

CIRSE 2015 – Lisbon
Monday, September 28, 2015

Can you handle the risk?

Following the great success of the pilot project at CIRSE 2014, the Radiation Protection Pavilion returns at CIRSE 2015! It again features a wide range of information materials, but has branched out even further: take the radiation protection quiz, try out the cutting-edge simulators, or attend one of the scheduled mini-talks. But most importantly: don't forget to take part in the prize draw! You'll find more info on how to take part below...

While interventional radiology has revolutionised medicine, offering a minimally invasive solution to myriad pathologies, it is not entirely without risk. One of the greatest risks facing both patients and practitioners is the increased exposure to ionising radiation that comes with CT- and fluoroscopy-guided interventions.

While measures rightly exist to ensure that patient exposure is kept as low as possible (such as the ALARA principle), the repeated low-level exposure can have a cumulative effect on the health of the interventional radiologist. This can manifest itself in a number of ways, but most commonly, as damage to the lens of the eye.

Eye checks

To help both counteract this phenomenon and study it further, CIRSE's Radiation Protection Pavilion is offering members free lens opacity screening. Two qualified ophthalmologists will be onsite during the congress to perform the screening. All members received an email inviting them to pre-register, but there may still be some free slots or last-minute cancellations: please call by the Pavilion if you are interested in having your eyes checked.

Expert advice

Learn about the health hazards linked to high levels of occupational exposure to radiation – consult our best practice guides and information material, or take a seat and listen to a brief talk hosted by our Subcommittee or industry partners. Today's talks include:

- Assessment of clinical occupational dose reduction effect of a new interventional cardiology shield for radial access combined with a scatter-reducing drape.
- Radiation safety: is my cath lab doing enough?
- Simultaneous tracking of patient and real-time staff dose to optimise interventional workflow
- Robotic catheter assistance: the relationship on radiation exposure
- Radiation safety: how to keep your staff safe

The Pavilion also offers a number of take-home information materials: call by and see what improvements your department could make!

Interactive learning

To get you actively involved, the Pavilion is offering some new features to train and test

your radiation protection skills. One is the Radiation Protection Quiz, where you can test your knowledge. This quiz is available online through the CIRSE App, or you can scan one of the QR codes onsite. Test yourself to see if you need to learn more; or use it after your visit to see how much you've learned – or both!

A state-of-the-art radiation safety simulator will also be available, offering visitors a chance to get some hands-on learning done.

Naturally, you also have the opportunity to discuss the latest protective technologies with some leading industry partners, who will have their info-booths located right in the Pavilion.

CIRSE's Radiation Protection Subcommittee

The Pavilion has been instigated and executed by CIRSE's Radiation Protection Subcommittee, under the leadership of Prof. Werner Jaschke. The Subcommittee was established in 2012, and alongside the "Do you see the risk?" awareness campaign and the Pavilion, has participated in the European Tenders on Medical Radiation Protection Education and Training (MEDRAPET) and Referral Guidelines, as well as the ESR's EuroSafe Imaging Campaign.

For more information, check out the CIRSE App, the Pocket Guide, or simply call by the Pavilion, located in Exhibition Hall 1. If you have any questions, please contact CIRSE's Research & Analytics Department (tkalec@cirse.org)

Prize draw

To help you get started in improving your department's radiation safety, we're giving away some great prizes. Taking part is simple: to be in with a chance of winning, all you have to do is complete the sticker that's been handed out with each copy of Congress News.

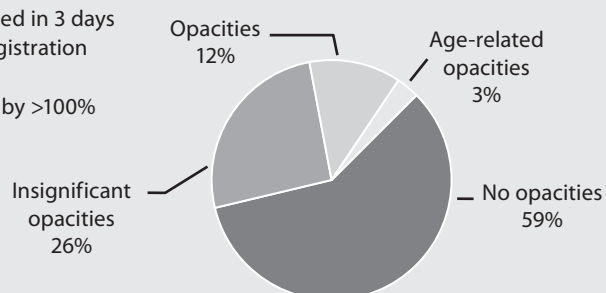


As you can see, the radiologist on your sticker isn't taking the proper precautions. Get him properly kitted out like the radiologist above by visiting any of the RP Pavilion exhibitors: they will provide you with the missing part, which you can peel off and add to your sticker; the backing card acts as your "ticket". Simply fill in your name, ID number and email address, and hand it in. Pop the completed sticker on your jacket or congress bag to show everyone that you can "handle the risk"!

