room D

CIRSE Membership Services

CIRSE Clinical Practice Manual now available

As part of CIRSE's efforts to support Interventional Radiologists to shift from providing a technical service to taking full charge of the clinical care of their patients, the CIRSE Clinical Practice Task Force under the chairmanship of CIRSE President Johannes Lammer has published a manual on clinical practice. Its purpose is to help IRs promote themselves directly to referring physicians as specialists in assessing and treating organ systems or diseases.

Following the opening chapter on principles of clinical care, two chapters are dedicated to the resources required for setting up a hospital-based clinic or private office. A further chapter deals with marketing one's services to referring physicians, patients and the public. The greater part of the manual offers clinical guidance on medical conditions, indications and treatment options IRs needs to be aware of in order to provide informed advice to patients. Cardiovascular risk factors, the metabolic syndrome, hypertension, diabetes and cardiovascular disease are discussed, just to name a few.

Further chapters refer to specific conditions and their interventional treatment focus: carotid stenting, hemodyialisis fistulas, hepatocellular carcinoma, neuro-endocrine tumours, uterine fibroid embolization and vertebroplasty are discussed. For the sake of readability, the information provided has been reduced to a minimum with references pointing to more detailed reading in the dedicated literature. Sample medical history, physical and vascular examination forms can be found in the annex of the manual.

We hope that this manual will help IRs to achieve greater involvement in clinical practice for the benefit of the patient. A second publication to focus on the management of emergency and complicated situations in the cath-lab or during the postprocedure period is already planned for.

A copy of the CIRSE Clinical Practice Manual has recently been sent to all CIRSE members. Non-members may purchase the manual at the CIRSE society booth for €120.

Authors: Trevor J. Cleveland, Alexis D. Kelekis, Christoph Kopp, Thomas Kröncke, Johannes Lammer,

Interview with Jérôme Erath, General Manager ev3 Europe

Jérôme Erath
General Manager ev3 Europe

Can you please tell us what type of company ev3 is?

ev3 was founded with the idea to be very responsive to our customers' needs. At the beginning stood our analysis that the clinical space in peripheral and neurovascular disease treatment was growing rapidly, yet it had seen little innovation in technology, devices and tools over time because the traditional big industry focuses on the DES coronary market. So we decided to address these underserved or emerging spaces by committing ourselves to advance the treatment of peripheral and neurovascular disease. Our mission hence is to prove innovative technologies that specifically address the needs of endovascular specialists and their patients. Since our inception almost 7 years ago, we have vigorously pursued this objective: today we have reached global market coverage with presence in the US, Europe, Canada and a representation through distributors and agents in the rest of the world. We have launched over 25 products in the last four years and most of our current revenue comes from products developed in the last two years. Our product offerings covering the peripheral and neurovascular markets is one of the broadest and most technologically advanced: PTA balloons, stents, embolic protection devices, infusion catheters/wires, embolic coils, liquid embolics and access devices. We believe that we are only medical company focused solely on the endovascular device field.

Where does the name ev3 stand for?

The endovascular field is conventionally divided in three segments defined by anatomic location: cardiovascular (heart), neurovascular (brain) and peripheral vascular (rest of the body). Our name, ev3, precisely signifies our intent to serve these three markets. Our today's focus is specially on the neurovascular and peripheral vascular segments.

Do you develop and manufacture your products yourself?

Yes. Our R&D and manufacturing facilities are located in Plymouth, Minnesota and Irvine, California. These are truly outstanding facilities committed to constant innovation and our latest products reflect that. As an example, we are the first company that introduced a 150 mm stent specifically designed for the SFA. First generation stents are prone to fractures when exposed to the tremendous forces in the SFA and this need was emitted by Interventionalists. The challenge our engineers had was to develop a dedicated stent to address these specific demands of the SFA. Our development teams responded by designing the PROTÉGÉ EverFlexTM. We tested this stent in rigorous simulated fatigue testing conducted by an independent facility and it demonstrated fracture resistance up to ten times larger than any of the competitive stents tested. Currently, we are conducting the DURABILITY trial to confirm these excellent bench data in a clinical setting. Enrollment of this 150 patients study was completed in June of this year, and the first results will be presented at the LINC congress in January 2008. And our R&D teams are working on making even longer stents for the SFA!

What products do you offer in the cardio-peripheral arena?

You can divide our product portfolio into stents, embolic protection and procedural support. In fact, we offer a complete stent portfolio for peripheral interventions covering the carotid, renal, biliary, iliac and femoral arteries. Well known brands are the PROTÉGÉ EverFlexTM for the SFA, the PROTÉGÉ RX for the carotid arteries and the PROTÉGÉ GPSTM for iliac applications, the Spider FXTM Embolic Protection System and the X-Sizer Thrombectomy device. Examples of products for procedural support are the Nitrex® guidewires and Amplatz Goose Neck® Snares.

What products are most doctors interested in here at CIRSE?

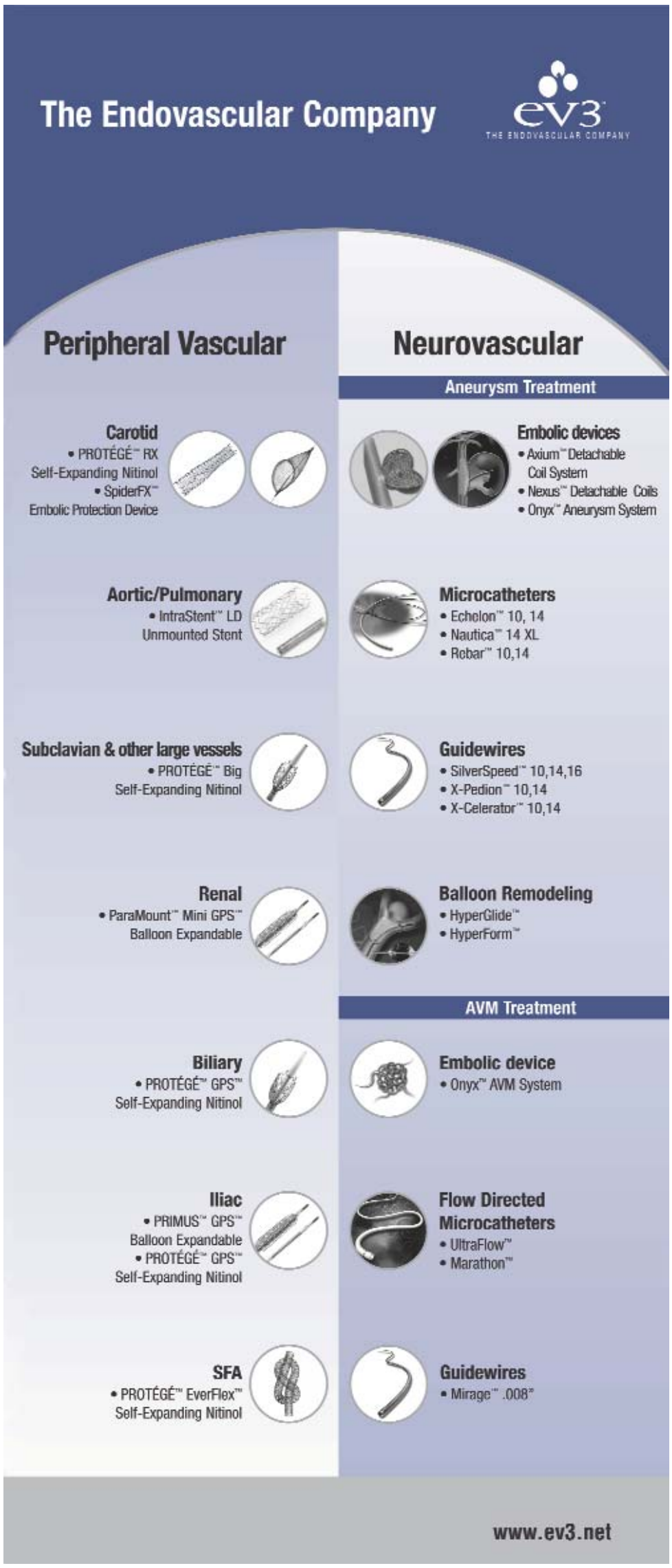
There is a high interest in our products for Carotid Artery Stenting and SFA. For Carotid Artery Stenting, we offer the Protégé® RX stent in straight and tapered versions with various lengths and diameters, along with the Spider FXTM, the only embolic protection system in the market that allows the operator to use his/her wire of choice to cross the lesion. Clinical studies conducted in Europe and the US (ProCar, CREATE) have proven the outstanding safety and performance of these products.

Of course there is a lot of interest in our PROTÉGÉ EverFlexTMstent which I mentioned before. We offer it in lengths ranging from 20 to 150 mm to improve the long term outcome of treating the diffuse nature of the disease in the SFA. In addition to producing these long SFA stents, we are also working on introducing the EverFlex technology across our self-expandable stent line to include a small diameter stent for below the knee applications.

In addition to this, many physicians want to know more about the peripheral applications of OnyxTM. This embolic agent is already used very frequently for brain AVMs, but is more and more used to treat peripheral AVMs, renal and hepatic aneursysms, liver tumours, bleedings and type II endoleaks.

What can we expect from ev3 in 2008?

Our aim is to establish further the difference that ev3 brings to the endovascular field in covering underserved needs and advancing treatment options to physicians and patients. We are accelerating our clinical and research & development initiatives and continually expanding our product portfolio in our focus areas. In 2008 we will continue to make incremental improvements in our existing products by making them more flexible, or smaller in diameter, so that physicians can treat vessels a little further down in the leg or further up into the brain. Organic innovation is the life blood of our company, so we will cont inue to provide our customers with innovative endovascular products.



