IR congress news

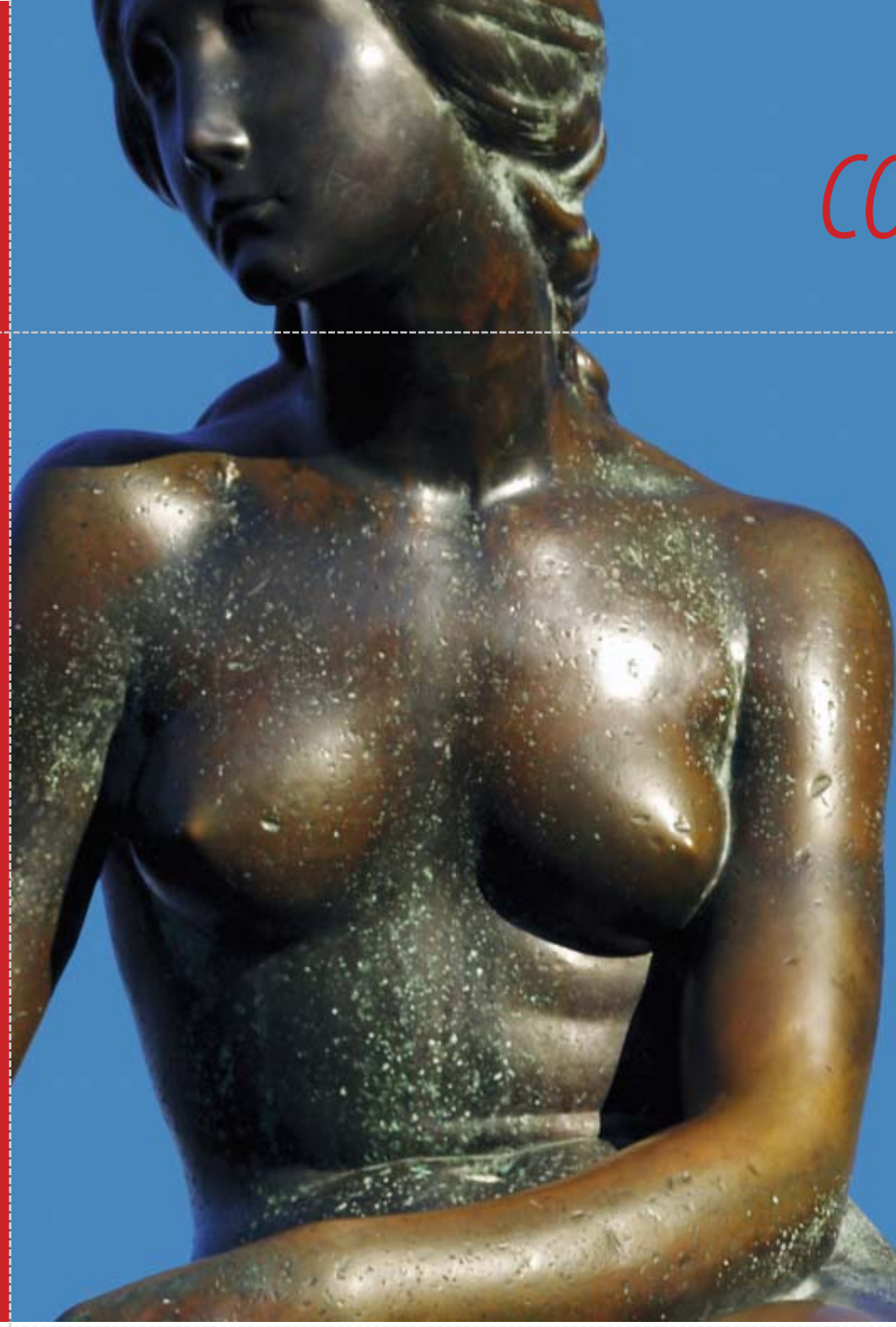
CIRSE 2008 - Copenhagen
Sunday, September 14, 2008

Andreas Gruentzig Lecture

Honouring the German radiologist Andreas Gruentzig, who first successfully developed angioplasty for expanding lumens of narrowed arteries, CIRSE's yearly Gruentzig Lecture has been given by some of the most outstanding personalities in the field of Interventional Radiology. Over the years these exceptional lectures have become one of the highlights of our meeting's scientific programme.

This year's Gruentzig Lecture will be given by Professor Christoph Becker, associate professor and section chief at the Munich University Hospital, who will speak about non-invasive cardiovascular imaging emerging into clinical applications.

We invite all of you to attend the Grunetzig Lecture which will take place today after the CIRSE meets PAIRS session at 14:30 in Room A.



Christoph R. Becker
Associate Professor and Section Chief
at Munich University Hospital, Germany
CIRSE 2008 Gruentzig Lecturer

Coronary imaging now and future perspective

Introduction
It is fairly well known that coronary heart disease is one of the leading causes of mortality, morbidity and death in developed countries. Increasing efforts have been made in screening and diagnosing coronary artery disease with different imaging modalities, such as catheter angiograph, ultrasound and MRI. For a long time the electron beam CT was the only CT modality capable of imaging the coronary arteries without any motion artifacts. Multi-detector-row CT has advanced rapidly in the last decade and 64-detector-row and dual-source CT scanners are now state of the art scanners for robust imaging of the coronary arteries, myocardium and valves with high quality in terms of morphology and even function.

Screening for coronary atherosclerosis and cardiovascular risk assessment
Coronary calcium screening is a surrogate marker for coronary atherosclerosis and has been measured by electron beam CT for more than a decade now. As electron-beam CT is a rather expensive modality, the quality adjusted life year saved (QALY) was $37,633 (1). Further studies are currently being conducted to prove the hypothesis that the assessment of coronary calcium by multi-detector-row CT is superior to the assessment of conventional risk factors to estimate the risk of cardiovascular events in the future.

Coronary artery disease as detected by coronary CT angiography
Meanwhile there are more than 41 studies performed with more than 2,500 patients comparing multi-detector-row CT with coronary angiography for the detection of coronary artery stenoses. According to these papers, a sensitivity and specificity of 96% and 76% has been reported, respectively (2). But more than only displaying the contrast-filled lumen like in cardiac catheter, CTA as a cross sectional modality also has the ability to display the coronary artery wall. Coronary atherosclerotic changes may appear as calcified, non-calcified or mixed plaques. In a recently published study Leber et al. reported that non calcified lesions were predominantly found in patients with acute myocardial infarction, whereas calcified lesions were found more often in patients with chronic stable angina (3). In patients with an acute coronary syndrome a non calcified lesion in the coronary artery may correspond to an intra-coronary thrombus (4).

Studies comparing intravascular ultrasound as the gold standard for plaque imaging with CT have shown a good correlation between the echogeneity and CT density of coronary atherosclerotic lesions (5). The sensitivity and specificity for CT to detect calcified and non-calcified coronary atherosclerosis is between 78 and 94%, respectively (6).

Future application of cardiac CT
Dual-source CT offers another potentially promising features in characterising atherosclerotic coronary plaques. If the two X-ray tubes operate at different energy levels, e.g., 140 kV and 80 kV, the datasets originating from the two detectors allow for spectroscopy-like visualisation of atherosclerotic lesions. Apart from morphology, PET/CT with F18-FDG may deliver new insights into the inflammatory activity of plaques, e.g. in the carotid arteries (7).

A second development pathway is rotating C-arm CT. The combination of catheter intervention and CT will provide a variety of new applications for invasive cardiology, such as aortic-root catheter directed coronary CT angiography (8) or time resolved 3D imaging of left atrium and pulmonary veins (9).

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Don't miss it !

Andreas Gruentzig Lecture
Sunday, 14:30-16:00
Room A

47 y/o male with ACS

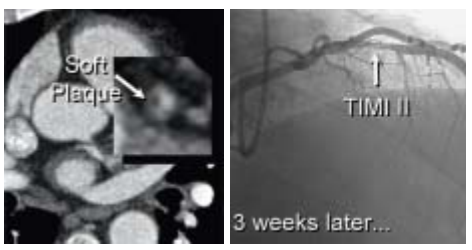

Fig.1: Lipidrich (vulnerable) plaque in the left anterior descending coronary artery as detected by coronary computed tomography (arrow left). Three weeks later the patient experienced a myocardial infarction caused by a culprit lesion at the same location (arrow right).

40 y/o male with STEMI

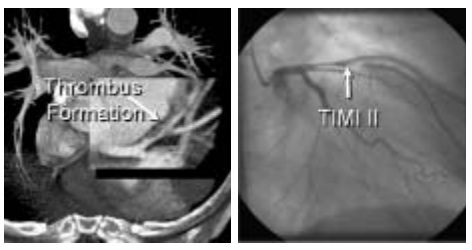

Fig.2: Thrombus formation in a patient with myocardial infarction in the left anterior descending coronary artery as seen by computed tomography (left) and coronary angiography (right).

8. Kumar A, Bis KG, Shetty A, et al. Aortic root catheter-directed coronary CT angiography in swine: coronary enhancement with minimum volume of iodinated contrast material. AJR Am J Roentgenol 2007;188:W415-22.
9. Al-Ahmad A, Wigstrom L, Sandner-Porkristl D, et al. Time-resolved three-dimensional imaging of the left atrium and pulmonary veins in the interventional suite--a comparison between multisweep gated rotational three-dimensional reconstructed fluoroscopy and multislice computed tomography. Heart Rhythm 2008;5:513-9.

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MELODIE TRIAL

Primary Endpoint

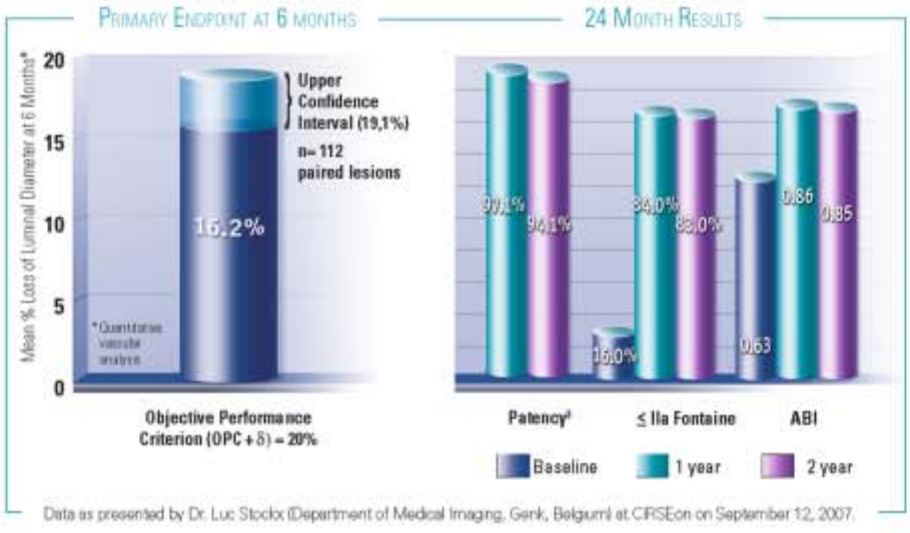
Definition

- Angiographic mean percent loss of luminal diameter at 6 month post-procedure, defined as

$$\left[\frac{\text{POST MLD}^1 - \text{FUP MLD}^2}{\text{POST MLD}}\right] \times 100$$

Outcome:

- Non-Inferiority established at 6 month with a mean percent luminal diameter loss = 16.2%



Data as presented by Dr. Luc Stoclx (Department of Medical Imaging, Genk, Belgium) at CIRSEon on September 12, 2007.

Long Term Results

- Excellent safety profile for Express™ Vascular LD with 8.9%, 10.2% TLR at 1 and 2 years and Zero device / procedure related death.
- Sustained Stent Target Lesion Patency measured by CTA with 97.2% at 1 year and 94.1% at 2 years.
- High follow-up rates at two years= 87% (Clinical), 84% (CTA).
- Continued clinical succes at 1 and 2 years as measured by ABI improvement and Fontaine stage classification.

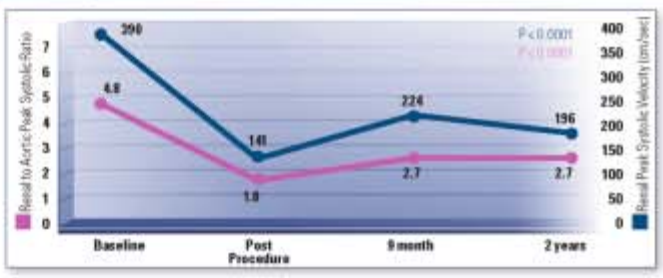
Palmaz® is a registered trademark of Cordis Corporation. 1 Post MLD = Post procedure minimum lumen diameter. 2 FUP MLD = Follow up minimum lumen diameter at 6 months. 3 Target Lesion Patency measured by CTA.