Popularity at CIRSE 2014

- Exclusive service to CIRSE Members
- Total of 97 eye checks performed in 3 days
- Pre-registration and on-site registration possible
- Demand exceeded availability by >100%

Eye-check results (n=97)



Today's Radiation Protection Pavilion Mini-Talks

11:00 – 11:15

Industry presentation – MAVIG

Assessment of clinical occupational dose reduction effect of a new interventional cardiology shield for radial access combined with a scatter reducing drape.

P. Gilligan (Dublin/IE)

tbc

Industry presentation – RAYSAFE

tbc

12:30 – 12:45

Radiation safety: is my cath lab doing enough?

E. Vano (Madrid/ES)

12:45 – 13:00

Industry presentation – PHILIPS

Simultaneous tracking of patient and real time staff dose to optimise interventional workflow

S. Boon (Best/NL)

13:00 – 13:15

Hybrid operating room or hybrid procedure? Staff safety

G. Bartal (Kfar-Saba/IL)

14:00 – 14:15

Industry presentation – HANSEN

Robotic Catheter Assistance: The Relationship on Radiation Exposure

B.T. Katzen (Miami, FL/US)

14:15 – 14:30

Radiation safety: how to keep your staff safe

G. Paulo (Coimbra/PT)

Join us today and learn how you can better "handle the risk"!



A once-in-a-lifetime opportunity: join us for the

X-Session

To celebrate the 30th birthday of CIRSE, six former presidents will join outgoing president Anna Belli and incoming president Elias Brountzos, to share their most formative IR experiences.

Dierk Vorwerk | *CIRSE President 2000-2001*

Andy Adam | *CIRSE President 2002-2005*

Johannes Lammer | *CIRSE President 2006-2007*

Jim Reekers | *CIRSE President 2008-2009*

Jan Peregrin | *CIRSE President 2010-2011*

Mick Lee | *CIRSE President 2012-2013*

30 years of CIRSE, 30 years of hydrophilic guide wires: a lucky coincidence

Food for thought: the ongoing evolution of patient guidelines

Flops and tops

The wrong man at the right time

The long and winding road to interventional radiology and CIRSE presidency

Turning darkness into light

Find out what spurred on these leaders in the field of IR, and what has helped shape their career.

Monday, 14:30-15:15, Auditorium 1

Techniques and complications management for SFA treatment

Maria Antonella Ruffino

In recent years, technological advancements have made it possible to offer endovascular treatment for femoro-popliteal lesions to a growing number of patients with peripheral atherosclerotic disease (PAD), but several issues related to superficial femoral artery (SFA) treatment persist. SFA still remains the most challenging peripheral artery in which to obtain long-term patency despite the increasing number of endovascular tools available.

Performing endovascular interventions on SFA lesions requires particular knowledge of its unique anatomic characteristics in order to achieve high success rates. The SFA is one of the longest arteries (25 cm long), and at its origin is located superficially, then goes deeper to enter the Hunter channel, where it continues as the popliteal artery. This particular anatomical condition exposes the artery to high flow resistance and makes it very prone to occlusion. Usually, thrombus stratification begins at the distal SFA part, and can predispose a patient to proximal thrombosis growth, with consequent luminal stenosis and occlusion. Thus, the SFA has very few collateral branches: when occluded, distal collateralisation is mainly supported by the deep femoral artery (DFA), but, when stenotic, the SFA can become a source of collaterals.

Defining standard practice for interventional procedures involving the SFA may be difficult. Endovascular treatment is currently recommended for the majority of symptomatic lesions of the SFA artery, the most common in patients with PAD. Currently, there is no single option for the best treatment. The applicability of most procedures depends on operator preference, device availability and costs.

'Plain old balloon angioplasty' (POBA) remains the primary treatment recommended by the American College of Cardiology's and the American Heart Association's (ACC/AHA) guidelines for the management of patients with femoro-popliteal PAD, with stents used only as salvage therapy in case of suboptimal or failed results from balloon dilatation. POBA still represents the first-line treatment at many

institutions. It has been demonstrated that POBA results are superior to medical therapy alone, with good results especially in short lesions and in segments prone to movement angulation, in which a stent may not perform as well in terms of clinical benefits.