When to place a stent in peripheral vascular disease

Dimitrios Tsetis
Department of Radiology
University Hospital of Heraklion
Medical School of Crete, Greece

Don't miss it !
Management of peripheral vascular disease IV
Foundation Course FC 1504
Monday, September 10, 10:00-11:00
Room A (Trianti Hall)

The application and continuous improvement of stent technology has dramatically altered the treatment of peripheral artery disease. Accepted indications for aortoiliac stent placement are persistent trans-stenotic mean pressure gradient >5mm Hg (or >10mmHg greater during pharmacologically induced vasodilation), 30% or greater residual stenosis or occurrence of dissection following angioplasty. Although many interventionists find it intuitive to apply primary stenting (stent placement after predilation of the lesion regardless of the PTA outcome) or direct stenting (stent placement without predilation of the lesion) along chronic aortoiliac artery occlusions and complex stenoses (eccentric, calcified, ulcerated plaques or plaques with spontaneous dissection), a recent multi-centre randomized trial showed that this practice is not superior to balloon angioplasty with selective stenting with respect to morphological and clinical outcomes (1).

The choice of the appropriate stent type depends on lesion morphology and location. When dealing with lesions of high elastic recoil, such as calcified or eccentric plaques at the ostium of CIA or EIA, a balloon-expanded stent would be more appropriate compared to a self-expanding stent due to its greater hoop strength (2,3). A self-expanding stent should be chosen to stabilize longer, less calcified vessel segments (Fig.1). In tortuous vessels and in vascular segments that transit abruptly in size (for example from a CIA to an EIA 2 mm smaller in lumen size) self-expanding segmented nitinol stents (laser-cut from a single nitinol tube) should be used, assuring good flexibility and vessel conformability when employed (3). The "kissing stent" technique by deploying the stents simultaneously and recreating the aortic bifurcation is commonly applied when dealing with the distal aortic segment including the origins of the common iliac arteries. Kissing stents should ideally extend 5-15 mm into the distal aorta (4).

Before the era of nitinol stents, femoropopliteal stenting was recommended only for bail-out procedures after technical failure of plain balloon angioplasty (Fig. 2). Balloon expandable stents are not suitable for the femoropopliteal segment, as they are prone to external compression without the capability of regaining the original lumen. Although not completely understood, the properties of recently applied self-expanding nitinol stents (improved radial strength, shape-memory characteristics resulting in crush recoverability and reduced foreshortening) seem to improve patency rates in this region (5, 6).

The results of a randomized controlled trial of femoropopliteal stenting with self-expanding nitinol stents versus balloon angioplasty in 104 patients with chronic limb ischemia and an average length of the treated segments of 132 and 127 mm respectively showed a sustained 2-year morphological benefit and a trend toward clinical benefit with primary stenting versus balloon angioplasty with optional stenting (7). On duplex ultrasound the restenosis rate in the stent group was 49% as opposed to 74 % in the PTA group, with significantly improved walking distances on a treadmill. Nitinol stents can be an effective alternative to surgical revascularization of longer lesions in poor surgical candidates with severe cardiovascular comorbidities and for patients without available saphenous grafts (8).

Although few data exist in the literature, stenting with self-expanding nitinol stents may also be considered in femoropopliteal subintimal angioplasty to improve patency. In a recent study, Treiman et al (9) reported a high primary patency rate of 92% at 1 year in 25 femoropopliteal occlusions in which the entire length of dissection was stented after subintimal angioplasty (1-10 stents per lesion). However, the number of patients was small and long-term data were not available. The lesion length was also relatively short (9 cm in 64%). In general subintimal stenting is reserved for salvaging a suboptimal/failed angioplasty and the use of multiple overlapping stents is discouraged as it might carry a high risk of restenosis and increase the cost.

Stent fractures may trigger neo-intimal hyperplasia and are associated with stent stenosis and reocclusion in about two-thirds of cases (10). Predisposing factors include lesion length, number of stents and type of stent used, but lesion location (i.e. proximal vs. distal SFA), type of obstructive lesion (i.e. stenosis vs. total occlusion) and walking distance (> 5000 steps) are also contributing factors to stent fracture (10-12). Multiple overlapping stents should be avoided and substituted by fewer longer stents (5, 13).

Covered stent-grafts represent valuable tools for the treatment of arterial rupture, perforation and pseudoaneurysms. The main reason to use covered stent-grafts in the femoropopliteal segment is to inhibit vascular smooth muscle cell proliferation inside the lumen of the stent-graft and ultimately to prevent luminal narrowing and occlusion. New device designs in combination with new generation antiplatelet drugs (i.e. clopidogrel) have yielded promising results in recent studies. A recent randomized prospective trial comparing Viabahn stent grafts with prosthetic femoral to above knee popliteal by pass for long SFA occlusions (mean length 25,6 ±15cm) in 100 limbs found no statistical difference in 12-month primary patency (73.5% vs. 74.2%) and secondary patency (83.9% vs. 83.7%) between the two treatment groups (14). The occurrence of edge stenosis is a significant drawback of covered stent-grafts and is comparable to bare stents. It is believed that balloon dilation beyond the edge of the stent-graft or extreme device oversize can increase the probability of edge stenosis.

In the infrapopliteal region stenting is elected as a bailout procedure in case of flow limiting dissection or recoil of the vessel (15) (Fig. 3). The application of coronary sirolimus-eluting stents (SES) in the infrapopliteal arteries has already demonstrated their ability to significantly reduce restenosis, with encouraging clinical outcome in the short term (16, 17). The superiority of SES over bare coronary balloon-expandable stents seems to be sustained in the first year after treatment (18). The preliminary experience with absorbable metal stents and carbon-lined stents has also been positive (19, 20). Recent application of a new self-expanding nitinol stent dedicated for use in the tibial arterial tree (Fig. 4) demonstrated a satisfactory 6-month primary patency of 82% (21).