RENAISSANCE TRIAL

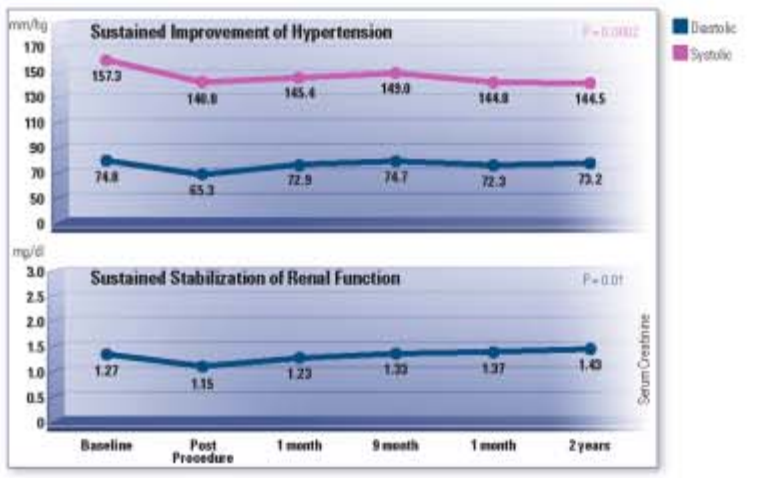
Effectiveness Measures

Succes Crossing Lesion (per Lesion)	100.0 %
Technical Succes (per Lesion)	99.1 %
Procedure Succes (per Patient)	99.0 %

Haemodynamic Improvements Sustained to 2 Years



Sustained Clinical Outcomes at 2 Years



No patient required dialysis or other renal replacement therapy during the follow-up period.

CONCLUSION

- **This study demonstrated that renal artery stenting with the Express™ Vascular SD Stent was superior, in terms of binary restenosis, to an objective performance criterion based on outcomes with balloon angioplasty alone (21.3% vs 40.0%, p<.0001).**
- **The measurements of the secondary endpoints at 2 years demonstrated an improvement in systolic blood pressure, and similar creatinine levels.**

MELODIE TRIAL

A prospective, multi-center, single arm study to obtain additional data on the safety and efficacy of the Express™ Vascular LD stent implantation in the treatment of stenosed or occlusive atherosclerotic disease (de novo or restenotic) in iliac arteries.

RENAISSANCE TRIAL

A prospective, multi-center, single arm study evaluating the Express™ renal (Express™ Vascular SD) premounted stent system in the treatment of atherosclerotic lesions in the aortorenal ostium.

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CIRSE Goes Global

CIRSE has been growing at an outstanding rate over the past years. Group Membership has significantly contributed to this development, enabling national societies to join CIRSE in their entirety at preferential conditions.

Following a global strategic plan, CIRSE offers very favourable conditions to all those national IR societies bringing in their entire membership. This has allowed many societies to join forces with CIRSE which is becoming a global network of Interventional Radiology ranging from Brazil all the way to China.

CIRSE Group Members

Corresponding and Full Members	**2,576**
Corporate Members	**24**
Applicants (Members in progress)	**1,680**
TOTAL	**4,280**

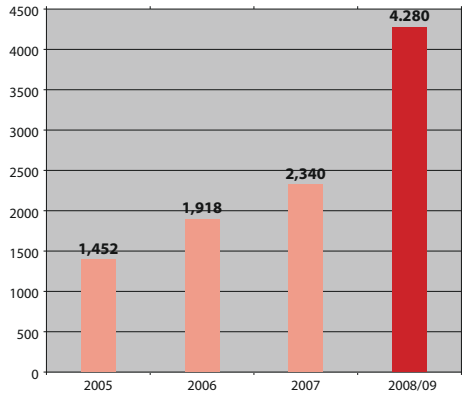
Group Members - Europe

BSIR – British Society of Interventional Radiology, www.bsir.org
Bulgarian Society of Invasive Radiology
CSIR – Czech Society of Interventional Radiology, www.csir.cz
DeGIR – German Society of Interventional Radiology, www.degir.de
DFIR – Danish Society of Interventional Radiology, www.dfir.dk
Finnish Society of Interventional Radiology
Hellenic Society of Interventional Radiology www.helrad.org
ILSIR – Israeli Society of Interventional Radiology
NGIR – Dutch Society of Interventional Radiology, www.ngir.nl
ÖGIR – Austrian Society of Interventional Radiology, www.oegir.at
PLTR – Polish Society of Interventional Radiology, www.polradiologia.org
RSIOR - Russian Society of Interventional OncoRadiology
SERVEI - Spanish Society of Vascular and Interventional Radiology, www.servei.org
SSCVIR - Swiss Society of Cardiovascular and Interventional Radiology
TGRD – Cardiovascular and Interventional Society of Turkey

Group Members - Overseas

CSIR – Chinese Society of Interventional Radiology
ESIR – Egyptian Society of Interventional Radiology, www.esir.org.eg
ISVIR – Indian Society of Vascular and Interventional Radiology, www.isvir.in
PAIRS – Pan Arab Interventional Radiology Society
SoBRICE – Brazilian Society of Interventional Radiology and Endovascular Surgery, www.sobrice.org.br

CIRSE Membership



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CIRSE gratefully thanks its Corporate Members for their support throughout the year.

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Aghiad Al-Kutoubi
Founding member and first president of PAIRS

The Pan Arab Interventional Radiology Society (PAIRS) - A brief profile

Don't miss it !
CIRSE meets PAIRS
Sunday, 14:30 - 16:00, Room A

Spanning from the Atlantic Ocean in the West to the Arabian Gulf in the East, the Arab World shares a common language and heritage. Cultural links with Europe developed in both directions throughout the centuries.

The influence of modern European medicine represents the different schools, particularly the French in the North African countries and the English in the Middle East. Consequently different practice patterns developed and merged in varied combinations.

The need for a professional society to provide a forum for interventionalists in the Arab World became clear as the specialty was expanding, facing some of the challenges and difficulties that are being experienced by colleagues all over the world. Some of the unique features of practice in the Arab countries, including health care provision, regulatory issues, availability of resources and education formed the platform for the formation of our society. The need for clearly defining the role of the interventional radiologist, cross fertilization of the various approaches, and promotion of the specialty were the driving forces behind the discussions that started in 1998 and culminated in the formation of an interim board in 2004.

The official launching of PAIRS took place in January 2006 at Arab Health in Dubai were the first scientific meeting was organised with the participation of international faculty from Europe and North America. The first AGM was also attended by nearly 75 interventionalists mainly from the Middle East with some representation from the North African Arabic countries. A proposed bylaw was presented and adopted and the first governing board composed of a president, a vice president, a secretary, a treasurer and five members was elected.

The future direction of the society was discussed and preliminary plans for the following years were developed by the Executive Committee. It was decided that one of the most pressing issues was linking with the major sister societies to benefit from their experience and expertise. At CIRSE 2006 in Rome I had the chance to meet with then CIRSE President Prof. Johannes Lammer to discuss how the successful collaborative initiative model that CIRSE had started with other international societies could be an appropriate platform for future links between PAIRS and CIRSE. PAIRS extended an invitation to Prof. Lammer and the officers of CIRSE to attend its second scientific meeting in Jordan. In the spirit of continuing and strengthening the collaboration between the two societies, members of PAIRS were offered the opportunity to benefit from group membership of CIRSE. This is testimony to the forward thinking of the leadership of CIRSE in their efforts to encourage international collaboration in the field of IR. Furthermore PAIRS was subsequently invited by current CIRSE President Prof. Jim Reekers to take part in CIRSE 2008 under the successful format of the "CIRSE meets…" sessions.

PAIRS' third scientific meeting took place in Cairo in February 2008 maintaining the high caliber of contributions from the invited faculty. The presentations by members of PAIRS also reflected their increasing experience. Discussions had already started with SIR to build a collaborative initiative particularly in regulatory & training issues. We hope that this collaboration will also help to enhance the work of our society. Initiatives to expand the membership of PAIRS across the Arab World are being formulated and put into effect under the guidance of the new Board and current PAIRS President Dr. Hazem Habboub.

At "CIRSE meets PAIRS" in Copenhagen three members of our society will present topics that were chosen to reflect the different aspects of IR practice in the Arab World; treatment of diseases that are common in the region, novel methods of treatment for universal conditions and regulatory issues facing the practice of IR.

Hydatid disease is endemic in large parts of the Middle East as well as parts of Eastern Europe. Percutaneous treatment represents one of the most efficient methods of dealing with this menacing condition. Dr. Maurice Haddad who has published extensively on the subject will present his experience.

Male impotence secondary to venous incompetence is probably largely under-diagnosed and presents a challenge in management. Dr. Hazem Habboub will present his experience in treating this condition using the new embolic material Onyx.

Regulatory issues relating to the practice of IR may be approached in different ways depending on the legal framework of the respective country. Dr. Adel Ahmad will present the Kuwaiti model of introducing regulations to safeguard the specialty and ensure the highest standard of healthcare. These regulations may be applicable and adaptable to other countries.

The collaboration between our young society and CIRSE is of great importance for the development of IR across our region and will hopefully continue to grow. I think that through CIRSE Group Membership and the CIRSE meets PAIRS session we have made important steps in this direction.

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Torben V. Schroeder
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Rigshospitalet, Copenhagen, Denmark

Vascular Surgery and Interventional Radiology - Time for integrated fellowships and eventually a merger

Don't miss it !
Management of peripheral vascular disease I
Foundation Course
Sunday, 10:00-11:00, Room A

Vascular Surgery has changed markedly over the last decade for a number of reasons, most importantly the developments in endovascular techniques. Physicians and patients want the best results using the most recent technology. Patients are particularly attracted to the least invasive methods. Although the long-term durability of many of these minimally invasive procedures seems somewhat inferior to that of open surgery, the attraction lies in the lower perioperative morbidity and mortality (1). Moreover, recurrences may still be handled with endovascular techniques. The lower M&M has enabled management of patients otherwise considered unfit for surgery, though in direct comparison the benefit of endovascular repair may in fact be more convincing in the fittest patients (1). Today at least a third of vascular surgical patients are primarily managed endovascularly after clinical assessment including non-invasive imaging. In single centres the number is even higher - and the proportion is still increasing.

The endovascular evolution
Although many vascular surgeons have been personally involved in the endovascular revolution, most have been spectators, referring their patients to catheter skilled radiologists. The vascular surgeon has the patients, while the interventional radiologist masters a technique, which under certain circumstances is the preference of the patient and the attending physician. These patients will undergo minimally invasive procedures in most instances outside of the department of Vascular Surgery, i.e. in the department of radiology, and under the responsibility of the interventional radiologist. These two, the interventional radiologist and the vascular surgeon, have planned the endovascular treatment together, but except for the endovascular handling itself patients remain under Vascular Surgery service and are not seen by interventional radiologists, neither before nor after the treatment. This organisation seems prevalent in most Scandinavian and many European countries with Vascular Surgery and Interventional Radiology collaborating closely and being complementary.

Interventional Radiology has also undergone substantial changes since initially being a vascular subspecialty. Today Interventional Radiology has the application for the diagnosis and treatment of multiple pathologies of many other organs than the vessels and interacts with many specialties. Based on a national survey in Denmark covering all interventional radiological activity in 2007 performed by the Danish Society for Interventional Radiology (DFIR) (Courtesy of Marc Hansen and John Grønvall), a total of 5,300 procedures were performed (close to 1,000 per 1 Mio. inhabitants). Of these, 60% were "classical" vascular, i.e. arterial PTA, EVAR, venous procedures, including dialysis fistula interventions. Another 20% were "the classical non-vascular interventional radiological" procedures, such as embolisations (tumour, uterus, GI-bleeding, etc.) and managing liver diseases with percutaneous transhepatic choleangiography (PTC) or transjugular intrahepatic portosystemic shunt (TIPS). The remaining 20% were nephro- or urererostomias or suprapubic bladder catherisations. These urologic procedures were unevenly distributed throughout the country, as most were performed by the urologists themselves or by radiologists under ultrasound guidance. Thus, leaving out the urological procedures, the distribution was close to 75% vascular and 25% non-vascular.

The peace is threatened
However, as volume - relative as well as absolute - of endovascular practice has increased over the years, this peaceful scenario of two specialties being complementary is threatened.