Balloon-expandable metal stents are no longer used in the femoro-popliteal artery, because of the risk of external compression and longitudinal deformation under torsion, flexion and extension conditions. As substitutes, bare nitinol stents (particularly the new generation of closed-end interwoven nitinol wire stents), drug-eluting stents (DES), covered stents, and drug-eluting balloons (DEB) have emerged to improve long-term patency, while laser angioplasty, cryoplasty balloons, cutting balloons and a number of atherectomy devices may help to improve recanalisation of the vessel. DEBs have the potential to improve the benefit of traditional POBA by delivering an anti-restenotic agent to the peripheral arteries while avoiding a permanently-implanted metallic scaffold. There are specific balloons for femoro-popliteal disease, coated with paclitaxel, a natural cytotoxic anti-proliferative agent that blocks intracellular micro-tubular formation with inhibition of smooth muscle cell division, migration and proliferation.

Unfortunately, there is still conflicting evidence on the efficacy of DEBs in the SFA. The effectiveness of drug delivery has been questioned, especially in heavily-calcified lesions, suggesting that other therapeutic alternatives should be evaluated for such situations. Calcified lesions may resist POBA even if performed with high RBP balloons; the use of atherectomy has been proposed as an alternative to POBA, such as with cutting balloons or semi-compliant balloons with an external nitinol shape-memory helical scoring edge. Other ways to reduce the plaque and calcium burden are provided by atherectomy devices, using photo-ablation, excision or abrasion to remove plaque from the lumen, thus avoiding the barotrauma of the POBA and the use of stents. Atherectomy is often used as a plaque modifier rather than a stand-alone technique, and recently its use has been proposed before

the use of drug-eluting balloons. Since the most common complication using these devices is embolisation in the distal circulation, the preventive use of a filter has been suggested, especially in case of compromised run off.

As stent use continues, reports of intra-stent restenosis have begun to emerge, raising questions about the durability of these metallic implants, which seems particularly problematic. Based on the dramatic efficacy of anti-proliferative drug coating on coronary stents, and despite the initial failure of similar devices in the SFA, it has been hypothesised that DESs may offer higher patency rates in the peripheral circulation. DES trials have shown discrepant results with different stent platforms, but evidence from meta-analyses of RCTs on femoro-popliteal endovascular therapies suggest that DES with paclitaxel may entail the lowest vascular restenosis rate. Covered stents may play a role in endovascular treatment of long and challenging arterial lesions, their fabric covering the stent to prevent in-stent restenosis. The limit of this technology is the risk of occlusion of collaterals that may be patent in stenotic lesions, and are usually present at the level of arterial re-constitution below a total occlusion.

A recent meta-analysis suggests the use of an endoprosthesis for SFA occlusion disease is an effective and safe treatment option for long *de novo* lesions; nevertheless, large differences in patient and lesion characteristics, medical therapy and developments in stent-graft design complicate comparisons between studies. The bioabsorbable stents with late re-absorption, discontinuing the long-term stimulus leading to neointimal formation, appear encouraging. New bioabsorbable scaffolds made of resorbable polymers (poly-L-lactic acid) or metal alloys (magnesium), with or without anti-proliferative drug elution, are being manufactured. The drawbacks of this technology include the unsatisfactory mechanical properties of the bioabsorbable materials; current stents are balloon expandable (which are not indicated in the SFA segments), and these scaffolds show a poor outward radial force in comparison to nitinol

Don't miss it!

State-of-the-art SFA interventions
Special Session
Monday, September 28, 08:30-09:30
Auditorium 1



Maria Antonella Ruffino
San Giovanni Battista Hospital
Turin, Italy

Dr. Maria Antonella Ruffino works in the Vascular Interventional Radiology Department at San Giovanni Battista Hospital. Dr. Ruffino's interests include vascular interventions, interventional oncology and transcatheter embolisation. Dr. Ruffino has delivered lectures at various CIRSE events, including CIRSE 2010, CIRSE 2011, CIRSE 2013 and GEST 2013 Europe, covering topics such as endovascular repair of peripheral and visceral aneurysms, the controversial role of multilayered stents in aortic aneurysm, and transcatheter embolisation.

stents. Despite the initially promising results, data of long-term clinical and angiographic findings in the femoro-popliteal arteries are scarce.

As we can see, there is some overlap among these new technologies and their potential use, and the results may vary. Outcomes may depend on the clinical presentation of the treated patients or on anatomical features, such as the site and length of the diseased vessel. An important variable when analysing clinical outcomes of femoro-popliteal interventions relates to the rapidly-evolving endovascular technologies, as well as the ever-changing field of treatment modalities.

Caution should be used when evaluating the true benefits and efficacy of the advanced technologies used in SFA treatment, given the lack of large randomised controlled trials demonstrating the superiority of one device over the other and their durability over the time; the limited follow-up data; and the continuously developing technology.