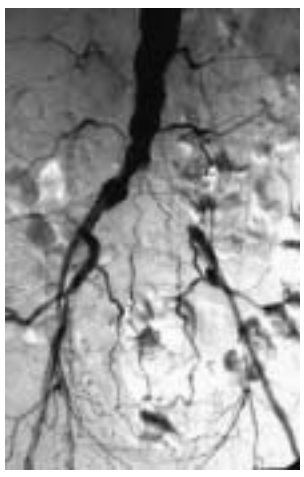


Fig. 1a: LT CIA chronic occlusion

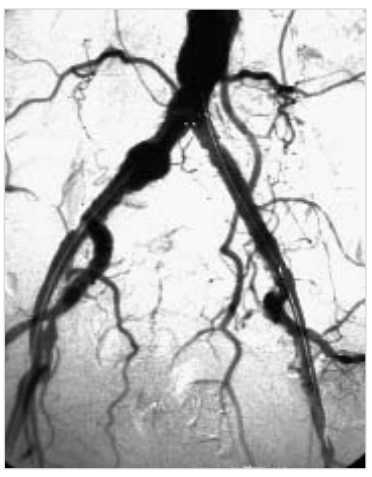


Fig. 1b: Post stenting with a 9 x 60 mm self-expanding nitinol stent

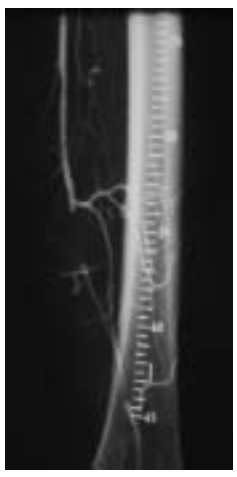


Fig. 2a: Short dist SFA occlusion

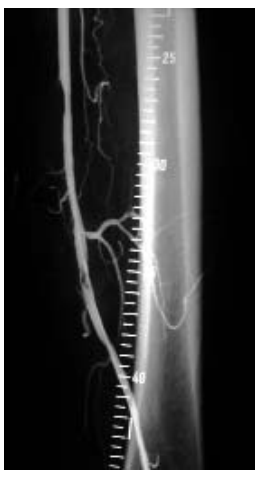


Fig. 2b: Obstructive flap following PTA

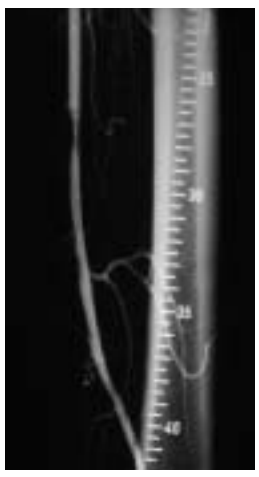


Fig. 2c: Post implantation of a balloon expandable tantalum (Strecker) stent

Fig. 3a: LT tibioperoneal trunk (TPT) occlusion

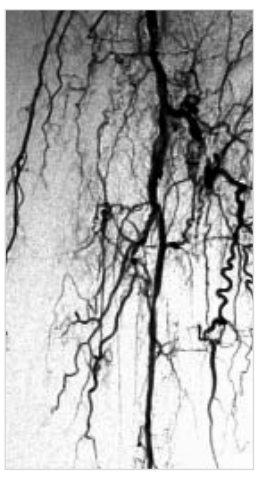


Fig. 3b: Post PTA flow-limiting TPT dissection

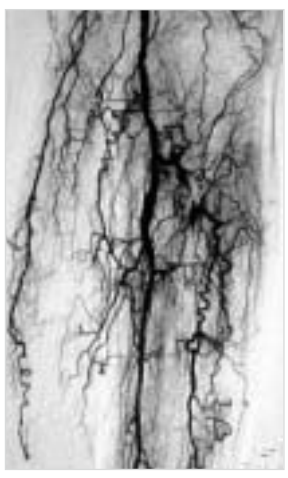


Fig. 3c: Post TFT stenting

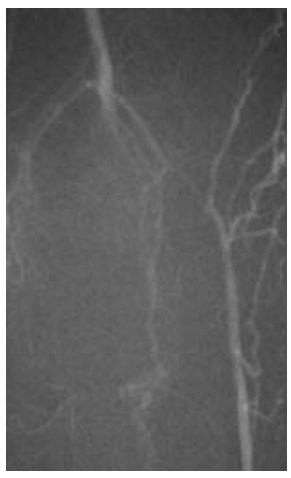


Fig. 4a: LT proximal anterior tibial artery (ATA) chronic occlusion

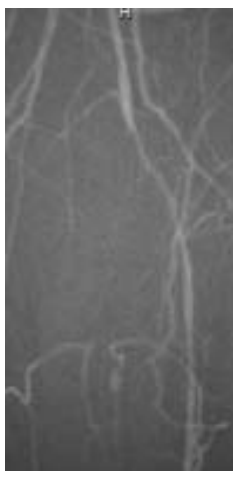


Fig. 4b: Post PTA residual stenosis

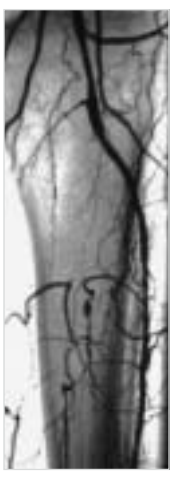


Fig. 4c: Post implantation of a 4 x 60 mm XPERT stent

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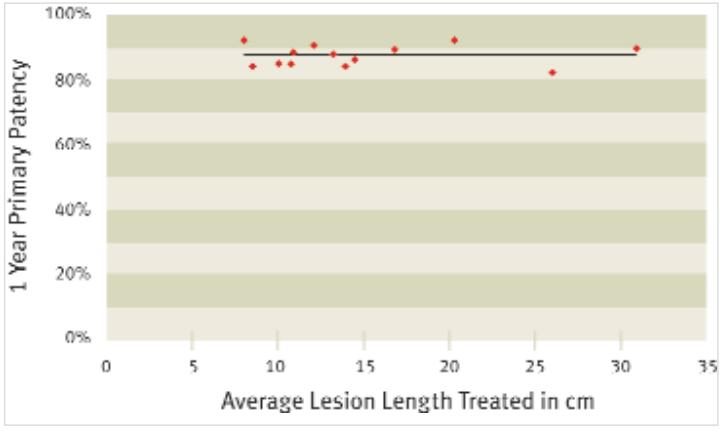
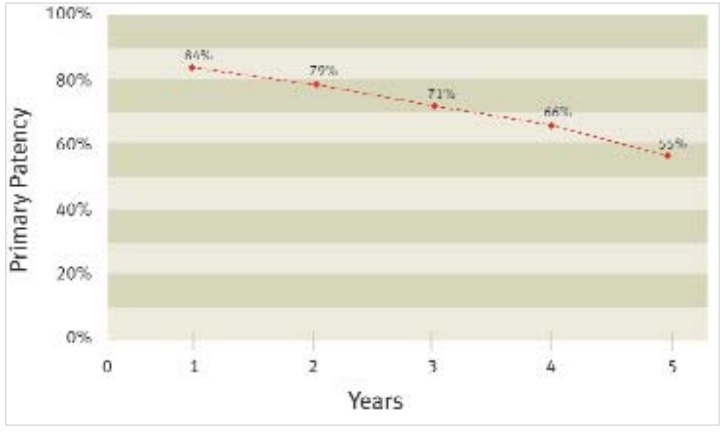
Advertorial

GORE VIABAHN® Endoprosthesis has a 5 year proven track record to effectively treat long SFA lesions



*GORE VIABAHN® Endoprosthesis SFA One Year: Primary Patency Based on Lesion Length and Based on 708 Limbs from 14 Studies**



*GORE VIABAHN® Endoprosthesis SFA Primary: Patency Based on 708 Limbs from 14 Studies**

** Data on file and available upon request.*

The GORE VIABAHN® Endoprosthesis is a flexible, self-expanding endovascular prosthesis intended for endovascular grafting of peripheral arteries. The GORE VIABAHN® Endoprosthesis is secured to the leading edge of a polyethylene delivery catheter, and is designed to facilitate percutaneous revascularization following successful balloon angioplasty of peripheral arteries. Potential peripheral indications for the GORE VIABAHN® Endoprosthesis include peripheral obstructive disease, stenosis, occlusion, aneurysm, trauma, fistula and dissection / failed PTA.
The device consists of a thin expanded polytetrafluoroethylene (ePTFE) graft on the inside and a nitinol (NiTi) support structure on the outside. The GORE VIABAHN® Endoprosthesis is designed to allow percutaneous revascularization of peripheral arteries. It can also be used after making a small surgical cut-down to access the artery.

Patients suffering from Peripheral Arterial Disease (PAD) can present symptoms such as claudication, rest pain, tissue loss, and gangrene. When faced with PAD, a number of therapeutic options are available to the physician. In particular, for severe claudication or critical limb ischemia, options include surgical bypass or endovascular stenting to restore blood flow. The GORE VIABAHN® Endoprosthesis has increased the options available and has proven to be valuable in specific indications. It carries the advantages associated with minimally invasive techniques, including minimal tissue trauma, reduced pain, shorter hospital stay and lower complication rates.
Compared to bare stents or to other covered stents (stent-grafts), the GORE VIABAHN® Endoprosthesis offers the following advantages: anteriority, clinical history, and self-expanding with ePTFE inside the stent (no metal contact with blood flow). Several peer-reviewed papers on its use for the treatment of superficial femoral artery lesions published results up to 5 years follow-up.
Long lengths (15 cm) are available for treatment of long stenosis / occlusion using one stent-graft only. The device is highly flexible, offers precise deployment, and has no foreshortening.
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Advertorial

Stenting of the superficial femoral artery: from clinical research to clinical practice

Jos C. van den Berg, MD PHD

Over the last decades (endo)vascular surgery has made a remarkable progress in the management of chronic ischemia of the lower extremities. In the wide range of treatment modalities there has been a change from invasive bypass operations to more refined techniques like endarterectomy and percutaneous dilatation of arterial stenoses.
The superficial femoral artery (SFA) is a relatively hostile environment for implanted material and therefore the endovascular treatment of stenotic and occlusive disease of this artery remains one of the biggest challenges in current vascular practice. Several (randomized) studies using "old" stent technology (either balloon-expandable stents or self-expandable Wallstents) demonstrated that percutaneous transluminal angioplasty (PTA) of SFA lesions, had a primary technical success rate that can vary from 70 up to 90%, but with long-term results comparing unfavorably to PTA in other vascular territories : stenting leads to a higher initial success, but as well to similar or even worse long-term results in the stented patient groups.

The first indications suggesting that clinical outcomes of SFA stenting using new stent technology had improved came from a randomized trial that was performed to evaluate the impact on outcome using drug-eluting nitinol stents. Several other retrospective studies evaluating mid- and long-term results have confirmed the better results obtained with more recent stent technology. Even when treating longer and more complex lesions, primary patency rates of up to 80% at 1 year have been reported. Currently published data of one randomized trial are available and the data confirm the trend to better outcomes using nitinol stent technology when treating long lesions. Control angiography at 6 months follow-up, demonstrated a > 50% restenosis in 24% and 43% in the angioplasty group and stent group respectively, according to the intention to treat. Reanalysis of these data according to the actual treatment received (per protocol) yielded restenosis rates of 25% after stent implantation and 50% after angioplasty without stenting. This difference in outcome was sustained at 12 months, where duplex ultrasound demonstrated restenosis rates of 37% and 63% for stenting and angioplasty respectively (intention to treat). Walking distance on a treadmill was significantly longer, and ankle-brachial index was significantly better in the stent group at both 6 months and 12 months. The benefit of stenting persisted at 2 year follow-up, with a statistically significant better morphological outcome and a trend toward a better clinical outcome of primary stenting as compared to balloon angioplasty with optional stenting. Reintervention rates tended to be lower after primary stenting. However, the results of the FAST trial (randomized study of PTA versus primary stenting in a patient group with short lesion length (mean length 45 mm) failed to demonstrate a difference in outcome, indicating that PTA as standalone works well in short lesions.

Table 1: 6-months data RESILIENT

	PTA (n=72)	Lifestent (n=134)	p-value
Clinical success (%,(N))	25.0 (18)	64.9 (87)	< 0.0001
Primary patency (Duplex), %	50.1	94.6	< 0.001
Freedom from re-intervention, %	54.1	95.3	< 0.001

The Edwards LifeStent, which has been specifically designed for the SFA is currently under clinical evaluation. The clinical program encompasses both a prospective multi-center randomized trial (RESILIENT) and a prospective multi-centre European registry (ELODIE - SFA disease & MELOPEE - popliteal disease). The results of the RESILIENT trial at 6 months are listed in table 1 and we expect to see the first 12 months results very soon. The trial shows a low stent fracture rate of 1.2% at 6 months, which seems to confirm the benefits of the LifeStent helical structure in the mechanically challenging SFA environment.
The ELODIE registry is the first clinical study that will evaluate long-term outcomes in patient subgroups stratified according to the new TASC II classification. The first results on RESILIENT, ELODIE and MELOPEE will be presented at the CIRSE 2007 meeting.

In conclusion, the results of endovascular treatment of stenotic and occlusive atherosclerotic disease of the SFA (both short and extensive lesions) have improved significantly when using new nitinol stent technology, although not all stents demonstrate equal results. The development in technology, optimization of pharmacotherapy and the better clinical results have resulted in a significant change of the TASC recommendations, that now allow for a more endovascular approach of lesions of the superficial femoral artery.

References available upon request.

DC Bead™: A new tool for TACE for the treatment of Hepatocellular Carcinoma (HCC)

Don't miss it !
New approaches in the intra-arterial therapy of HCC
Special Session SS 1503
Monday, September 10, 10:00-11:00
Room D

Katerina Malagari
Associate Professor of Radiology
University of Athens, Greece

Dimitrios Kelekis
Professor of Radiology
Imaging and Research Unit
University of Athens, Greece

Associate Professor K. Malagari and Professor D. Kelekis from the University of Athens, had launched the Athens registry to treat HCC with DC Bead in 2004. The study was completed in June 2006 and included patients with HCC and well preserved liver function. A total of 71 patients had enrolled by that time with localized tumors. Beginning the fall of 2006 their centre participated in the Precision V trial. Dr M. Pomoni also joined in the treatment with DC Bead. The endpoints of the Athens registry, that was a single arm study were safety, tumor response and survival. Overall complete response was observed in 15.5% while overall objective response ranged from 66% to 100% between successive sessions. Survival at 12 months was 97.05% and at 24 months 91%.