- Firstly, vascular surgeons find it increasingly problematic that other skilled craftsmen treat 30-50% of their patients, just because the vascular surgeon has not mastered that technique. Had it been a new open surgical technique, the surgeons would have attended meetings and visited skilled colleagues to learn the technique and would then have added it to their existing surgical practice (2). However, endovascular skills are not that easily acquired. Moreover, did it only concern 5-10% of patients - which was the case 10 years ago - it would seem reasonable, but today the number is much higher with figures still increasing while the number of patients treated with open surgery is declining. This situation may be tolerated by the elderly generation of vascular surgeons, but not by the next generation. Recently UK surveys have clearly identified a wish among vascular trainees to make endovascular training mandatory (3). Moreover it seems that most interventional radiologist would not mind training vascular surgical trainees. In the UK a joint training pathway in Vascular Surgery and Interventional Radiology has been proposed and a curriculum developed aiming at creating vascular specialists trained to provide vascular service utilising open as well as endovascular techniques (4). In the United States they have been implemented in a number of centres (5,6)

- Secondly, a number of papers have addressed the fact that interventional radiologists have limited clinical responsibilities and that this should be changed (7-9). It has also been suggested that Interventional Radiology is suffering an image problem (7). A survey has shown patients' awareness of Interventional Radiology to be lower that that of virtually any other specialty in medicine. Furthermore it has been aired that there is an insufficient number of interventional radiologist to deliver treatment, particularly on an acute basis (4).

- Thirdly, the increasing number of patients needing endovascular procedures constitutes an economic incentive for other physicians who have catheter skills, for instance cardiologists or vascular surgeons, who no longer accept that Vascular Surgery and Interventional Radiology should continue to be complementary and instead do the endovascular procedures themselves. In some institutions there may even be confrontations between interventional radiologists, cardiologists and vascular surgeons over who should perform percutaneous non-cardiac peripheral vascular interventions.

Some vascular surgeons participated in the evolution of Interventional Radiology, others have taken up catheter-based procedures themselves. Cardiologists have also wanted to take part in the blooming catheter-based "peripheral arterial industry". This has led to several headings like "Who is trawling our waters", "Turf wars and silos" and "The battle for peripheral interventions" (11,12).
Between 1997 and 2002, procedure volume in percutaneous peripheral arterial interventions grew at faster rates among cardiologists, vascular surgeons and other physicians than it did among radiologists. As a result, the radiologists' share of this market declined during the interval, although the absolute numbers increased. The vascular surgeons' relative share increased the most, but in 2002 still only by 10%. Cardiologists were responsible for more that one third of the procedures (11).

- Finally, with the increasing numbers the traditional separation of vascular surgeon and interventional radiologist may be criticised for inefficient patient care, management and training.

The future
You may well ask whether Interventional Radiology can survive and flourish as a technology-based nonclinical specialty (7,9). And similarly you may ask whether Vascular Surgery can continue in isolation without taking part in the minimally invasive surgical treatment of up to one half of their patients. Moreover, the above listed problems may seriously hamper the recruitment of the next generation of vascular physicians.

From a vascular surgical perspective I see only one sensible solution for the future, which is an increasingly closer collaboration, eventually leading to a merger between the two specialties (12). The first step is an integrated fellowships - vascular surgeons need to develop proficiencies in endovascular techniques and interventional radiologist need to develop full responsibility for the longitudinal care of the patients they treat (6). The current organisation will not survive.

In the future the majority of vascular specialists should be able to perform basic operations, as well as endovascular procedures, whereas only a more limited number of vascular specialist will be responsible for the complicated open and the advanced endovascular procedures, respectively. The less attractive alternative is that vascular surgeons somehow achieve the necessary technical skills and do the procedures themselves - like the cardiologists did years ago.

An argument from interventional radiologists against merging with Vascular Surgery is that this would make interventional radiologist move away from their mother specialty radiology. However this has already happened in many countries for Vascular Surgery which has moved away from surgery. And in many of the countries where it has not happened, the vascular surgeons are fighting for individuality.

Another argument against a merger is related to the substantial technological development. This has broadened Interventional Radiology from merely being a vascular subspecialty to treating multiple pathologies of many other organ systems. Again, in comparison Vascular Surgery involves a number of patients not considered suitable for endovascular management or who need no intervention at all.

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12. Green RM, Waldmann D for the center for vascular disease. Five-years results of a merger between vascular surgeons and interventional radiologists in a university medical center. JVS 2003;38:213-9

Advertorial

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With an international faculty of over 70 expert physicians, the Crossroads Institute provides training on the latest developments in cardiovascular care in cooperation with major societies such as CIRSE / ESIR (Cardiovascular Interventional Radiology Society of Europe - European School of Interventional Radiology), EBAC (European Board for Accreditation in Cardiology) and ESVS (European Society for Vascular Surgeons).

Training programs cover various therapies such as carotid stenting and treatment of diabetic patients with CLI. Hands-on courses include working on close-to-reality flow models in an operational cath lab as well as VR simulation training. Discussion Forums for experienced physicians are provided on a regular basis.

Product Portfolio

Abbott Vascular offers a comprehensive range of vascular solutions with an advanced portfolio of carotid, peripheral and vessel closure products to assist physicians in a broad range of interventional procedures.

Peripheral Intervention Products

Abbott offers broad lines of self-expanding and balloon-expandable stents for treating peripheral arteries in iliac, SFA and infrapopliteal occlusive disease.

- The Absolute Self-Expanding Stent System for SFA has clinically proven superiority over the use of PTA alone [N Engl J Med 2006; 354:1879-88]. The established durability of the stent implant shall be leveraged in designing the SFA DES stent in future. Our new generation of Absolute Pro Self - Expanding Stent System enables physicians to treat even more challenging cases. The innovative delivery system improves the push and the trackability.
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- The Xpert stent system has been specifically designed for small vessels. This self-expanding stent system is available in diameters from 3mm to 8mm, with excellent clinically-proven one-year results in limb salvage with CLI patients

Carotid Stents and Embolic Protection Devices

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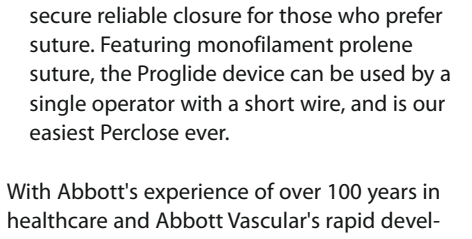
- The RX ACCUNET Embolic Protection System is used by hundreds of physicians worldwide and features a dual strut filter basket and two different recovery catheter choices with a fixed wire design.
- The Xact Rapid Exchange Carotid Stent System offers accurate sizing, minimal foreshortening, high scaffolding, and high radial force at the lesion.



- The Emboshield PRO Embolic Protection Device is one of the latest embolic protection systems, based on bare wire technology with a highly visible filter and catheter tip to allow accurate and easier handling, a short filter parking length, and a highly visible retrieval tip.

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A pioneer in closure technologies, Abbott Vascular offers products designed to facilitate secure closure of the vascular access site after coronary and peripheral catheterisations. Clinicians use these products to help patients ambulate safely and improve patient comfort.

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With Abbott's experience of over 100 years in healthcare and Abbott Vascular's rapid development of new medical devices, Abbott is well-positioned to bring the interventional community innovative next-generation products and programs that will lead to better patient outcomes. Abbott Vascular's product offering covers carotid, peripheral and vessel closure devices, as well as a range of products for the treatment of coronary artery disease such as drug-eluting coronary stents, bare metal coronary stents, guide wires and catheters.

Information contained herein is for outside the U.S. and Japan only.
Please check the regulatory status and availability of the products mentioned in area where CE marking is not the regulation in force.
Additional information on Abbott Vascular, its products, clinical trials and news is available on the company's website www.abbottvascular.com

Can experience really make a difference to outcome for carotid artery stenting (CAS)?

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Education is when you read the fine print.
Experience is what you get if you don't.
Pete Seeger

The results of the EVA3S trial were disappointing for many who have independently reviewed outcomes for CAS and felt that they were (and are) not nearly as bleak as they were within this trial (1). As if then almost to add insult to injury, it became clear that the authors of the paper, published in the New England Journal of Medicine, considered that the experience of the interventionist (whatever their background) did not influence the outcome for patients in the CAS limb of the trial.

For those who are unfamiliar with this trial, 527 patients were randomised to either surgery or CAS for symptomatic carotid stenosis (>60% by NASCET criteria). The recruiting centres were a mixture of both academic and non-academic centres totalling 20 and 10 respectively. No difference in outcome was seen in centres that enrolled <21, 21-40 or >40 patients. When comparing the enrolling physician's experience, no statistical difference was seen between those with 'experience' of >50 procedures, those with less than 50 procedures experience, and those still being proctored after training (major adverse event - MAE rates 12.2%, 11.0% and 7.1% respectively).

This would appear to be counterintuitive and a cynic would argue that it is the first ever demonstration of a reverse learning curve. Of course the trial was never powered to come to a statistically meaningful conclusion with respect to "learning curve" and there is a not insubstantial risk of a Type II error on the grounds of relatively small numbers. In reality, 85% of those performing CAS within EVA3S had performed less than 50 procedures in total (2) and many operators would consider that this represents intervention on the steep part of the learning curve for CAS (3,4).

With regards the relationship between throughput and outcome (and by logical extension, experience and outcome) for carotid endarterectomy (CEA), level-I and supporting evidence from Europe and the United States indicates a linear relationship (5, 6). The relationship between throughput and outcome for carotid stenting is less clear. However, as a highly technically complex procedure, it is likely that such a relationship exists. It certainly does in many other procedures. Exploring the relationship between experience and outcome or volume and outcome for CAS is a complicated matter. The technique has evolved rapidly since its inception in the mid nineties; notable developments include dedicated carotid stents, fine guidewire and rapid exchange technology, low profile systems and cerebral protection devices. These technical refinements have occurred on a background of increasing practical and evidential experience. It is therefore difficult to extract the influence of technical advance from the influence of individual experience on outcome.

Furthermore, although there are superficially many sources of data (and hundreds of thousands of carotid stents performed around the world) much of the available data are opaque to public scrutiny. Redundant publication (duplicate data/updated reports from the same operators), self audit, voluntary data submission (to registries) etc. all serve to diminish data quality. The best available data comes from randomised trials (comparing CAS with CEA, not experienced versus inexperienced operators), case series, registries and post marketing surveillance studies. All have certain explicit limitations.

Randomised trials tend to have polar opposite attitudes to the experience of the operators performing CAS. For example, physicians performing CAS within CREST are carefully vetted. In order to receive credentialing just to recruit into the lead-in (non-randomised) phase, interventionists had to complete animal training, submit procedural and follow-up reports for peer review, attend a CAS operator's course and submit to a first-case observation by the device manufacturer's representatives. Following this, each interventionist was required to treat up to 20 lead-in patients using the only stent and protection device approved for use within the trial (Acculink and Accunet; Abbott Vascular, Santa Clara, CA), demonstrating excellent technique and results before receiving approval to enrol patients into the randomised phase. Before we accuse CREST of being overly proscriptive, it must be remembered that over 40% of surgeon applicants applying to join the ACAS trial were rejected on the grounds of insufficient experience or suboptimal results (7). The "yin" to CREST's "yang" must surely be EVA3S. The trial protocol stated that interventionists had to have performed 12 CAS or 35 supraaortic stents (5 of which had to be CAS). However, when the trial started to recruit (in the year 2000), there were only around 4 centres in France with CAS experience and because it therefore took a very long time to recruit, the rules may have relaxed. Certainly, the final paper states "centres fulfilling all requirements except those with regard to the interventional physician could join….stenting procedures had to be performed under supervision…). It appears that it was perfectly feasible for an interventionist to perform their first ever CAS procedure within this trial, with guidance from a proctor who had done as little as 5 CAS procedures. Furthermore, most interventionists would consider experience in supra-aortic stenting (utilising very different technologies and techniques from CAS) to be irrelevant when considering CAS expertise.

Unfortunately, neither the CREST or the EVA3S recruitment structure allows a realistic analysis of the experience-outcome relationship.

Regarding registries, data submission is on a voluntary basis and it is human nature not to proffer cases with bad outcomes. Furthermore, most registry data outcomes are self-audited, a notoriously unreliable activity. Post-marketing studies intend to demonstrate safety in a real-world setting and are becoming common as a "Condition of Approval" by bodies such as the FDA. However, most of these are formulated to evaluate particular stent/protection device combinations and participation in these studies is inevitably influenced by industry keen to show the products in a good light. Undoubtedly, experienced interventionists would be preferentially invited to participate.

Perhaps the most effective way of scrutinising the relationship between experience and outcome is to evaluate outcomes in single centres over time, after technical advances have been made and to cross-reference this against year on year outcome data where possible from independent multicenter CAS registries (for example the Wholey registry).

Our group recently performed a systematic review, evaluating 773 papers on carotid stenting by using the primary search terms "carotid artery", "stent" or "angioplasty", in conjunction with the terms "volume", "outcome", "learning curve", "experience" and "randomised controlled trial". Twenty had data on >100 patients suitable for the analysis of experience and outcome. Where duplicate publications or data sets comprised updates from ongoing series, the latest publication was utilised. For the purposes of this article we will focus on six sizeable series and four independent registries.

The six independent case series include Boltuch et al (2005) (8), superseding Ahmadi et al (2001) (9), Lin et al (December 2005) (10), replacing Lin et al (June 2005), McKevitt et al (2004) (11), Roubin et al (2001) (12), Verzini et al (2006) (4) and Setacci et al (2007) (13). There were improved results with time in 5 of 6 series, with the differences reaching statistical significance in 4. Three of these papers aimed specifically to evaluate the learning curve.