ESIR 2015 Course

Fundamental Course DVT & Pulmonary Embolus Dublin (IE), November 27-28, 2015

Both vena cava filter placement and thrombolysis/thrombectomy for ilio-femoral DVT are becoming more widely used throughout Europe.

This course will address the evidence in both of these areas, provide practical help in decision-making, and offer hands-on experience of the different retrievable filter types and thrombectomy devices. It will also address the role of IR in chronic venous occlusion.

Ideally, participants should be either IR fellows-in-training or interventional radiologists who wish to expand their knowledge in these areas. The course entails practical teaching, hands-on sessions and case-based discussions.

Early Bird fee available until October 2!

www.cirse.org/esir2015



CIRSE foundation

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To discuss a project idea, please contact our team at research@cirse.org.

Renal ablation and nephron-sparing surgery: the evidence

David Breen

It is often argued that we are simply seeing increasing numbers of small indolent renal tumours due to the profligate use of clinical imaging and that this disease is of no clinical consequence. We should start by tackling this assumption and, importantly, putting this issue from the patients' point of view, before moving on to the relative merits of ablation and nephron-sparing surgery.

Many of these tumours are indolent and slow-growing (~3 mm/year on average), yet some 10-20% are of higher metastatic risk, and as yet we have no substantive markers to pick out this subset. These tumours are usually detected in the setting of some degree of background chronic renal impairment and often in older patients of ~65 years and above. Biopsy characterisation is increasingly mandated in all but a frail, older age group, as some 20% of sub-4 cm (T1a disease) masses will prove to be benign. Active surveillance (AS) is often invoked, but some 1-6% of renal cancers [1] can metastasise even at less than 4 cm in size. Of note, on a per case basis, renal carcinoma remains the most lethal of all the urological cancers. Finally, radiologic AS is not without its own costs and (psychological) morbidity in the older, fit patient; many patients ask to cross over from surveillance to active treatment (reckoned at some 40% by the European Association of Urology), particularly on being made aware of the less invasive option of image-guided renal tumour ablation.

Renal tumour ablation only appeared, in its earliest forms, in clinical practice in the mid-1990s and, as is the way of interventional radiology, it has continued to evolve rapidly over the last 20 years in terms of ablative devices, adjunctive manoeuvres and accurate image guidance. All these factors bear on the available data and, given the indolence of the disease, longer term oncologic data, largely using dated radiofrequency devices (RFA) and

image-guidance techniques, has only started to be published in the last few years. It should also be borne in mind that when a disease is aggressive (in terms of its Kaplan-Maier survival curves), it is easier to more quickly distinguish useful therapies yielding oncologic impact from those that are not. Small, sub-5 cm renal cancer is more indolent (the essential remit of image-guided ablation), and therefore it can be difficult to discern oncologic differences between different techniques, particularly when those techniques are changing year on year. Image-guided ablation must therefore look to demonstrate non-inferiority and importantly significant benefits in terms of cost-effectiveness and reduced complications.

So: what is the evidence? It is essentially based on large-volume retrospective case-cohort series showing non-inferiority. Olweny [2] and the University of Texas Southwestern group looked at 140 patients with solitary RCC (renal cell carcinoma), 84 to RFA and 56 to partial nephrectomy (PN), at a median of 6-year follow-up. Cancer-specific survival (CSS) and recurrence-free survival (RFS) were statistically equal in the two groups, but this was non-randomised, with the RFA group being older and more co-morbid. Houston Thompson and the Mayo Clinic Group looked back over 1,057 PN, 187 CRA (cryoablation) and 180 RFA from the mid-late 90s to the mid-2000s. The local RFS was similar between the three groups (p=0.49), but of note the metastasis-free survival (MFS) was significantly better after PN and CRA when compared with RFA, likely reflecting possible ablative weaknesses of RFA. Interestingly, even in the T1b (4-7cm) subset (326 to PN and 53 to CRA), local RFS and MFS were similar for PN and CRA, perhaps reflecting the robustness of CRA in larger tumour treatments. Again the longevity of the data can be criticised – even in the experienced Mayo Group practice – as the median follow-up,

whilst 5 years for PN, was only 2.9 and 1.4 years for RFA and CRA, respectively.