Properties and pharmacokinetics
DC Bead™ (Biocompatibles UK, Surrey, UK) is a soft deformable material of spherical shape composed by a polyvinyl alcohol macromer that has been modified with sulfonate groups (1,2). The microspheres are stored in phosphate packing solution and when admixed with a solution of doxorubicin the chemotherapeutic is incorporated in the bead.

Preclinical studies with DC Bead™ demonstrate a sustained continuous release of doxorubicin for a period of 14 days after injection (1,3). Additionally, it has been shown that the systemic plasma concentration of doxorubicin was significantly lower than when injected intraarterially without the DC Bead™ (3). The rate of elution of doxorubicin at the tumour depends on the osmolality of the tumour and the size of the injected beads (the larger the beads the slower the local release) (2). These correlations were also proved in preclinical animal studies (9) and in recent studies with pigs (4).

The beads present a maximum loading capacity with doxorubicin that reaches 45 mg/mL of hydrated beads to maintain the controlled local release and avoid overflow to the systemic circulation (2). Lewis et al also found that the greater the osmolality of the used solution, the less drug loading is achieved and for this reason solution preparation instructions should be meticulously kept (8). Although DC Bead is stable to higher concentrations the safety and efficacy range is 25 to 37.5 mg/ mL of doxorubicin with a maximum recommended life dose of 450mg/m of body surface area to avoid cardiac toxicity (1,2).

Increased tumour concentration and low peripheral blood levels are desirable to achieve good results and minimum toxicity. In their recent animal study Lewis et al found that higher peripheral concentrations may occur with smaller bead diameters (4).
Pharmakokinetic studies in a Vx-2 animal model showed that plasma concentration of doxorubicin was minimal after embolization suggesting tumor retention of the drug when compared with control animals treated with doxorubicin intraarterially (3). Within the tumor, doxorubicin concentration reached a peak at 3 days post embolization remaining high for 7 days before declining that was seen at 14 days. In a most recent clinical study using doxorubicin loaded DC Bead concentration in the peripheral blood was significantly lower compared with the conventional TACE (p=0.00002) (5).

These properties of DC Beads are not present in other embolization material used in chemoembolization; as shown in other studies polyvinyl alcohol particles or the gelatine coated tris-acryl embospheres do not have the capability to transfer doxorubicin molecules inside them and in addition suspensions are unstable 6. In vitro measurements have also shown that when lipiodol was used as a doxorubicin carrier (like in conventional TACE) local release was very rapid (2).

Antitumoral effect
Initial in vivo studies in a rabbit Vx-2 model showed that at concentrations per liver weight planned for clinical trials the concentration of doxorubicin in the peripheral blood was low and that the fraction of non viable tumour was higher compared to the intraarterial injection (1,3). In addition, in the same model Hong et al found that intratumoral doxorubicin levels at 72 hours after embolization were about 400% higher to that of conventional TACE (3).
Imaging and pathological correlations in an animal series with Yucatan pigs in which blunt beads and doxorubicin eluting beads were compared it was found that necrosis was more profound and severe with the DC Beads (2,4).Tumor necrosis was greatest 7 to 14 days after treatment while for this period the combined damaged and necrotic cells approached 100%. Comparing with necrosis induced in controls with IA injection of doxorubicin followed by embolization with unloaded DC Bead there was a statistically significant advantage with the loaded beads. In the animal study of Hong et al tumour necrosis in the Vx-2 animal model approached 100% at 7 days while plasma concentration of doxorubicin was minimal (3).

Clinical results of DC Bead
Varela et al in their recent study with doxorubicin loaded beads in 27 patients with cirrhosis related HCC and large multifocal HCC observed a response rate of 75% (66.6% on intention-to-treat) (11). Doxorubicin with a 1 and 2 year survival rates of 92.5% and 88.9% respectively (5). Like wise, in another report objective response ranging from 66.2% to 85.5% across sequential treatments, while survival rates at 12 months was 97.05% (7). Survival at 18 and 24 months was 94.1% and 91.1%. A-Fetoprotein levels showed a mean decrease of 1123ng/ml.

Liver function
In their recent study Varela et al showed that the treatment was well tolerated without impairement of the liver function (5). Likewise in another clinical registry (7) transient liver enzyme increase was reported with return to baseline at one month post each procedure. Bilirubin levels remained relatively constant, with no statistically significant changes compared to baseline.

Complications
The most commonly reported complications include cholocystitis and liver abscess. In the study of Varela et al two cases of liver abscess were observed out of 27 patients, one of which was lethal (11). Others report procedure-related mortality of 0%(7). In the same study all patients suffered from post embolization syndrome. Serious complications including liver abscess and cholocystitis developed in 3.2 % of their patients (7). They also reported the development of pleural effusion in one patient (7).

Conclusions from the Athens Registry
Clinical results show that doxorubicin eluting DC Bead presents high percentages of necrosis and tumour response in short term follow-up. Randomised trials of DC Bead TACE and conventional TACE are currently being performed to reach solid conclusions. Long term follow up is necessary for the existing DC Bead registries to define long term survival rates, recurrence free time length, and percentage of new lesions occurring in non-embolized areas of the liver.

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GE Healthcare

Symposium at CIRSE 2007

Impact of MDCT on Radiology Practice: Balancing the Benefits and Risks

Date Monday 10 September 2007
Time 11:30 – 12:30
Venue Megaron Congress Centre, Skalkotas Hall

Scientific Programme

11:30 Chairman's welcome
Riccardo Lencioni, MD *Pisa, Italy*

11:35 Contemporary Issues in CTA and Tips for Improving Diagnostic Accuracy
Elliot K Fishman, MD *Baltimore, Maryland, USA*

12:00 Practical Techniques to Minimise the Risk of CIN in the High-risk Patient
Mark Downes, MD *Canterbury, Kent, UK*

12:20 Summary and Q&A
Riccardo Lencioni, MD *Pisa, Italy*

Chairman
Riccardo Lencioni, MD
Pisa, Italy

Speaker
Elliot K Fishman, MD
Baltimore, Maryland, USA

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What's the matter with uncomplicated type B aortic dissection – endografts, INSTEAD, or silent threat?

Christoph A. Nienaber
Professor at the Dept. of Cardiology
University of Rostock
Germany

Don't miss it !
Thoracic aorta stenting
Special Session 1401
Monday, September 10, 8:30-9:30
Room D

Aortic dissection is the most frequent acute aortic condition with an incidence of 3 to 4 per 100,000 person years (1-3). Although the traditional approach has focused on surgical and medical intervention, several studies in the late 20th century demonstrated the efficacy of endovascular repair in the management of this disease (4,5). Bolstered by a high technical success rate and improved morbidity and mortality relative to its surgical counterpart, endovascular repair has become a first-line treatment for aortic dissection.

Despite this trend, the debate over the optimal approach to uncomplicated type B dissection is more contentious. As recently as 2005, the consensus remained in support of medic therapy tailored for tight control of hypertension (6,7). However, the poor long-term results of this regimen with up to 50% mortality at 5 years have shifted attention to endovascular stent-grafting as a potential alternative (8), although the heterogeneity of aortic dissection undoubtedly lends itself even to integrated medical, surgical and endovascular approaches.

Despite improving surgical techniques, open resection of dissected aortic wall remains associated with excessive collateral damage, with morbidity and mortality ranging up to 27% in elective procedures and beyond 50% in complicated dissection under emergency conditions of commando operations (1). Moreover, according to current guidelines, and considering the lessons learned on collateral damage, there is little debate that type B dissection should not be subjected initially to aggressive medical treatment, which should initially include tight blood pressure adjustment and close follow-up monitoring, while relegating open surgery only to newly evolving complications after initial aggressive attempts of medical management (3, 9-11).

With the evolution and introduction of the stent graft, however, a new endovascular weapon has become an attractive alternative to traumatizing open surgery, with a markedly lower rate of neurologic and other adverse events, obviously less collateral damage, and proven feasibility to reconstruct a dissected thoracic aorta (7). Finally, the potential to treat complications such as impending rupture and distal malperfusion by sealing proximal thoracic entries with a stent graft and virtually remodeling the aorta has been convincingly demonstrated (11-15).

As described previously, rapid intervention in the acute phase is also associated with its own complications as the adventitia and dissection flap are weak and vulnerable to injury induced by placement of a stent-graft. Various groups have argued for greater than 1 week to 1 month elapsed time prior to intervention (16,17). Interstingly, the inclusion criteria of the INSTEAD trial (discussed below) require intervention between 2 and 52 weeks thereby rendering the possibility that this study may shed light on the subject. While it is probable that the optimal time for intervention lies in the subacute phase, the exact timing should give deference to the patient's underlying morbidities and the specific anatomical considerations of the dissection.

In a world of increasing availability of stent grafts (although not at all designed for treatment of dissection) and in the face of conflicting outcome data for type B dissection, ranging from an annual death attrition rate of 10% (18) under ideal conditions to more than 30% in the real world (19-21), the clear view of stent grafts as solely a better alternative to open surgery gets blurred, with "prophylactic scaffolding by a stent graft" as a real option in the anticipation to avoid future complications of dissection such as false lumen aneurysm, true lumen collapse and late rupture.

But seriously, is such "benevolentia" a viable therapeutic option with beneficial outcomes at present? And do we have scientific data to support prophylactic stent graft remodeling in patients who are carried over to a stable clinical course? And can we really prevent so-called late complications?

Even the enthusiasts in the community have difficulty coming up with solid data, which in turn underlines the need for randomized scientific trials and not just reports of registries or small single-centre series (22-24). The idea of prophylactic scaffolding, with induction of healing rather than repair and patch-up of problems is indeed intriguing and should be tested with scrutiny, because the results will be so important and far reaching.