Ahmadi et al (2001) (9) (eventually superseded by Boltuch et al 2005), evaluated three hundred and twenty CAS procedures as four groups of eighty cases (although this predated technological advances in CAS such as rapid exchange systems and protection devices). There was a significant reduction in the frequency of neurological complications after the initial 80 interventions (p = 0.03), but technical success was not appreciably improved with increasing experience thereafter. It was concluded that a relatively large number of interventions (i.e. 80) should be performed to overcome the negative effects of the initial learning phase. This paper showed temporal improvement in outcomes even when protection devices were not employed at any time-point.

Lin et al presented their results in two hundred consecutive protected CAS procedures in 182 patients in 2005. The results were analysed in four sequential groups of 50 procedures. The 30-day stroke and death rate was 8% in the first cohort, 2% in the second and zero in cohorts 3 and 4. This paper would suggest a learning curve of 50 procedures with continued improvement despite the use of protection devices from the start of data collection (10).

Verzini et al evaluated 627 CAS procedures performed with cerebral protection and dedicated carotid stents between 2001 and 2006 (4). When comparing the results of the first 3 years (n=195 CAS procedures) with the second three years (n=432 CAS procedures) the 30-day major stroke and death rate decreased from 3.1% to 0.9% (P = .047), and the 30-day any stroke and death rate decreased from 8.2% to 2.7% (P = .005). The authors concluded that the results highlighted the importance "of an appropriate learning curve that involves a caseload larger than that generally accepted for credentialing".

The largest of the independent CAS registries is the 'Global Carotid Artery Stent Registry'. The first report from this registry was published in 2000 and demonstrated a non-significant reduction in stroke and death between 1997-1999 (14). This time period largely predated any important technical advances. Data on 12,392 cases from 53 centres were included in the 2003 update of this registry (15). The paper graphically demonstrated a steep learning curve for protected CAS. Stoke and death rates for centres that had performed 20-50 procedures were 4.04% compared with 1.56% for those that had performed over 500. It is difficult from these data to set a figure on case number required for competency (presumably somewhere between 50 and 500!)

The German Arbeitsgemeinschaft Leitende Kardiologische Krankenhausärzte (ALKK) included the results from 1,888 patients treated in 28 hospitals over nine years (16). Analysis of these data confirmed a progressive reduction in stroke rates from 1996 to 2004 (6.3% to 1.9% respectively, p=0.02). Major confounding variables in this registry are the linear increase in the use of cerebral protection devices from 1996-2004 and the proportional increase in asymptomatic patients treated.

The Pro-CAS registry, another sizeable German registry, reported the combined rate of permanent neurological deficit and death in three cohorts; 735 patients treated before technical advances in October 2000, 923 patients undergoing unprotected CAS (after technical advances) between October 2000 and 2003 and 1609 concurrent patients undergoing protected CAS between October 2000 and 2003 (17). The respective event rates were 4.6%, 2.2% and 2.1%. Whilst some of the improvement in outcomes between the pre-2000 and post-2000 cohorts may be ascribed to certain technological advances, (such dedicated carotid stents - (11), it is difficult to escape the conclusion that the experience of those centres submitting data to this registry had an important influence on outcome, particularly as the adoption of protection devices post-2000 did not appear to lead to a significant improvement in results.

Of the series and registries, there were four in the pre 2000-2001 time frame (9,16,18,19) and four in the post 2000-2001 time-frame (3, 13, 13, 16) with year-on-year outcome data. There were at least trends to improved results with time (some were statistically significant) in both time periods. The available data support the perception that results for CAS have improved with time. It also demonstrates that results can vary widely between centres and studies. The influence of advances in technology on the overall reduction of the adverse event rate is difficult to extract from the influence of individual experience. Perhaps the most convincing data come from centres with "stable" i.e. non-evolving CAS technique. The consistent improvements in results even following the introduction of cerebral protection devices would support the contention that operator experience is a critical element in improved results.

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VR-HWS 5: Virtual Reality – carotids
Hands-on Workshop
Monday, 16:00-18:00, Simulator Gallery
Carotid artery stenting (CAS)
Special Session
Wednesday, 8:30-9:30, Room B

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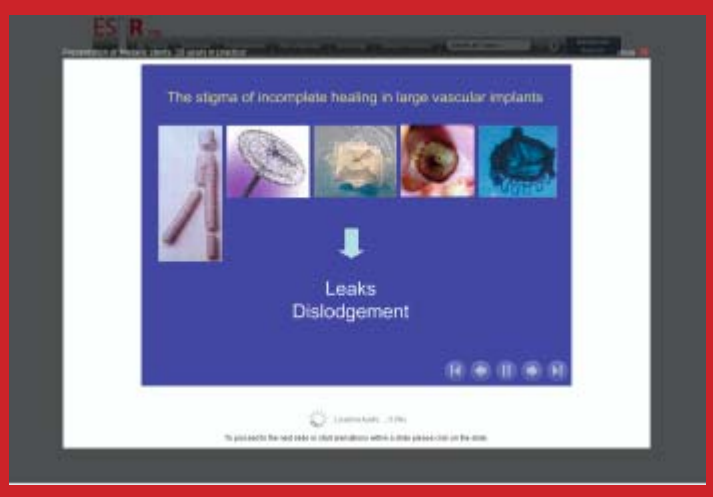

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Johannes Lammer
CIRSE Foundation Chairman

The CIRSE Foundation - A Catalyst for Education

After my two year term as society president ended in 2007, I took on the great responsibility of leading the CIRSE Foundation in the next two years. I am honoured to be given this great opportunity to support the development of Interventional Radiology in Europe through the CIRSE Foundation's many activities.

While the society supports interventional radiologists in issues concerning their daily practice, the CIRSE Foundation must be a catalyst for education, making sure that Interventional Radiology continues to be carried out by innovative and well trained physicians, as it has in the past. To achieve this purpose and with the support of our industry partners we base our activities on the following four pillars:

- Education grants: Every year the CIRSE Foundation awards € 100,000 in grants to young interventionists who wish to learn new procedures in other hospitals. Thanks to this programme numerous physicians have been able to widen the range of their skills and disseminate new procedures in their hospitals.
  The European School of Interventional Radiology (ESIR) is the educational arm of the Foundation, providing onsite education on a wide range of procedures at low cost. The two day courses include lectures of European experts as well as case discussions in small groups. In 2008 we have increased the number of courses to 13. They will take place in various European countries and include vascular and non-vascular topics as well as "hands-on" courses in the learning centers of Abbott (Diegem) and Cordis (Hamburg). Up to now 470 physicians have taken the opportunity to attend the ESIR courses. In this context I would like to thank the local course organisers and the lecturers for their work and enthusiasm.
- Topic-related Special Focus Conferences every spring will support our main CIRSE meeting in September. All of those who are unable to come to the CIRSE Annual Meeting or who want to get in-depth education on special topics will have the opportunity to update their knowledge during these meetings. After an excellent kick-off with the first European Conference on Interventional Oncology and the first European Conference on Embolotherapy ET ECIO 2008 attended by 1,200 delegates the Foundation will organise an educational meeting every spring. In this context I would like to thank Tony Nicholson and Riccardo Lencioni for their superb organisational work. In April 2009 the CIRSE Foundation will organise a GEST Europe meeting together with the GEST founders. A second ECIO will be organized by the CIRSE Foundation in early 2010.
- In addition to low the cost courses of the ESIR and the educational spring meetings mentioned above, the CIRSE Foundation offers interventional radiologists online education accessible through a new dedicated website. www.esir.org is a fantastic new tool comprising all material from recent CIRSE congresses and EPOS presentations.

As you can see the Foundation has been very active and the possibilities for additional activities are practically endless. I invite all of you to take advantage of the Foundation's many educational services and look forward to seeing you at one of our meetings.

The Structure of the CIRSE Foundation

The CIRSE Foundation is a non-profit organisation based in Switzerland. It is governed by the Board of Trustees which is the ultimate authority of the Foundation and is in charge of its overall governance and subordinated agencies.

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ESIR

The European School of Interventional Radiology keeps expanding

After its introduction in 2006 with the first two courses on vascular interventions, further ESIR courses were introduced in 2007 covering more treatment methods in host cities all over Europe. Topics included radiofrequency tumour ablation, non-vascular upper GI interventions and basic as well as advanced vascular interventions. The response to the ESIR programme has been overwhelming; young interventionists from the individual host countries are keen to learn about interventional procedures and even colleagues from as far as Japan have joined the courses.

In 2008 there have been 5 ESIR courses and 8 more will be held until the end of the year including 4 Institute Courses held at the Cordis Cardiac & Vascular Institute (CCVI) in Hamburg (DE) and at the Crossroads Institute in Diegem (BE). Due to the great success of the 2007 RFA course in French language, another RFA course was held in French in 2008. Additionally one course on Embolization Therapy will be held in Spanish in Valencia, Spain.
The ESIR course programme 2008 is kindly supported by educational grants from Cook, Cordis, Abbott, Boston, Celon, CeloNova, ev3 and St. Jude Medical.

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* Schillinger M et al. NEJM 2006; 354:18
** Comparison to Absolute Peripheral Self-Expanding Stent System - Source: Tests performed by and data on file at Abbott Vascular

Abbott Vascular

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Sunday, 16:15-17:45, Room Closure Devices



Lars Lönn (1) *Max Berry (2)* *Patrik Hidefjall (3)*

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Expanding roles for simulation technology

Today clinical practice does not offer the same opportunities as it used to for beginners to start training endovascular procedures through traditional angiography, as non-invasive modalities such as CT, MR and duplex ultrasound are increasingly used before a decision is made to treat a patient. Alternatives such as animal labs provide the opportunity to operate on a living creature, but form other obstacles. Notwithstanding the ethical issues, animal anatomies vary significantly from the human model, medication metabolism and reactions are drastically different and the costs of such experience can be prohibitive. These circumstances challenge a facility's ability to train even the most basic endovascular skills in a controlled environment.

A foreseeable increase in the incidence of peripheral vascular disease and thus minimal endovascular procedures translates into an increased need to train the next generation of interventionalists. Endovascular simulator training of basic skills answers this training need and offers the ability to provide an introduction to endovascular procedures, including demonstration of the selection and the subsequent manipulation of different devices in a correct sequence order for a specific procedure.

As simulators offer several patient cases, trainees learn how different device shapes and sizes work within various anatomies. These exercises help to reduce the manipulation of equipment required to selectively engage specific vasculature. Awareness and understanding of which C-arm projection angles will work best for certain anatomic regions and lesions is another skill learned via working on the simulator. A key benefit to the fluoroscopy functionality of a simulator is that the learner experiences no exposure to radiation. Simulation therefore equates to the safest "practice" field available for the operator and the patient.

With current advances in simulator development there will be simulators that offer objective feedback in the form of an evaluation report afterwards as well as the immediate response in case a mistake is made by the trainee. In this event there will be a tactile response to the operator which will be accompanied by the appropriate hemodynamic responses to mimic a realistic scenario. This type of interaction makes simulators more realistic for a wide range of users from the novice to the expert.

Simulation allows an experienced practitioner to train how to avoid and, if necessary, how to manage a complication during a procedure. The associated training would more fully prepare the trainee for the rare occasions that do occur in clinical practice after all. Simulators can ensure that a variety of complications have been presented and a minimum threshold of competency met, regardless of the experience level of the learner.

In order to readily translate technological progress in simulator design into a situation where simulators are widely adopted and accepted for their contribution to clinical practice, there is a need for the professional community to do evaluation studies that validate the functionality and metrics used in the simulators. This is a challenging task, as simulators constitute a moving target. However, without validation of simulator behaviour and metrics simulators may not attain their full potential. With validated data a much improved acceptance of simulators for other purposes such as regular quality assurance, assessment and training of experienced clinical staff can be expected. Important issues may be to train optimal imaging projections, to minimise radiation exposure and to train minimal use of contrast media.

Validated simulators may be used both in initial certification of medical specialists and in regular testing for physicians to maintain their credentials. Also the medical device industry may have to prove to regulatory authorities that their medical doctor customers have been correctly trained to ensure a safe and efficacious deployment of their clinical devices in a simulated clinical setting.

Today simulators have become widely accepted by medical educators and simulator centres have been established at many teaching hospitals. However, it is generally agreed that even once simulator centres are established the services they provide are often underutilised in the existing medical curricula and hospital-internal quality assurance routines.

It should be recognised that Simulation Centre Training capabilities have demonstrated a cost effectiveness of the teaching methods employed. These methods and results have yielded patient safety benefits as well as a safe work environment for those who have the opportunity to experience and learn from the available technologies and expertise. Maybe regulations similar to the aviation simulation model are needed in the health care sector in order to reap the full benefits that simulation has to offer. The use of simulators in certification and credentialing is proposed to enhance patient safety by ensuring that medical professionals have been properly trained and tested.

In conclusion the incorporation of virtual reality simulation in training is already here, despite lack of proven efficacy in randomised double-blind studies. In the future the adoption of this training might well be patient driven rather than doctor driven. A structured training program, i.e. curriculum, must be developed in order to merge cognitive and clinical skills with pure technical knowledge.

In cooperation with the SIR, the CIRSE Simulator Task Force led by Dr. Derek Gould from Liverpool has been doing continuous work in this field. Other important research groups include Professor Anthony Gallagher's, as well as Professors Nick Cheshire's from the Imperial College in London (the EVEREST team). A few Education and Simulation Centres also exist within Scandinavia: Oslo, Norway, Stockholm and Lund, Sweden. In Denmark, the respective centre is located in Copenhagen; the Centre of Clinical Education in Copenhagen led by Professor Charlotte Ringstedt.

Patrik Hidefjall is a Mentice Employee. Lars Lönn is a paid consultant for Mentice.

Photo Exhibition + Contest

In our many years in radiology we have had the chance to attend numerous congresses, getting to know colleagues from around the world. In these encounters we have noticed that many of us share a hobby: photography. To us this shows that some people were simply born to be imagers.

To share this passion with all our colleagues, CIRSE has organised the first CIRSE Photo Exhibition featuring photographs created by its members and congress delegates. The exhibition is located vis-à-vis the Abbott Lounge at the main auditorium foyer and can be visited throughout the congress. To vote for your favourite picture, please use the computer next to the exhibition. The winner will be announced at the Foundation Party.

We hope that you will enjoy this interesting new feature of the congress an look forward to the Photo Exhibition and Contest becoming a regular feature of the CIRSE meeting !

Jim Reekers
James Spies

Don't forget !

Don't forget to cast your vote for the best CIRSE 2008 Photo Exhibition picture vis-à-vis the Abbott Lounge next to the main auditorium entrance.

Holland by Jim Reekers

A sunny danish coast by Frank Meijer

[not titled] by Iftikahr Ahmad

[not titled] by Levent Oguzkurt

Cappadocia at dawn by Peter Nye

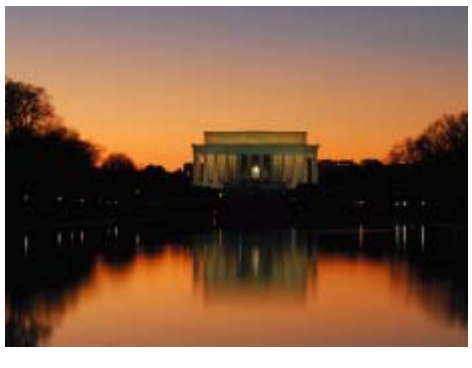
Chimney rock in Cappadocia, Turkey, by Erol Akgül

Sami by Linda Scott

Freefall on the hill by Josh Burrill

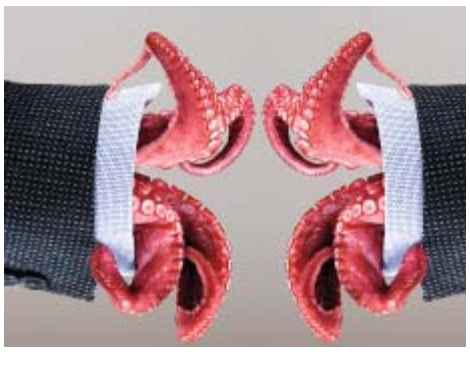
GEST 2007 by Petr Duras

La vie en rose by Rick Shoenfeld



The Lincoln Memorial at sunset by James Spies

Long Lake at the south coast of the Black Sea by Kairgeldy Aikimbaev



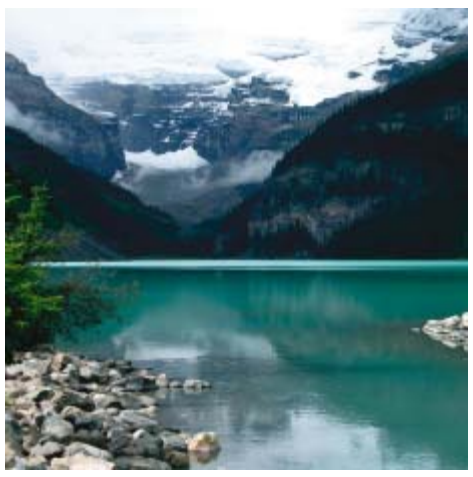
Vascular Surgery by Wojciech Cwikiel

Red sea fan at Balicasag by Pierre Thoorens

Silverton Mountain, Colorado by Dennis Griffin

The outsider by Andrew Jones

The holy Tibetian Mountains by Winnie Chan



Lake Louise, Alberta, Canada by Kirsteen Burton

Myself entering the water by Milan Totev

Sunrise at the Floe Lake, Rockwall, Kottenay National Park, BC, Canada by Jan Namyslowsky

Cow with a view by David M. Kasper

Deep vein thrombosis and pulmonary embolism: diagnostic and therapeutic pathways

Patrick Haage
Professor and Chairman, Department of Diagnostic and Interventional Radiology Region West, HELIOS University Hospital, Wuppertal, Germany

Don't miss it !
IVC filters
Special Session
Sunday, 10:00-11:00, Room B

Various strategies in the diagnostic process for suspected deep vein thrombosis (DVT) and pulmonary embolism (PE) have been developed and introduced, including clinical pre-test probability assessment, D-Dimer testing, ultrasound imaging and CT and MR pulmonary angiography (CTA, MRA). PE should be assumed in every patient with inexplicable dyspnea, tachypnea or acute chest pain; its adequate diagnosis often relies on imaging techniques.

DVT itself is a potentially life threatening disorder particularly due to the associated risks of pulmonary embolism, renal failure and phlegmasia cerulea dolens. Chronic venous hypertension resulting in the "postphlebitic syndrome" as a consequence of DVT has been estimated to affect 500,000 individuals in the United States alone. Thus, timely diagnosis and treatment are essential measures to provide adequate care for the patient. This postulation is substantiated by the fact that the organization of a venous thrombus proceeds much faster than that of an arterial thrombus, thereby aggravating successful treatment strategies. Subsequent pulmonary embolism is a frequently observed cause of patient morbidity and mortality. Particularly patients with iliac and inferior caval vein thrombosis are at serious risk for pulmonary embolism and long-term clinical consequences of post-thrombotic syndrome.

Approximately 50% of patients with central deep vein thrombosis have pulmonary perfusion defects characteristic of pulmonary embolism. Thus patients with symptoms consistent with DVT should in the beginning receive a determination of pre-test probability using an established prediction model (Table 1). After determination of the clinical pre-test probability, a D-Dimer test should be performed if the pre-test score is >1 (Figure 1). A positive D-Dimer test entails an ultrasound examination followed by treatment in case of thrombosis.

Appropriate anticoagulation therapy is considered the standard DVT treatment. Interventions like thrombolysis and IVC filter placement are reserved for few individual indications, especially since there are no randomised data confirming the benefit of invasive procedures. The application of low-molecular-weight heparin as treatment of choice nowadays permits outpatient managing of most DVT patients. The duration of anticoagulation therapy depends on whether the primary episode was idiopathic or secondary to a temporary risk factor (e.g. surgery, trauma, malignancy). An international normalised ratio (INR) of 2 to 3 should be the target.

Clinically, requirements of an acceptable PE assessment are that it is feasible in most patients and leads to the proper diagnosis and consecutively the appropriate therapy. To this regard, evidence just as in DVT supports the use of a clinical prediction rule for establishing pre-test probability of PE (Table 2). Combining a D-Dimer assay with a clinical prediction rule cuts down the need for further imaging studies in appropriately selected patients, i.e. patients with low pre-test probability of disease. In "PE likely"cases an imaging study should follow. Angiography has long been recognised to be the most exact modality with a sensitivity and specificity of 95% and 100%, respectively. Thus it is deemed to be the reference standard that all other techniques have to be measured against.

Advantages include the option of inducing a local fibrinolysis-therapy via the angiographic catheter already in place. However, angiography is not possible in up to 20% of patients and due to its associated invasiveness, morbidity and sporadic mortality it is nowadays being employed less frequently and replaced by multi-detector CT and recently MRA, both of which are faster, less invasive, less operator-dependent and are associated with a smaller number of complications. Besides, the experience in properly executing, evaluating and interpreting a pulmonary angiogram is gradually decreasing in the younger generation of radiologists.

Looking at CT, another advantage is its widespread availability. However, adequate visualization of the pulmonary vascular tree cannot be achieved with a standard CT scan of the thorax; it requires dedicated imaging procedures and protocols which may be combined with a CT phlebography of the IVC, iliac veins and the lower extremity to depict potential peripheral thrombi (Fig.2,3). Using CTA as the initial imaging modality has proven to be cost effective. Also, CTA can disclose alternative or additional diagnoses. A patient suspected of having PE may happen to have pneumonia, a pneumothorax, an aortic dissection or a tumour, which can be diagnosed by CTA. MRA does offer advantages over spiral CT, because it does not involve ionizing radiation and makes use of smaller amounts of gadolinium chelates which have an even better safety profile than iodinated contrast agents.

Over the last few years many of the limitations of earlier MR techniques were dealt with. High signal-to-noise ratios and high contrast between flowing blood and pulmonary filling defects can now be depicted with the development of contrast-enhanced MRA in a single breath-hold, during "first-pass" imaging with Gadolinium-containing contrast media. The key aspects that restrict magnetic resonance angiography application are non-diagnostic quality of images and alterations that avert a patient from entering a magnetic field, which together are in the order of 15%. These difficulties are a weakness of MRA, particularly when compared with spiral CT.

Furthermore, the necessity to eliminate the need for breath-holding for the detection of pulmonary emboli in dyspneic patients is beyond question for any imaging modality. Improved gradient performance, ultrafast reconstruction capabilities and software tools for "on-the-fly" interactive MR scanning now offer the potential for real-time MR imaging with satisfactory contrast and spatial resolution for pulmonary MRA, which albeit will have to prove its ability to challenge the current examination of choice: multi-slice CT.

After confirmation of PE, heparin anticoagulation must be administered to patients. For patients requiring treatment beyond heparin anticoagulation due to massive PE causing circulatory collapse, systemic thrombolytic therapy is advisable if there are no absolute contraindications.

Unfortunately the rate of lysis-associated major haemorrhage and intra-cerebral haemorrhage is in the order of 20% and 3-5% of patients, respectively. Catheter-directed percutaneous therapy employing combinations of mechanical thrombus "rotating pigtail" fragmentation, aspiration and intra-thrombus lysis is a credible alternative. Advantages include fast hemodynamic shock relief, in part by offering the lytic drug a greater surface area for lysis after mechanical fragmentation.

In conclusion, any patient with clinically suspected PE must be risk stratified, in an ideal setting with a criteria-validated clinical decision pathway. Following the assessment of pre-test probability, D-Dimer assays quite reliably exclude PE in low risk groups. In 2008 CTA is the preferred initial imaging modality in the majority of cases.

Anticoagulation with low-molecular-weight heparin is considered the treatment of choice in DVT and stable PE patients. In unstable PE patients systemic thrombolysis and alternatively catheter directed thrombolysis, especially in case of contraindications to thrombolysis, can be advocated.