The INSTEAD Trial

The European INSTEAD trial is a 7 centre, prospective randomized trial investigating the use of stent-grafts with adjunctive medical therapy versus medical therapy alone in patients with uncomplicated type B aortic dissections. Although limited by the exclusive use of the Medtronic TalentTM stent-graft, this trial is the most comprehensive study to date evaluating the use of stent-grafts in this population. 136 patients were enrolled in the study and followed at 3, 12, and 24 months intervals. Patients must have an uncomplicated type B dissection with a patent false lumen older than 14 days and less than 52 weeks, since dissections less than 2 weeks of age often thrombose spontaneously, thus conferring a better prognosis, while those older than 52 weeks are less amenable to intervention secondary to a thickened, fibrotic dissection flap (8).

Preliminary data presented by Dr. Christoph Nienaber demonstrated a near 100% success rate with respect to closure of the tear entry (1 patient failure) and no intraprocedural mortality. True lumen enlargement occurred in 92% and reduction of the false lumen in 63% of patients. Although 16% of patients in the stent-graft arm experienced overall aortic expansion of more than 5 mm, none required surgical or endovascular revision prior to discharge. At 6 months there were 5 deaths in the stent-graft arm, but only two attributable to dissection or other aortic complications, and 2 deaths in the medical therapy group. At 6 months, 62% of patients had total thrombosis of the false lumen, while 27% had partial thrombosis.

It is likely that a greater difference between the stent-graft and medical therapy patient subsets will become evident when data is analyzed from the 12 and 24 months interval. Interestingly, however, and although endovascular technology has been available for almost a decade, no truly dissection-specific device has seen the light of day. It is easily conceivable that dissection requires devices different from those made for a true aneurysm, with optional tapering, a bare and graft segment combination allowing for side branch jailing and maximum conformability and flexibility.

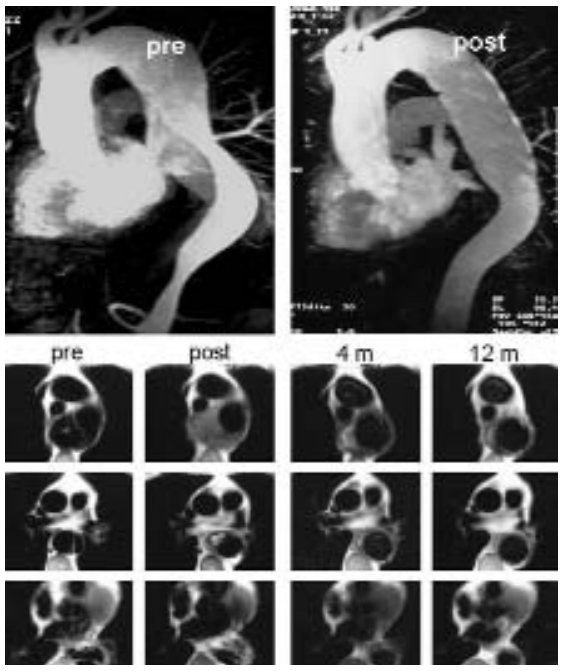

Fig. 1: Uncomplicated type B aortic dissection without false lumen expansion or malperfusion before (upper left) and after stentgraft sealing of proximal entries (upper right). Within 12 months after successful scaffolding the entire aorta even below the stented segment reveals lumen reconstruction and remodeling

Human-centred design of disease-specific components should be in the centre of our thoughts with regards to treating dissection, and the aortic arch may certainly not be the limit. Moreover, biologic and anatomic differences between individuals need to be addressed with vascular endografts just like with endoprothesis engineered to replace a lost limb. Similarly, the motion for customization of disease-specific endografts at the same time requires more operative skills from the endotherapist, vascular interventionalists or the interventional cardiologist. Especially for elective, presently uncomplicated, or silent aortic dissection, medical ethics demand an intervention with almost zero operational complications to be justified (24). Advanced interventional skills and a professional interdisciplinary setting with all imaging options, however, may only be available in specialized referral centres functioning as a core in a wider referral and allocation network.

Few recent scientific contributions have paved the way to the current question of how much collateral damage to accept for prophylactic scaffolding in aortic dissection as a higher goal; interestingly INSTEAD as the only randomized trial so far showed that the diplomatic effort of careful medical management appears to be a viable option and primary strategy for uncomplicated type B dissection with deferred endovascular intervention and stent-grafts as an option for targets failing to respond to tailored medical management (with evidence of progressive false lumen diameter or late malperfusion syndrome).

The exact role of endovascular therapy in this setting will be elucidated as the results from the INSTEAD trial and future randomized trials come to fruition. It is conceivable that as this new role is validated, conventional surgery's role will be relegated to those cases subsequently complicated by failure of thrombosis of the false lumen and persistent communication between the true and false lumen. Facing the potentially life-threatening condition of silent dissection, we as responsible physicians are to adopt the dramatic role of political leadership in the "cold war" that is silent "uncomplicated dissection". We must exercise diplomacy (or medical management) as prudently and long as possible and wait until the cold war heats up (with complications) before shooting one or two endografts.

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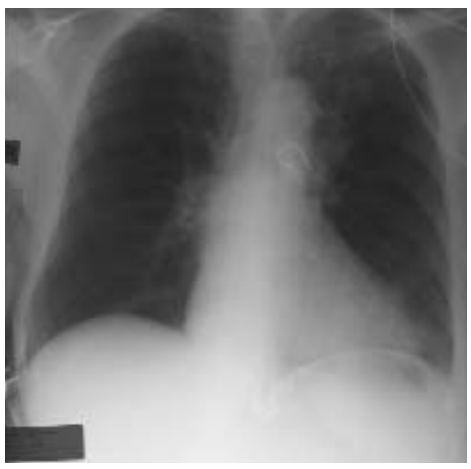
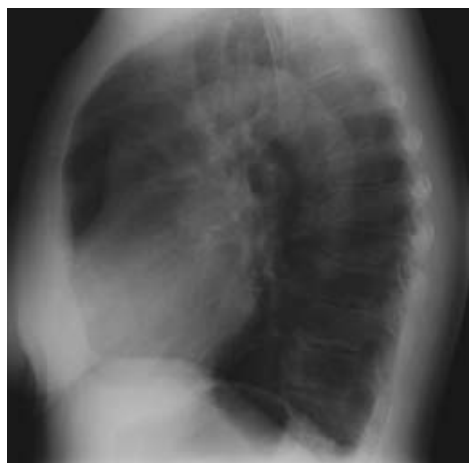
Film Interpretation Panel

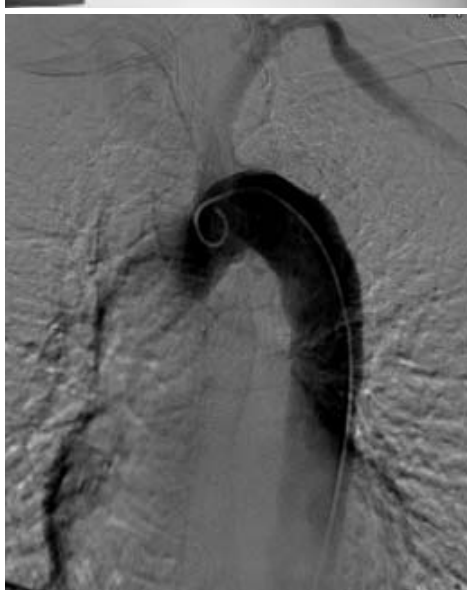
Case 5

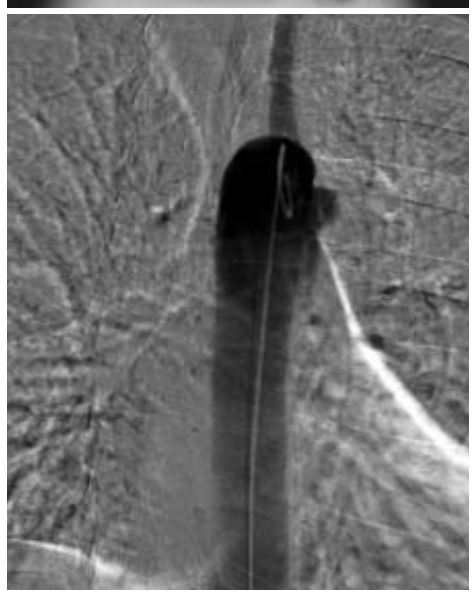
Patient History

- 76 year old female with progressive haemoptysis for 3 days
- No fever
- No medical history
- Angiography was requested