References:
1. Eggers H, Proksa R. Multiprocessor system for real-time convolution interpolation reconstruction. Proc Int Soc Magn Reson Med 1999;95
2. Garg K, Welsh CH, Feyerabend AJ, et al. Pulmonary embolism: diagnosis with spiral CT and ventilation-perfusion scanning: correlation with pulmonary angiographic results or clinical outcome. Radiology 1998; 208:201 - 208
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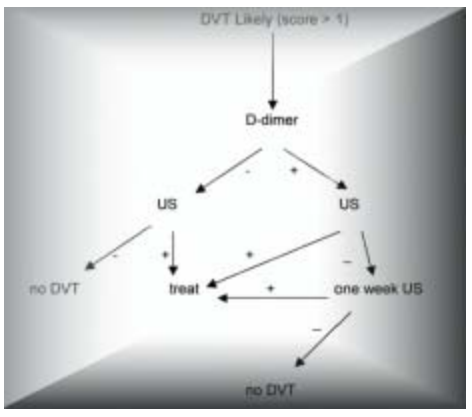

Fig.1: Diagnostic algorithm in case of "likely" DVT should include clinical probability, D-Dimer and ultrasound

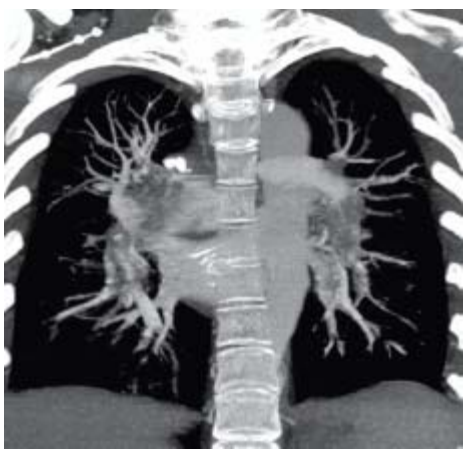

Fig.2: MIP-CT image accurately depicts multiple massive pulmonary emboli

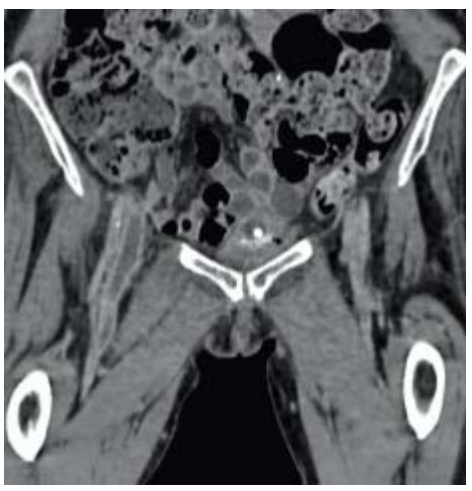

Fig.3: Corresponding CT phlebography in the same patient as Fig. 2 demonstrating a long segment right-sided femoral vein thrombus

Table 1: Clinical model for predicting pre-test probability of deep-vein thrombosis (DVT)

Clinical Feature	Score
Active cancer (treatment ongoing, administered within previous 6 mo or palliative)	1
Paralysis, paresis or recent plaster immobilization of the lower extremities	1
Recently bedridden > 3 d or major surgery within previous 12 wk requiring general or regional anaesthesia	1
Collateral superficial veins (nonvaricose)	1
Localized tenderness along the distribution of the deep venous system	1
Swelling of entire leg	1
Calf swelling > 3 cm larger than asymptomatic side(measured 10 cm below tibial tuberosity)	1
Pitting edema confined to the symptomatic leg	1
Previously documented DVT	1
Alternative diagnosis at least as likely as DVT	-2

A score of 2 or higher indicates that the probability of DVT is "likely". A score of less than 2 indicates that the probability is "unlikely."

Table 2: Clinical model for predicting pre-test probability of pulmonary embolism (PE)

Clinical Feature	Score
Previous pulmonary embolism or deep venous thrombosis	1.5
Heart rate >100 beats per minute	1.5
Recent surgery or immobilization	1.5
Clinical signs of deep venous thrombosis	3
Alternative diagnosis less likely than pulmonary embolism	3
Hemoptysis	1
Cancer	1

A score of >4 indicates that the probability of PE is "likely". A score of 4 and less indicates that the probability is "unlikely."

Don't miss it!
Interventional oncology in renal cancer
Special Session
Tuesday, 8:30-9:30, Room C

Interventional Oncology: Imaging is the key

David J. Breen
Clinical Director of Radiology
Southampton University Hospitals, UK

As radiologists, first and foremost, many of us know that imaging has become the de facto currency of modern medicine. Few patients, certainly from the surgical-interventional end of the spectrum, can be usefully discussed without concurrent review of their radiology. It is our ability to understand and manipulate this currency which places both diagnostic and interventional radiology at the centre of patient care. Nowhere is this more evident than in the arena of interventional oncology.

At the recent ECIO meeting in Florence, and in keeping with the tradition of interventional meetings, we heard about no end of new embolic agents and ablation devices. The underlying theme however was the role of imaging in a new era of non-extirpative treatments for cancer. As cancers get smaller at the time of reliable detection and characterisation, it becomes less necessary to invoke major resections - for example, the right hepatectomy for the solitary 2cm liver metastasis. In such circumstances outcomes from chemotherapy (and in particular newer biologic agents), embolization and ablation are jockeying for position against the morbidity of conventional resection. These interventions are however inherently non-extirpative, i.e. the treated cancer is not removed. Whilst the surgeon looks to the pathologist for the single negative resection margin, we must judge success against contrast-enhanced or increasingly functional imaging in all three dimensions. It is interesting to note that whilst resection margins are usually adequate in, say, hemihepatectomy, they are often less than adequate following metastatectomy. In other words the more tailored resection is a problem for all of us and particularly when absolute confirmation of complete ablation is sought.

With newer embolic agents we are all seeing dramatic areas of apparent devascularisation, in multifocal hepatocellular carcinoma for example, but what does it mean (Fig.1)? Similarly with ablation devices we must be able to convince both clinical colleagues and patients alike that the tumour has been effectively destroyed with adequate global margins (Fig.2a-c).

Therefore an ability to accurately confirm tumour eradication is essential to the practice of interventional oncology. Non-enhancement at post-procedural imaging is the current arbiter of treatment success, but can be limited by contrast, spatial and temporal resolution. Besides this in situ treatments invoke collateral changes, such as post-ablation marginal hyperaemia and subtended perfusional changes following embolization. Accurate post-procedural imaging will be essential to interventional oncology and was in fact the underlying theme of the recent ECIO meeting, linking both embolic and ablation approaches together. Whilst non-enhancement is useful, better characterisation following ablation or embolization awaits major developments in functional imaging where for example we know that FDG-avidity poorly, if at all, defines treatment success in areas such as hepatocellular and renal cancer and for the present spatial resolution remains limited.

5-year outcome data remains the gold standard for cancer therapies, but given the current rapid evolution of drugs and devices we must look to scrupulous intermediate term imaging to confirm the 'surgical' adequacy of many oncological interventions now being carried out. In reporting these critical imaging studies we must look to a common radiologic language which defines treatment outcomes. Various groups have sought to standardise the language used in reporting the post-procedural imaging resulting from these treatments (1,2). This will be an important step forward if those undertaking such procedures are to convince oncological and surgical colleagues that these interventions are anything other than tinkering with the overall tumour biology.

The unifying theme here is the critical interpretation of post-procedural imaging following in situ cancer therapies. Imaging - and its interpretation - is a critical component of 'Interventional Radiology' and remains one of our key skills, placing us at the centre of the discussion of clinical case management. In the rush to train more IRs there has, in recent years, been pressure to reduce the diagnostic component of the training schedule so as to allow more time for the development of technical skills. The understanding and ability to manipulate imaging - the currency of cancer interventions - has never been more important to the IR and we must not compromise on this aspect of our training or practice.

References:
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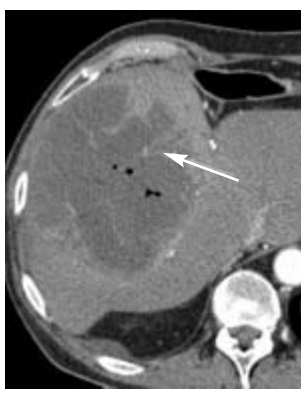


Fig.1: Late arterial phase CT of a large carcinoid tumour following 'Bead Block' embolization. Equivocal areas of enhancement noted deep within the embolized tumour (arrow). Whilst the effects are dramatic, a more clearly defined method of reporting treatment outcome will have to be sought.

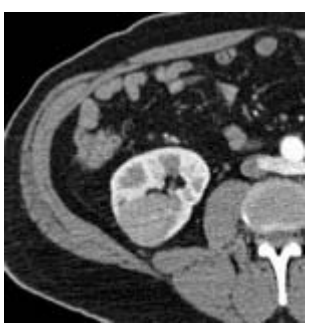


Fig.2a: A 42mm right renal tumour demonstrates brisk enhancement in the late arterial phase.

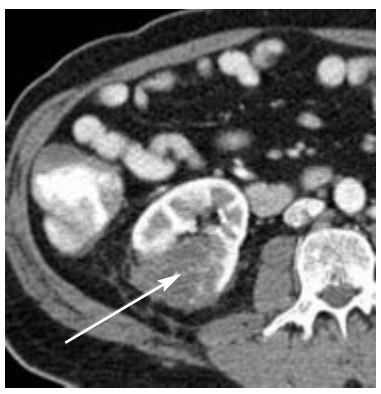


Fig.2b: Following RF ablation there are small linear areas of equivocal enhancement within the treated tumour mass (arrow). How should this be reported? Does this need re-treatment?

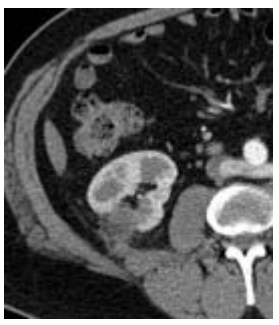


Fig.2c: A repeat cryoablation was performed. The tumour now shows clear progressive involution at 6 month follow-up.

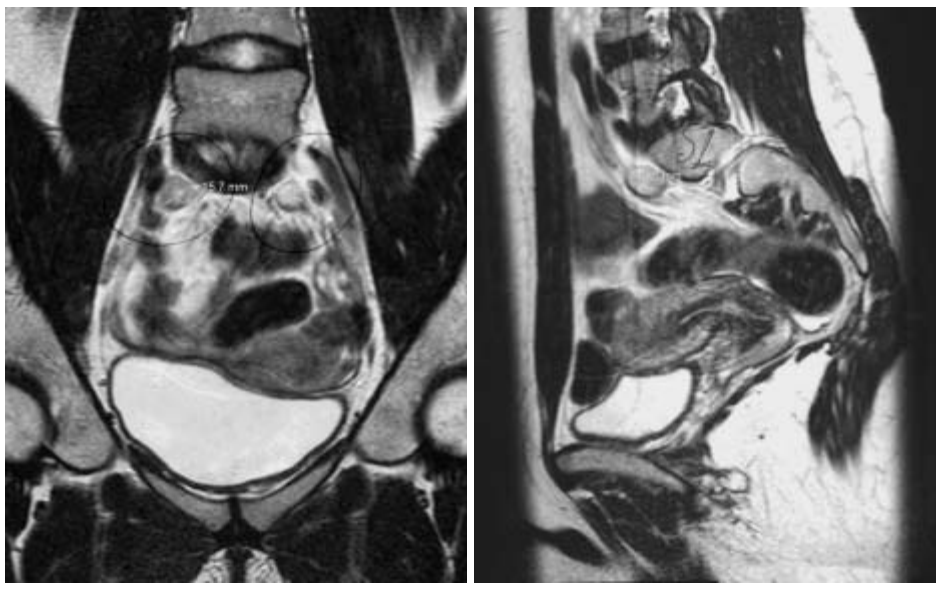
Film Interpretation Panel

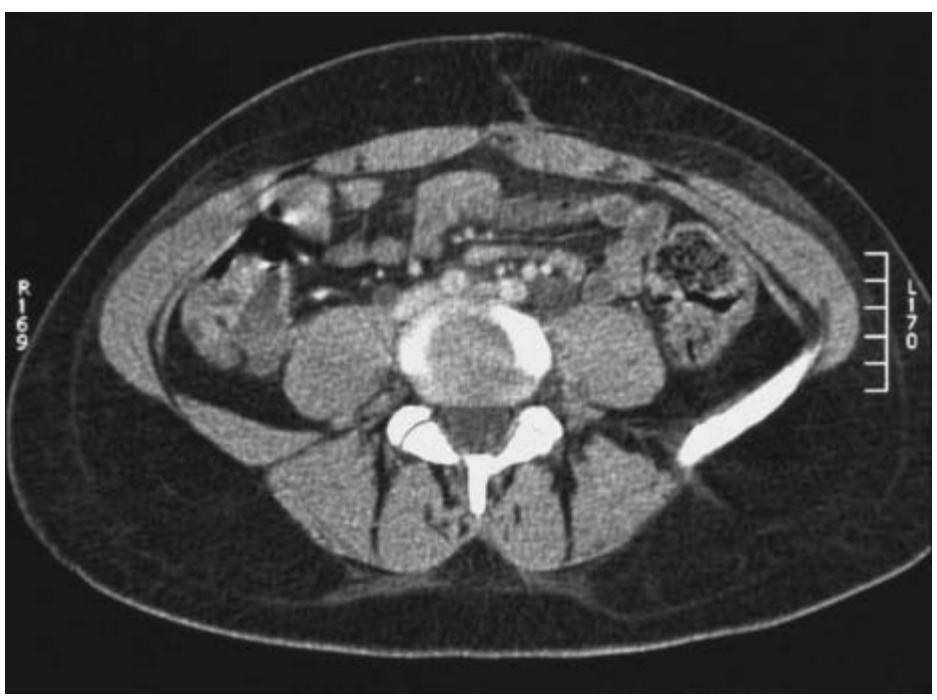
Join us to witness the fight of Team Odin versus Team Thor tomorrow at 3pm in Room A. For those of you who like to get a head start we have put together this year's cases.