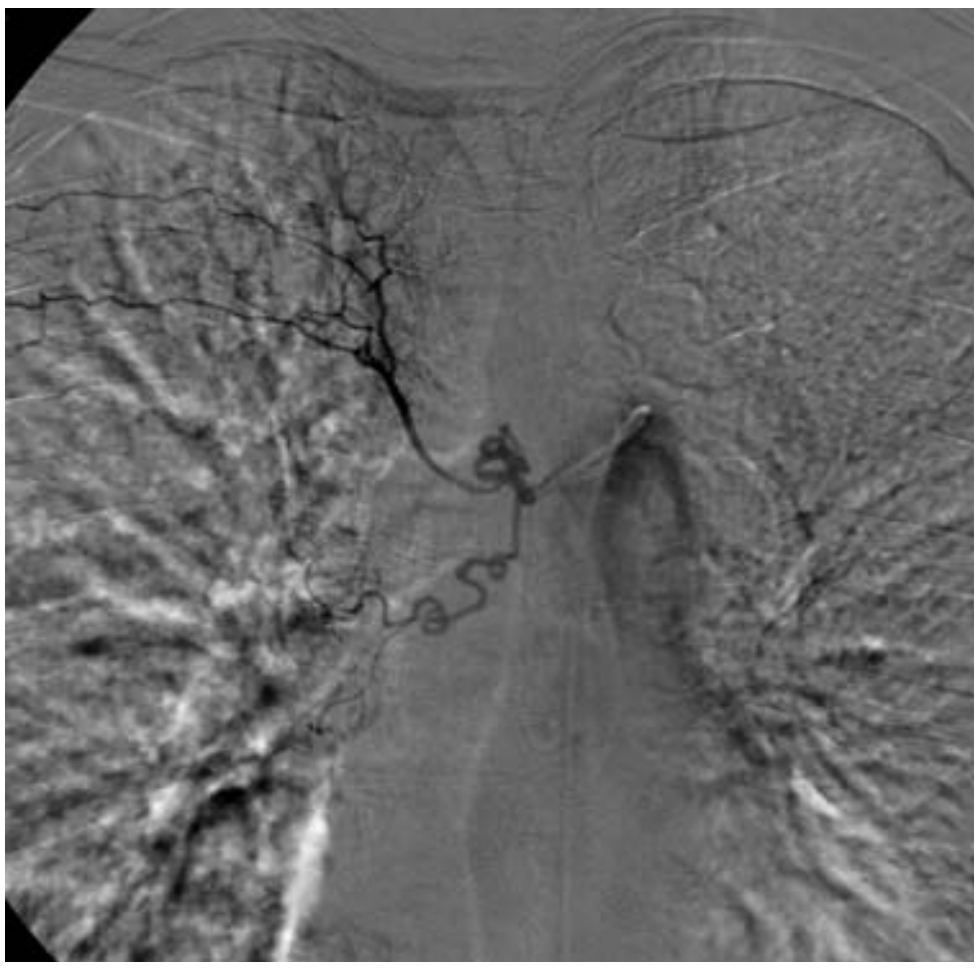








Left bronchial artery also normal



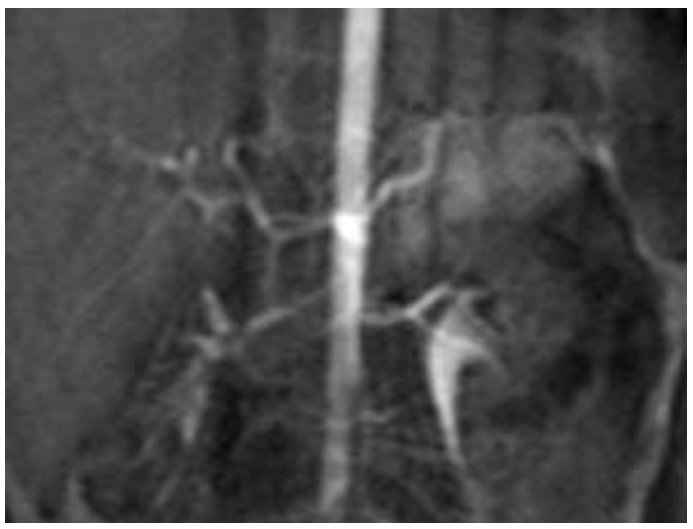
What is your diagnosis?

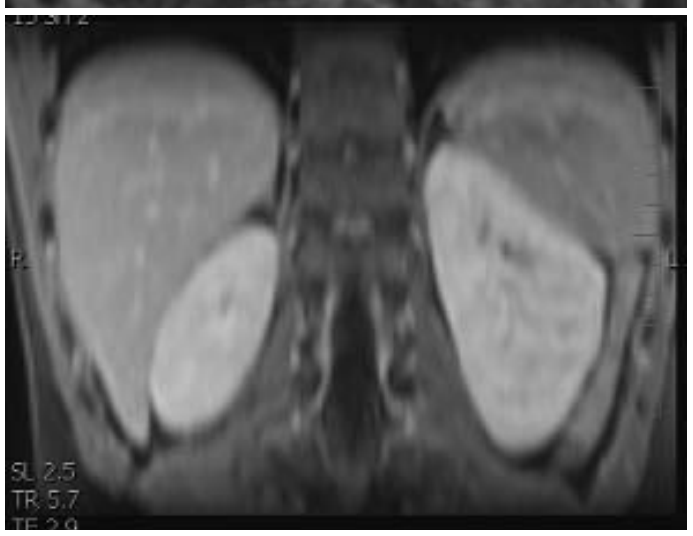
Join us to witness the fight of Gods versus Heroes today at 3pm. For those of you who like to get a head start we have put together this year's cases.

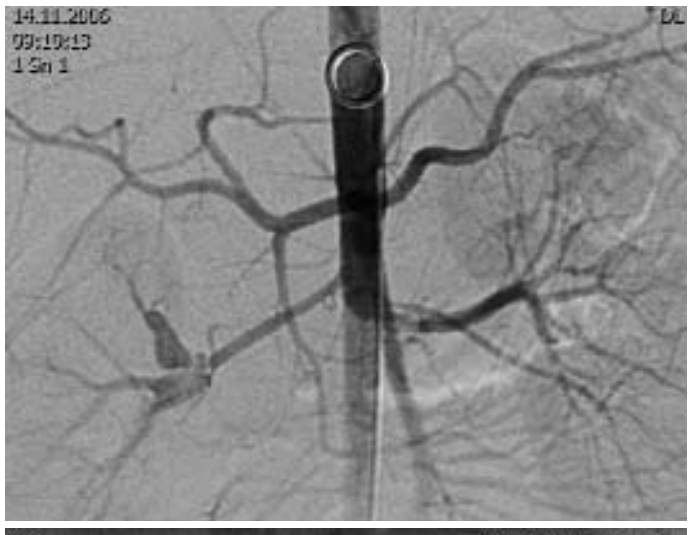
Case 6

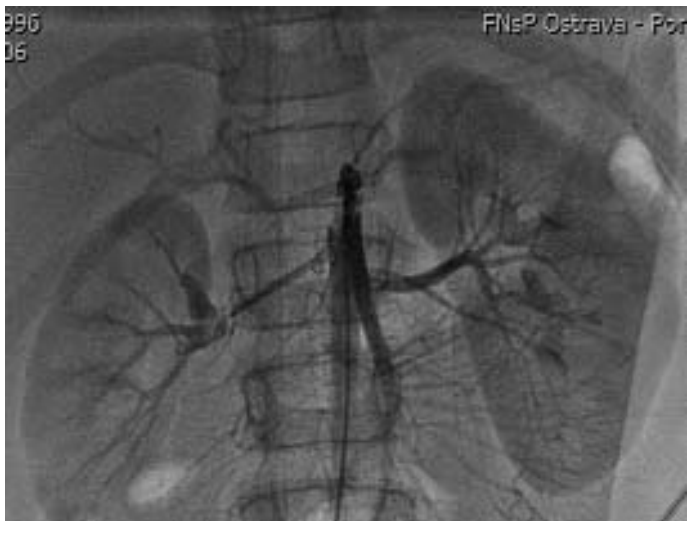
Patient History

- 11 year old boy
- Uncontrollable hypertension
- CVA during hypertension crisis
- All kind of hormone active tumors ruled out
- US: smaller RT kidney, arterial evaluation not conclusive









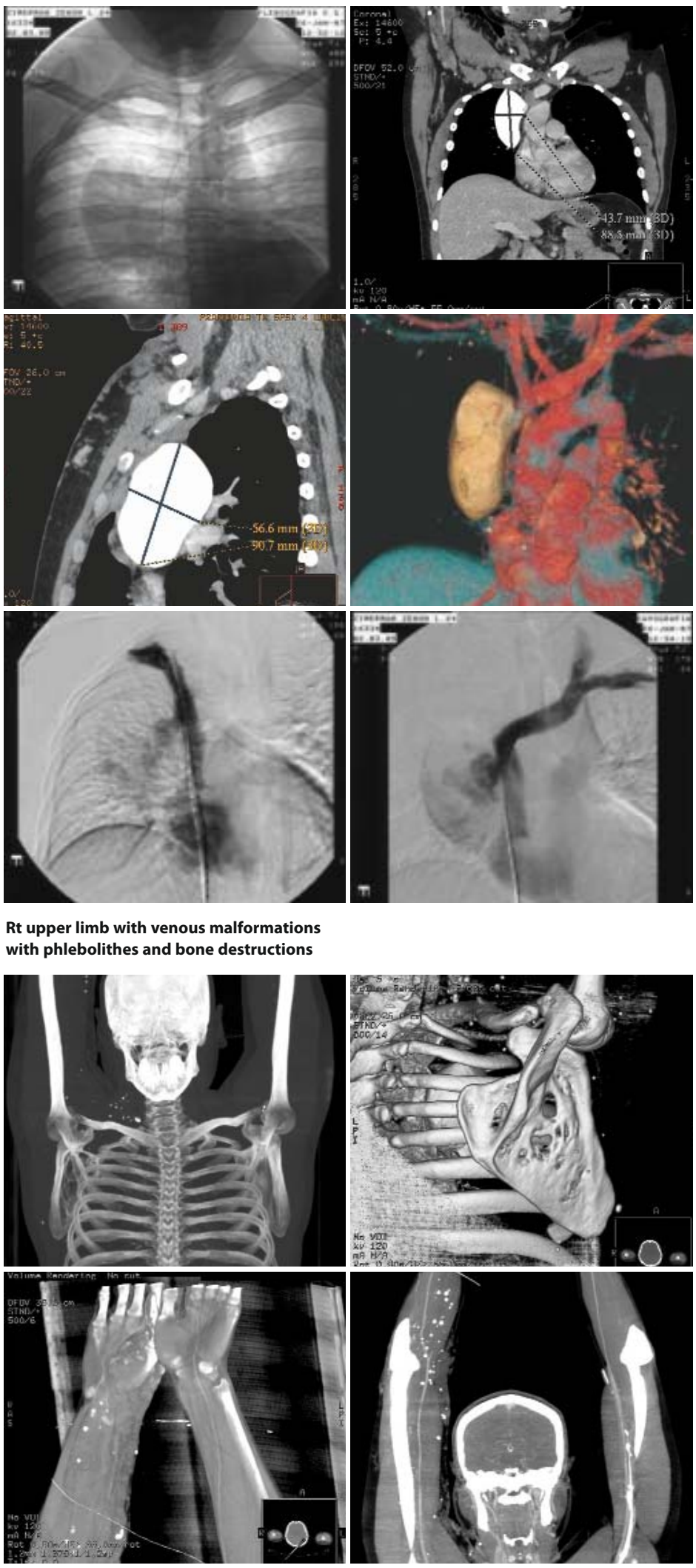
What is your diagnosis?