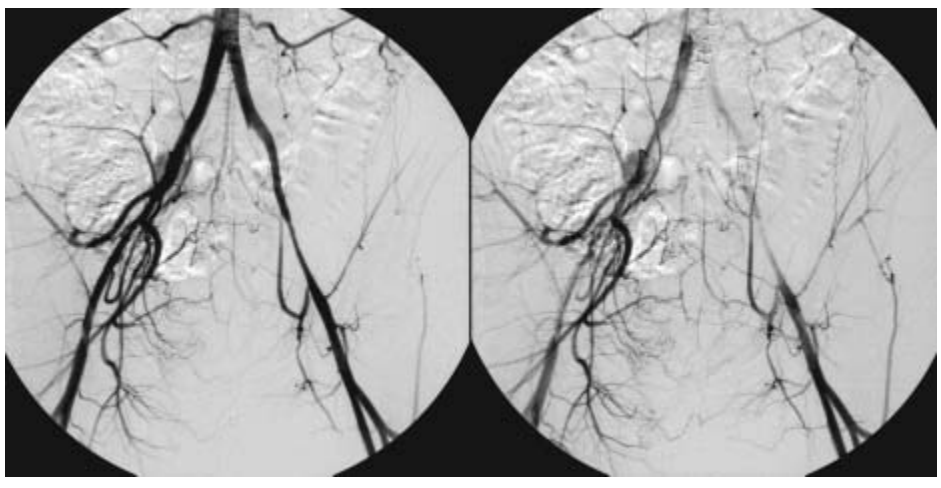
Case 1

Pelvic Hemorrhage

- 27 year old female
- Previous cervical cancer treated by surgery and nodal resection
- One year after surgery severe vaginal bleeding > 2 l





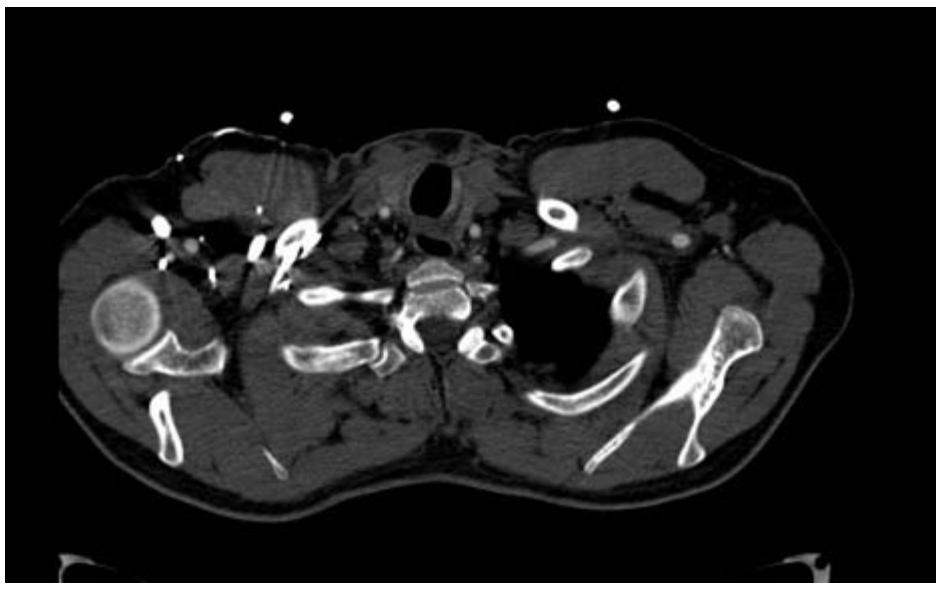


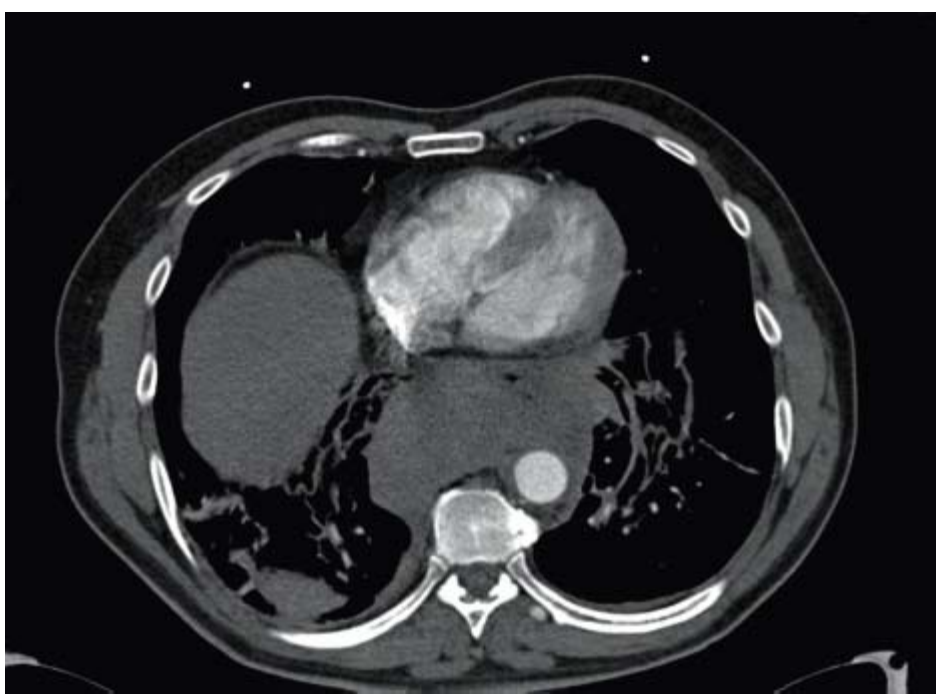
Describe the abnormalities and treatment options

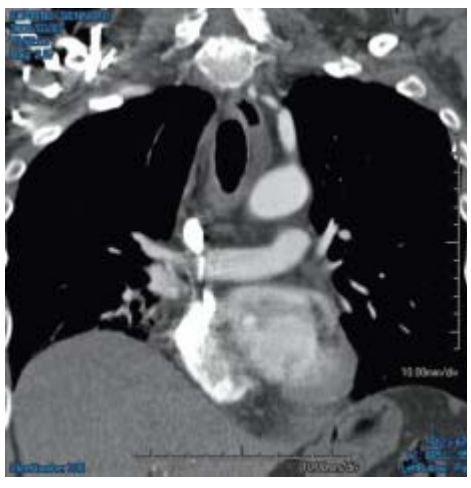
Case 2

Chest pain

- A 66 year old man was involved in a minor car accident while driving his car and wearing a seat belt.
- He suffered no injury but felt a sharp chest pain and sought medical help in the emergency room of our hospital.
- Chest X-ray revealed bilateral pleural effusion (not shown).
- A contrast-enhanced CT scan was obtained.







Selected coronal reformat of arterial phase of CT

What is your diagnosis?
Predisposing conditions?
Treatment?

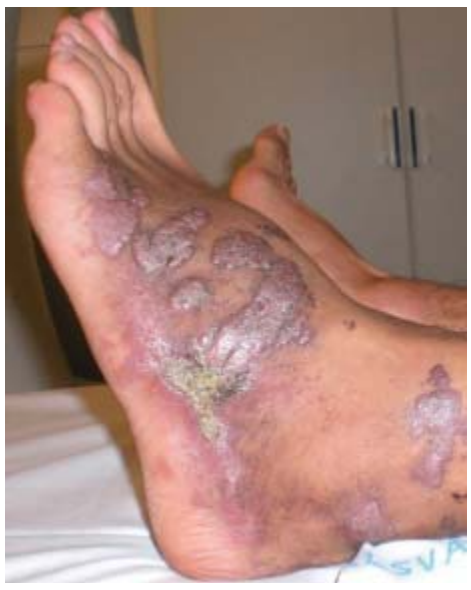
Odin vs. Thor
Monday, September 15, 15:00, Room A

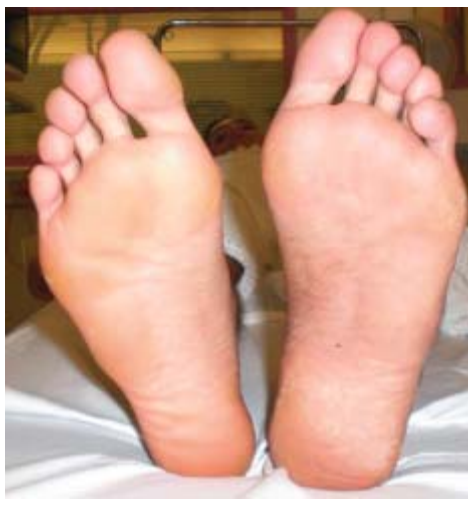
Don't miss it !
Film Interpretation Panel
Monday, 15:00, Room A

Case 3

Foot pain and ulceration

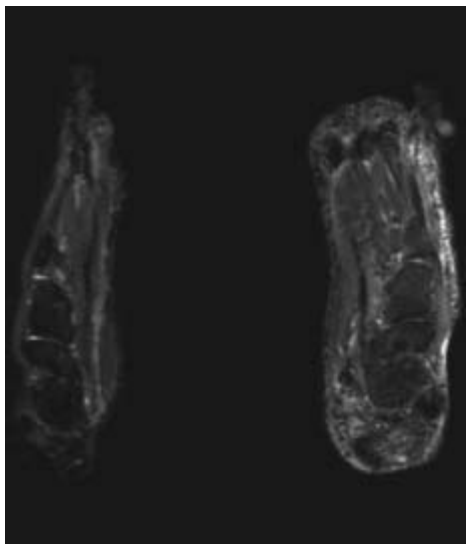
- 22 year-old male of North African origin
- The symptomatic left leg always larger than the right
- Since 2 years hypertrophic violaceous plaques
- Last 2 months increasing pain in foot and ulceration



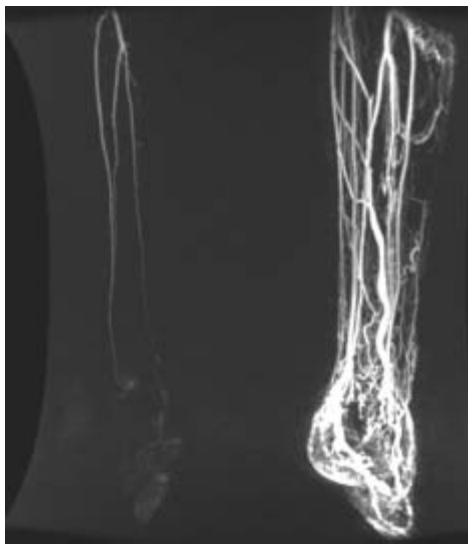


Left foot

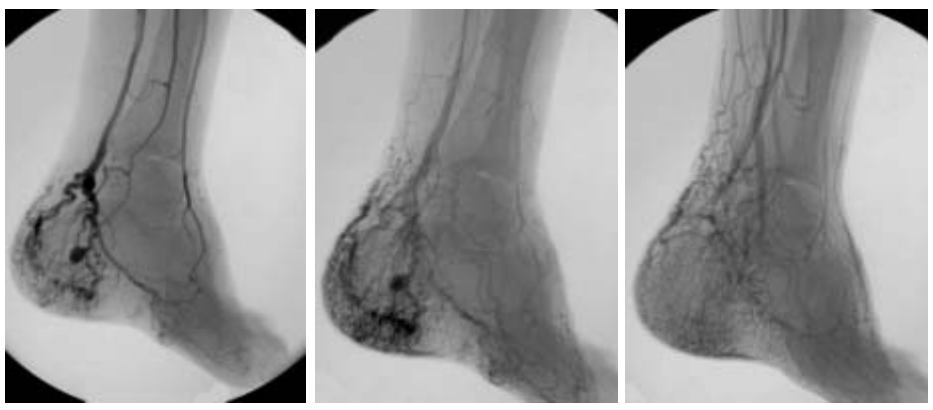
STIR



MR angio



DSA left foot

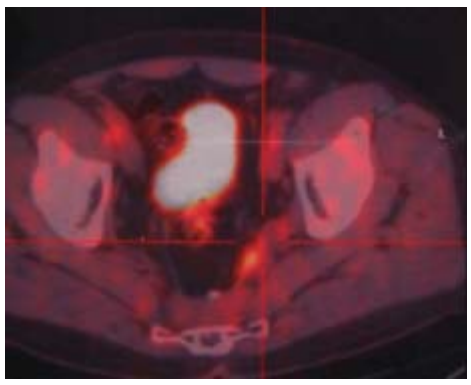


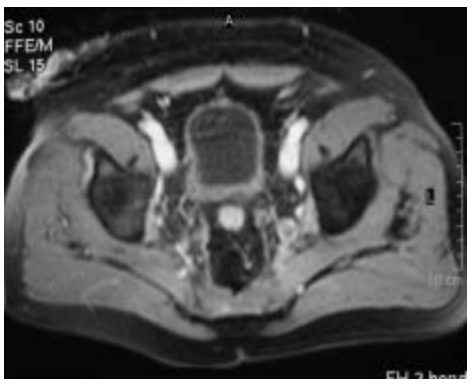
Biopsy performed
Diagnosis?
Treatment?

Case 4

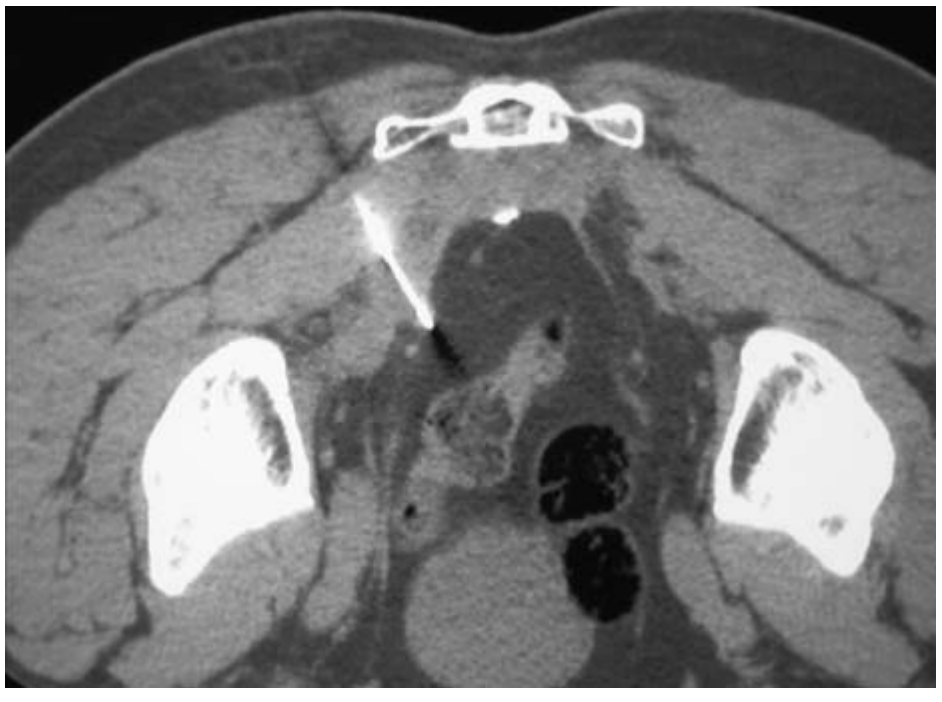
Biopsy - yes or no? That is the question

- 65 year old male
- History of rectum cancer
- One year after surgery suspicion of local lymph node metastatic disease





Biopsy yes or no?
If yes, how?



Coaxial biopsy performed with and 18-gauge needle. Jet of blood through the coaxial needle after removal of the biopsy needle.

What happened? What should you do?
Treatment options?

Gore Scientific Program at CIRSE Copenhagen, 13 - 16 September 2008

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Meet the Expert Workshops -
Gore Learning Center (Room M1)

Saturday, 13 September, 2008 | 12:00 - 14:00
Mini Advanced AAA Workshop
Participation on invitation only.

Sunday, 14 September, 2008 | 12.00-13.00
Discussing the Future of TIPS For the Treatment of Portal Hypertension

Moderator: Dr. F. Fanelli, Rome, Italy

Lessons Learned Using GORE VIATORR® TIPS Endoprosthesis
Prof. P. Goffette, Brussels, Belgium

Results of a Controlled Randomized Trial Comparing GORE VIATORR® TIPS Endoprosthesis with Banding for Cirrhotic Patients with Acute Variceal Bleeding. Current and Future TIPS Indications
Dr. A. Luca, Palermo, Italy

Sunday, 14 September, 2008 | 13.30-14.30
Lessons Learned with the GORE VIABIL® Biliary Endoprosthesis to Treat Biliary Obstructions

The Role of GORE VIABIL® Biliary Endoprosthesis to Treat Malignant Biliary Obstructions
Prof. W. van Steenbergen, Leuven, Belgium

Technical and Clinical Results Using GORE VIABIL® Biliary Endoprosthesis - A 6 Years Experience
Dr. F. Fanelli, Rome, Italy

Monday, 15 September, 2008 | 12.00-13.00 and 13:30 - 14:30
The Role of GORE VIABAHN® Endoprosthesis - Endoluminal SFA Bypass for Treating Complex SFA Lesions - A Critical Debate of Burning Topics

Moderators: Dr. R. Nymann, Uppsala, Sweden, Dr. A. Rampoldi, Milan, Italy

Dr. R. Chopra, Chicago, USA
Dr. R. Kruse, Den Bosch, The Netherlands

Tuesday, 16 September, 2008 | 12.00-13.00
Endovascular Treatment of Popliteal Aneurysms: Tips and Tricks, Lessons Learned

What do Long-Term Data Tell us About the Use of GORE VIABAHN® Endoprosthesis for Endovascular PAA Treatment?
Dr. E. Verhoeven, Groningen, The Netherlands

Indications, Contra-Indication, Lessons Learned Using the GORE VIABAHN® Endoprosthesis for Endovascular PAA Treatment
Prof. M. Maynar, Las Palmas, Spain

Case Review Session -
Gore Learning Center (Room M1)

Sunday-Tuesday, 14-16 September, 2008
Bring your own case and consult the experts at the Gore learning center! Meet with the experts directly after the workshop to discuss your case and to get direct advice. You might win a scientific voucher of 250 EUR. Please bring your case on CD or memory stick.

Sunday (TIPS, BILIARY)	**14.30-15.30**
Monday (SFA)	**13.30-14.30**
Tuesday (PAA)	**13.30-14.30**

Gore Satellite Symposium -
Room C

Monday, 15 September, 2008 | 8.00-8.20
Long-Term Results of Total Endoluminal SFA Bypass with the GORE VIABAHN® Endoprosthesis

Moderator: Dr. E. Verhoeven, Groningen, The Netherlands

GORE VIABAHN® Endoprosthesis - An Endoluminal SFA Bypass and the Future Role of the Heparin Bioactive Surface
Dr. R. Chopra, Chicago, USA

A New Controlled Randomized Trial to Compare GORE VIABAHN® Endoprosthesis with Bare Nitinol Stents for Long SFA Lesions
Prof. J. Lammer, Vienna, Austria

For Meet the Expert Workshop reservation please visit the Gore booth at CIRSE.

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CIRSE Initiative for UFE Patient Information

The UFE dedicated website www.uterinefibroids.eu provides detailed information on fibroids, treatment options and UFE and is intended to make this highly successful non-surgical procedure more widely known among patients and referring doctors in Europe.

As so often with medical treatments, and particularly with innovative treatment methods, their availability and practice varies widely across Europe. UFE is now an accepted alternative treatment to hysterectomy and myomectomy in a good number of countries in which it is readily accessible to many patients. However, in other countries its status is yet to be determined, with some countries offering no UFE treatment at all to date.

Similarly, the information available online in the multiple European languages differs greatly with excellent websites available in some languages, principally in English, and a total absence of information in others. Whilst enhancing traffic to existing websites through selected links, www.uterinefibroids.eu will first and foremost seek to provide information in languages in which information on UFE is currently lacking.

Should you be willing to contribute UFE related content or links to existing websites in your national language, please contact us at info@cirse.org.

More stuff you should know about Denmark

Petra Mann
CIRSE Office

Greenland - the land where your drink needs no ice cubes

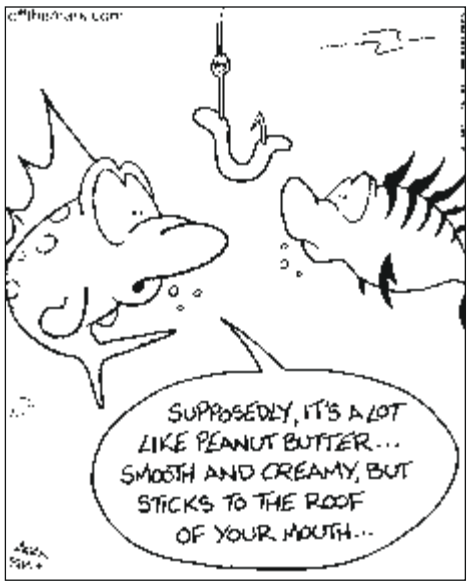
Greenland is defined as a self-governing Danish province (whatever that means) and is mostly known for being, well, bloody cold - with an average annual temperature of -11°C even the toughest nipple will stand to constant attention. Apart from cold, Greenland is also immensely huge; it comprises roughly 2,000,000 km^2. Discounting 81%, which are covered by the Greenland ice sheet (The name Iceland was probably already trademarked), that still leaves 7km^2 for each of its 56,000 inhabitants. I guess my point is that they must have really big back yards or a lot of golf courses or something.

Although historically linked to Denmark, Iceland and Norway, Greenland is ethnically associated with North America, the majority of Greenlanders being of Inuit origin. It is common knowledge that Inuit languages will have up to 20 words for different types of snow, but what is less known is that Western Greenlandic, for example, has immensely long words which can sometimes express what other languages need entire sentences for. So when two Greenlanders speak about last night's TV programme, you might hear one of them say Aliikusersuillammassuaanerartassagaluarpaalli, expressing his disagreement about the qualities of an entertainer. The most interesting fact you should know about the Inuit culture, however, is that they kiss with their noses, so if you do go there you might want to reconsider that nose job.

Danish Food
Or: When does love for herring become too intense?

As in the other Scandinavian countries, Danes eat a lot of meat. Frikadeller and karbonader are popular dishes of fried meatballs with gravy, and although eating marinated reindeer sounds like something you would have to do on Fear Factor, it is actually worth a try.

Of course the Danes would not be a sea-faring nation if they did not also eat a fair share of fish on their smørrebrød. Marinated herring and smoked eel are some of the specialties and are a common sight at breakfast buffets. Although it was not a culinary experience I had hoped I would ever make, having fish for breakfast is not all that bad and most Danes will insist that it is the best hang-over cure (not that any of us would ever need such a thing).



Another Copenhagen classic are hot dogs with røde pølser (red sausages), which are sold in little hand-pulled carts around the city. If you're feeling a little frisky, go up to one and ask for a hot dog "med det hele", which will get you the works for your street meat.

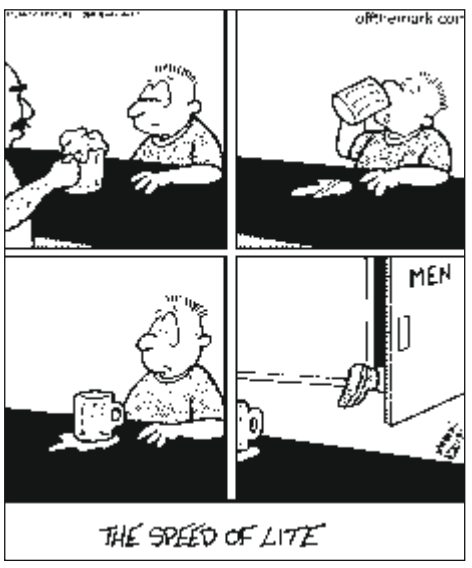
You will see that in terms of restaurants Copenhagen really leaves nothing to be desired. It offers a wide range of exquisite establishments, 11 of which have been awarded Michelin stars. The Noma Restaurant has recently even been awarded a second star, so if you can get a reservation (for 2011, that is), do go there! I must warn you though: upon receiving your check you might have to part with the idea that both of your children will go to college.

Danish Beer

Denmark is the European country with most breweries per capita - around 60-70 in total, many of which are located in Copenhagen and offer guided tours followed by a tasting of the establishment's products. Incidentally, this is where I say good-bye to my male audience.

Until recently the Carlsberg brewery virtually held a monopoly on the Danish beer marked, during which it acquired many local breweries and shut them down in order to increase its market shares. Angered by this development, a consumer movement called Danske Ølentusiaster ("Danish Beer Enthusiasts") was founded in an Odense pub in 1998. I daresay that the founding fathers of this illustrious society were as intoxicated as a sailor on leave, which explains the movement's great success. Today the society boasts almost 11.000 members, holds two beer festivals per year and has achieved an outstanding revival of beer variety throughout Denmark, which of course explains why Copenhagen is one of Europe's most popular conference destinations.

For more information go to www.ale.dk or consult the closest pub for an immediate sampling.



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1. Duda SH. SIROCCO II. Long-term results of stenting TASC C lesions in the SFA. Presented at EURO PCR 2007. 2. Scheinert D. Long-term outcomes of endovascular treatment in the SFA. Presented at CIRSE/TCT 2007. 3. Ponec D, Jaff MR, Swischuk J, et al. J Vasc Interv Radiol 2004;15:911-18. 4. Duda SH, Bosiers M, Lammer J, et al. J Vasc Interv Radiol 2005;16:331-8. 5. Duda SH, Pusich B, Richter G, et al. Circulation 2002;106:1505-9. 6. Scheinert D. Strut fracture in different self-expanding nitinol stents: a prospective evaluation (The FESTO study). Presented at TCT 2004.

*Cordis data on file

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