Gods vs. Heroes
Today, 15:00, Room A (Trianti Hall)

Case 7

Patient History

- 25 year old male
- Mediastinal mass 5 x 9 cm
- No symptoms
- Rt upper limb with venous malformations



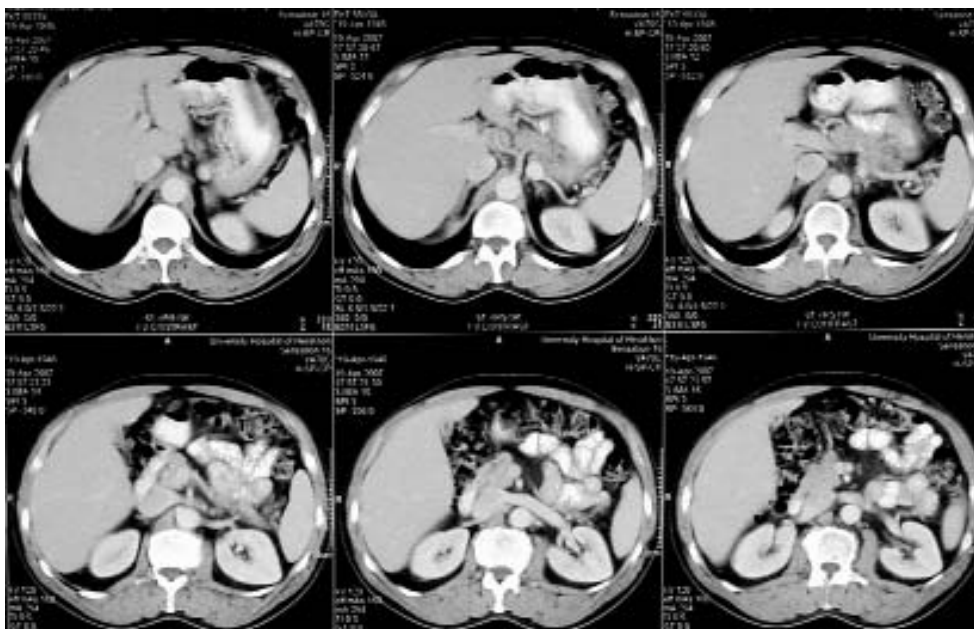
Rt upper limb with venous malformations with phlebolithes and bone destructions

What is your diagnosis?

Case 8

Patient History

- Male patient, 61 years old
- Peripheral atheromatic disease
- CT scan for abdominal pain



What is your diagnosis?

Greek Gods against Heroes

Adam Hatzidakis
Professor at the Department of Radiology
University Hospital of Heraklion
Crete, Greece
Organiser of this year's Film Interpretation Panel

In honour of this year's host country, the CIRSE 2007 Film Interpretation Panel will be under the theme of "Greek gods against heroes". Needless to say that it will be presented by Zeus, king of the gods. We invite all CIRSE 2007 participants to join us today at 3 pm in the Trianti Hall (Room A), as the fight between gods and heroes unfolds.

There will be four groups of participants: Diana vs. Heracles, Apollo vs. Icarus, Haephestus vs. Prometheus and Poseidon vs. Odysseus. As you will see below, this is not coincidental, as these couples have somewhat of a pre-history. There is also a connection between the mythological figures and the origin of the quiz participants. Diana and Heracles are both English, as the English are well-known for their love of hunting. Apollo and Icarus are French, because one of the last French kings thought to be the Sun God himself. Haephestus and Prometheus are German, because Germany claims to be the iron power in Europe. Finally there is an American Poseidon, who crossed the Atlantic to be with us today and an Italian who is (or thinks he is) as clever as Odysseus. The correct answers will be provided by the most reliable of all sources, the Delphic Oracle.

For those of you who are not familiar with the gods and super heroes, here is a short introduction.

Zeus Δίας (Ζεύς)

In Greek mythology Zeus is the King of Gods, Ruler of Mount Olympus and God of the Sky and Thunder. His symbols are the thunderbolt, the eagle, the bull and the oak. Zeus is frequently portrayed by Greek artists in one of two poses: striding forward, a thunderbolt levelled in his raised right hand, or seated in majesty. The son of Cronus and Rhea, he was the youngest of his siblings. He was married to Hera in most traditions, although at the oracle of Dodona his consort was Dione. According to the Iliad, he is the father of Aphrodite by Dione. He is known for his erotic escapades, including one pederastic relationship with Ganymede. His trysts resulted in many famous offsprings, including Athena, Apollo and Artemis, Hermes, Persephone (by Demeter), Dionysus, Perseus, Heracles, Helen, Minos, and the Muses (by Mnemosyne). By Hera he is usually said to have sired Ares, Hebe and Hephaestus. His Roman counterpart is Jupiter.

The Delphic Oracle Πυθεία

Oracle (latin oraculum, greek manteion) is the site but also the holy temple where somebody asks a God a question and waits for an answer. In ancient Greece the Oracles were very important, the most famous of them being the Oracle of Apollo in Delphi. All kinds of questions were asked, such as where new cities should be founded or if wars should be started. The Pytheia was a woman, who was sitting in the Temple and being in a semi-sedated situation, was Apollo's instrument in order to answer the question.

Most of the times, the answer given was not easy to be understood, so in many cases the person who asked had to find the exact meaning himself. For example, when Byzas from Megara asked the Oracle where to build a new Megara-colony, the Oracle answered "opposite to the land of the blind". Since Byzas did not know such a land, he started sailing and as soon as he was in Bosporus and saw the beautiful but also very strategic European side of it, asked if anybody was living there. When they told him that there was a city on the other side on the Asian part of Bosporus, he asked "are these people blind not to live on this side". So he understood that this was what the Oracle had meant, built his city there and named it Byzance.

Diana Ἄρτεμις

In Greek mythology, Artemis (Diana) was the daughter of Zeus and Leto and the twin sister of Apollo. She was usually depicted as the maiden goddess of the hunt, bearing a bow and arrows. Later she became associated to the moon, as her brother was to the sun. She was one of the most widely venerated gods and manifestly one of the oldest deities. In later times she was associated and considered synonymous with the Roman goddess Diana. In Etruscan mythology, she took the form of Artume. Deer and cypress are sacred to her.

Heracles Ηρακλής

In Greek mythology, Heracles or Herakles ("glory of Hera") was a divine hero, the son of Zeus and Alcmene, and great-grandson (and half-brother) of Perseus. He was the greatest of the Greek heroes, a paragon of masculinity, the ancestor of royal clans who claimed to be Heracleidae and a champion of the Olympian order against chthonic monsters. In Rome and the modern West, he is known as Hercules. The Romans adopted the Greek version of his life and works essentially unchanged, but added anecdotal detail of their own, some of it linking the hero with the geography of the Central Mediterranean. Details of his cult were adapted to Rome as well. Extraordinary strength, courage, ingenuity, and sexual prowess with both males and females were among his characteristic attributes.

Although he was not as clever as the likes of Odysseus or Nestor, Heracles used his wits on several occasions when his strength did not suffice, such as when labouring for King Augeias, wrestling the giant Antaeus, or tricking Atlas into taking the sky back onto his shoulders. His iconographic attributes are the lion skin and the club. These qualities did not prevent him from being regarded as a playful figure who used games to relax from his labors and played a great deal with children. By conquering dangerous archaic forces he is said to have "made the world safe for mankind" and to be its benefactor.

Hercules had a lot of problems with women, whether they were mortal or goddesses. Hera, Hercules' step mother, hated him and set in motion the events which led to his 12 labours. Athena helped him several times but threw a stone at him when he tried to kill his son Amphitrion. Diana, the archetype of femininity did not have an easy time with men either. She often punished men for raping women. Diana, protector of animals and goddess of hunting, went mad with Hercules when he hunted her pet deer, the hind of Ceryneia.

This special deer with golden horns and hoofs of bronze belonged to Diana, which is why they are often depicted together in art. Hercules was instructed by Eurystheus to go fetch the hind and bring it back to Mycenae. Hercules set out on this adventure, and hunted the deer for a whole year. He finally succeeded by shooting the deer, but it was still alive and he took it back to Mycenae. Diana together with her brother Apollo met him on the way and was about to take the deer away from him, and surely she would have punished him, but Hercules told her the truth. He said that he had to obey the oracle and do the labours Eurystheus had given him. Diana let go of her anger and healed the deer's wound when Hercules promised that after he carried it alive to Mycenae he would bring it back to her.

Apollo Ἀπόλλων

In Greek and Roman mythology, Apollo, the ideal of the kouros (a beardless youth), was the archer-god of medicine and healing, light, truth and archery. As the patron of Delphi, Apollo was an oracular god. He was the prophetic deity of the Delphic Oracle, as well as one of the most important and many-sided of the Olympian deities. Apollo also had dominion over colonists, over medicine and was the patron defender of herds and flocks. As the leader of the Muses and director of their choir, he was also the god of music and poetry. Apollo was the son of Zeus and Leto, and the twin brother of the chaste huntress Artemis, who took the place of Selene in some myths as goddess of the moon. Apollo is known in Greek-influenced Etruscan mythology as Apulu. In Roman mythology he was known as Apollo and became increasingly associated with Sol, the Sun. In Hellenistic times, Apollo became conflated with Helios, god of the sun, and his sister similarly equated with Selene, goddess of the moon. However, Apollo and Helios remained separate beings in literary and mythological texts.

Ikarus Ἴκαρος

In Greek mythology, Icarus was the son of the artificer Daedalus. Icarus was famous for his death by falling into the Icarian Sea near Icaria, the island southwest of Samos that still bears his name, when he flew too close to the sun, melting the wax holding his artificial wings together. His plight was routinely alluded to by Greek poets in passing, but was told in a nutshell in Pseudo-Apollodorus. Hellenistic writers who provided philosophical underpinnings to the myth also preferred more realistic variants, in which the escape from Crete was actually by boat, provided by Pasiphaë, for which Daedalus invented the first sails, to outstrip Minos' pursuing galleys, and that Icarus fell overboard en route for Sicily and drowned. Heracles erected a tomb for him.

Icarus' father, Daedalus, the talented architect of the Minoan labyrinth, lost the favour of king Minos when he revealed the mystery of the Labyrinth to Ariadne, and was imprisoned in a dungeon. He managed to escape from his prison, but could not leave the island by sea, as the king kept strict watch on all ports. Daedalus therefore started to fabricate wings for himself and his young son. He wrought feathers together forming an increasing surface. The larger ones he secured with thread and the smaller with wax, and gave them a gentle curvature like the wings of a bird. Then rising on his wings, he flew off, encouraging Icarus to follow, and looked back from his own flight to see how his son managed his wings. As they were flying, the people below thought they were gods.
They flew for hours when Icarus, exulting in his career, began to leave the guidance of his father and soar upward as if to reach the sun. This really elicited Apollo's wrath who let the blazing sun melt the wax which held the feathers together, and they came off. Icarus fluttered with his arms, but no feathers remained to hold the air. He fell to his death drowning in the sea which until now is called Icarian Sea. Hercules who passed by gave him a burial. Daedalus arrived safe in Sicily, where he built a temple to Apollo, and as an offering to the God hung up his wings.

Hephestus Ἥφαιστος

Hephaestus was the Greek god whose Roman equivalent was Vulcan; he was the god of technology, blacksmiths, craftsmen, artisans, sculptors, metals and metallurgy and fire. He was worshipped in all the manufacturing and industrial centers of Greece, especially Athens. Though his forge traditionally lay in the heart of Lemnos, Hephaestus was quickly identified by Greek colonists in southern Italy with the volcano gods Adranus of Mount Etna and Vulcanus of the Lipara islands, and his forge was moved there here by the poets. The first-century sage Apollonius of Tyana is said to have observed "there are many other mountains all over the earth that are on fire, and yet we should never be done with it if we assigned to them giants and gods like Hephaestus".

Hephaestus, the only god who was a legitimate son of Zeus and his wife Hera, nothing to do with the fact that he was grotesquely ugly and lame, was the god of fire. He was married to beautiful Aphrodite who bore a lot of children, alas none of which had Hephaestus as father. Prometheus, on the other hand, was a titan, surpassing all other titans in cunning and deceit. He was known for his disrespect to the gods, including Zeus whom he often ridiculed, but Zeus favoured him for his help in fighting Cronus, the king god before the time of the Olympians.

Prometheus Προμηθεύς

In Greek mythology, Prometheus is credited with the creation of men from clay, giving them the shape of the gods. Zeus was angered and forbade him from teaching man the ways of civiliation. Feeling sorry for his creation, Prometheus decided to steal fire from Hephaestus' volcanic forge and tought men to cook and stay warm. Irritated in an extraordinary degree, Hephaestus persuaded Zeus to punish Prometheus for this hubris. He then carried him to Mount Caucasus where he was chained, where an eagle would daily pick at his liver in eternity. Finally, a few thousand years later, Hercules freed Prometheus, and Hephaestus agreeing that he was punished enough, accepted him to sit next to him among the other Olympians.

Don't miss it !

Film Interpretation Panel
Gods vs. Heroes
Monday, September 10, 15:00-16:00
Room A (Trianti Hall)

Poseidon Ποσειδώνας

In Greek mythology, Poseidon was the god of the sea, as well as of horses and, as "Earth-Shaker," of earthquakes. The sea gods Rodon in Illyrian mythology, Nethuns in Etruscan, and Neptune in Roman mythology were sea gods analogous to Poseidon. Poseidon was related to Zeus, Hera and their numerous children.

Odysseus Οδυσσέας

Odysseus or Ulysses is the main hero in Homer's epic poem the Odyssey and plays a key role in Homer's Iliad. King of Ithaca, husband of Penelope, father of Telemachus, Odysseus is renowned for his guile and resourcefulness and is most famous for the ten eventful years it took him to return home after the Trojan War. Ithaca, an island along the Ionian coastline of Greece, is one of several islands that would have comprised the realm of Odysseus' family, but the true extent of the Cephallenian realm and the actual identities of the islands named in Homer's works are unknown.

Poseidon, son of Cronos and brother of Zeus was one of the first Olympian gods. His mission was to give voice to the earth. He pounded and shook the earth and sea with his wrath and his domain was the vast sea which he populated with creatures of his own design. Odysseus was a mortal but clever and treacherously guile figure of greek mythology, king of Ithaca and the most influential Greek champion during the Trojan war, credited with the stratagem of the Trojan horse. On his way back home he landed on the island of the Cyclopes. In search for supplies he and his men entered a cave which was Polyphemus' home. Polyphemus, one of the sons of Poseidon, returned to his cave only to find Odysseus and his men pestering with his belongings. He blocked to entrance with a stone and devoured some of the men. Odysseus devised an escape plan by giving him a lot of wine to drink. When the cyclops had fallen asleep, Odysseus and his men sprang upon him with a sharpened burning club driving it into his eye.

Poseidon did not forgive this indignity visited upon his son. His wrath caused Odysseus an epic punishment in that he would thwart his return home to his family and happiness. He staggered the seas and let loose of the storm blasts against Odysseus ships driving him for ten years around the world. After that Poseidon turned away from the long-suffering Odysseus who was allowed to make his way to his palace and wife Penelope.

Greek Heroes – Part II

by Petra Mann
CIRSE Office

Odysseus –

Just why do men refuse to ask for directions?

When leaving Troy to sail back to his homeland of Ithaca after the Trojan War, Odysseus should have brought a map or at least stopped somewhere to ask for directions, as it took him ten years to get home. He probably realized that a couple of years into his odyssey, but was too embarrassed to admit that he was lost and just kept going (you really have to wonder why they call him the cunning). Obviously bored from the long trip, Odysseus and his men would hop off their ship once in a while to start wars, fight monsters or do other things to stretch their legs.

When at some point during his journey Odysseus came to an island full of gigantic things, he did not take off like most people would, but stuck around to see just why all the stuff was so big (again the word cunning is not the first one to come to mind). Together with his men he entered a cave and was surprised to see that the giant stuff belonged to a Cyclops named Polyphemus. Rather than offering his guests some refreshments, Polyphemus decided to eat them and started right away with a couple of Odysseus' men.

When Polyphemus left the cave the next morning Odysseus decided that being digested by a Cyclops was not the kind of heroic death he had envisioned for himself and concocted a plan; when Polyphemus returned to his cave Odysseus poked out his eye with a sharpened stick. The next morning Odysseus and his men managed to escape from the cage by clinging onto the bellies of Polyphemus' sheep. What Odysseus did not know was that Polyphemus was Poseidon's son and if there is one rule in navigation you want to stick to, it is Do not mess with the God of the Seas!

After his adventure with the Cyclops Odysseus landed on the island of a witch by the name of Circe (Circe spelled with a c, mind you). She did not turn out to be the world's greatest host either, as she turned all of Odysseus' men into pigs. When Odysseus threatened to kill her she immediately fell in love with him (?!) and released his men from the spell. Although they were not the brightest and kept getting Odysseus into trouble, it must be said that his men were very forgiving people, as they did not seem to mind Circe's little prank and stayed in her house for a whole year.

After a bunch of further adventures Odysseus finally arrived in Ithaca. Since he had been gone for 20 years (and he said he was only stepping out to get some cigarettes!), he found his house full of suitors trying to get busy with his wife. Most people would have simply told them to leave, but of course that wouldn't make for a good story, which is why Odysseus disguised himself as a beggar and challenged them to shoot an arrow straight through 12 rings. Of course nobody but Odysseus managed, which he celebrated ancient hero-style, i.e. by shooting his rivals.

Icarus -

Or why you should always listen to your parents

Icarus is probably Greece's most tragic hero story, as it isn't about much but the main protagonist's death. The trouble started when King Minos commissioned Icarus' father, the artificer Daedalus, to build a maze, also called the Labyrinth, for a monster by the name of Minotaur. Since Daedalus was the only one who knew how to escape from it, king Minos kept him prisoner on the island of Crete (what a nice way to thank him for a job well done).

Since Daedalus was quite a handy man, he built a set of wings of feathers glued together with wax for himself and his son. When they were finally finished Daedalus warned Icarus not to fly too close to the sun, as the heat would melt the wax and make the wings fall apart. Apparently Daedalus did not know about reverse psychology. Being a teenage boy Icarus of course would not listen to his dad and did the exact opposite, causing him to fall into the water and drown. This is why we now know the area where he died as the Icarian Sea.

Prometheus –

Now that's gotta hurt!

Prometheus was another tragic hero. A titan (early god) by trade, he created animals and humans, forming them out of mud. His brother Epimetheus was responsible for providing them with special skills or features, but had none left when Prometheus finally created man (Thanks a lot, Epimetheus!). Being a really nice guy Prometheus went to Mount Olympus to sneak some fire out from Haephestus, the god of fire and iron, and give it to the humans, hence providing them with the ability to warm their homes, forge weapons and have barbecues.

Unfortunately Zeus was not exactly delighted to find out that Prometheus had stolen the secret of fire and chained Prometheus to a rock in the Caucasus Mountains. As if this was not enough he sent an eagle to torture him by tearing out his liver every day (ouch!). His liver would regenerate overnight (which is pretty much the dream of everybody who has ever had a couple of drinks too many). Zeus finally released Prometheus after he had given up the secret of which one of Zeus' sons would eventually overthrow him and Prometheus lived happily (though slightly traumatized) ever after.

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