The Boston Group RFA data was also published in 2013 [4]. Of 185 patients with biopsy-proven RCC treated by RFA – median size 30 mm, median follow-up 6.4 years – 6.5% local recurrence was noted at a median of 2.5 years with 88.6% disease-free survival. They concluded "in poor surgical candidates (the group to whom RFA were offered) RFA results in durable local control and a low risk of recurrence in T1a RCC". The SEER database in North America is also increasingly testifying to very similar 5-year DSS of 98.3% versus 96.6% for surgery and ablation, respectively, obviously at lower cost and with less complications. It was also noted that there was absolutely no difference in treatment outcomes when DSS for PN was compared with image-guided ablation from 2007 and beyond. This no doubt reflects improvements in devices and IR technique in more recent years.

Finally, I would draw attention to a meta-analysis of surgical nephrectomy versus renal tumour ablation from Katsanos and the King's London Group, published in CVIR in 2014 [6]. Six trials were analysed – only one notably randomised and, unusually, looking at microwave versus PN – for a mean overall tumour size of 25 mm. They found DFS similar (HR=1.04, p= 0.92), significantly less complications for ablation (p=0.04) and a reduction in eGFR considerably higher following PN (p=0.03). It should be added that a number of costing analyses have also clearly illustrated the cost-effectiveness of ablation compared with PN [7-9].

The evidence for the oncologic effectiveness, and certainly the non-inferiority, of renal tumour ablation is clearly accruing. Once again, however, IR is victim of its own rate of innovation and practice change, with devices

Don't miss it!

Management of renal malignancies
Special Session
Monday, September 28, 08:30-09:30
Room 5.A



David J. Breen
Southampton University
Hospitals Trust
Southampton, UK

Dr. David Breen is internationally renowned for his work using microwave thermal ablation and cryoablation to treat abdominal cancers. His main interest is in abdominal and interventional radiology, with particular focus on image-guided ablation. He is past-president of the British Society of Gastrointestinal and Abdominal Radiology, and sits on a number of mind-numbing committees.

and outcomes continually changing and improving, but the time curve for oncologic outcomes lagging behind these innovative changes. Oncologic equipoise for IGA versus PN is increasingly evident but perhaps in the absence of randomised data, and in these austere times, we would do well to also look at cost-effectiveness as another way of illustrating the merits of this technique. Nevertheless something tells me that in the next decade, renal tumour ablation will become the standard of care for sub-4 cm renal cancers.

References:

1. Abbou Yousif et al. Cancer (2007) 110:1010
2. Olweny E et al. Eur. Urology. (2012) 61:1156
3. Houston Thompson R. et al. Eur. Urology (2015) 767:252
4. Psutka SP et al. Eur Urol. (2013) 63:486
5. Whitson JM et al. BJUI (2012) 110:1438
6. Katsanos K et al. CVIR (2014) 37:427
7. Castle SM et al. Urol. Oncol. (2013) 31:1327
8. Froglin et al. BJUI (2013) 112:e322
9. Link RE et al. J. Endourol (2006) 20:782

ESIR 2015 Course

Expert Course

The Future of Image-Guided Tumour Ablation – Targeting Techniques and High-End Clinical Strategies

Innsbruck (AT), December 11-12, 2015

This course brings together seasoned interventional radiologists to scrutinise the latest image-guidance systems and ablation methods.

Featuring a live case, product overviews and workshops examining individual imaging systems and discussing ablation devices, as well as forward-looking round-table discussions focusing on improving outcomes, the course promises to appeal to experienced practitioners dedicated to both shaping and further developing the future of interventional oncology.

Early Bird Fee available until October 16!

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MEDTRONIC SESSIONS LET'S GO FURTHER, TOGETHER

Date: Monday, September 28, 2015
Time: 13:00-14:00
Room: Auditorium 6

FROM STRAIGHTFORWARD TO COMPLEX:

Review of IN.PACT™ Admiral™ DEB Evidence in
Challenging Clinical Scenarios

Chairman and Moderator: D. Karnabatidis, Greece - P. Krishnan, US

- DCB Effectiveness in Long SFA Lesions: Results from IN.PACT Global Study and Imaging Cohort
G. Tepe, Germany
- DCB Effectiveness in Long SFA Lesions: Experience and Clinical Evidence from an Independent Study
A. Micari, Italy
- Beyond Long SFA Lesions: Do Current Results Encourage Further Expansion of Indications?
K. Katsanos, UK
- Success with DCB: Important Technical Considerations
P. Krishnan, US
- Open discussion and take home messages

Date: Tuesday, September 29, 2015
Time: 13:00-14:00
Room: Auditorium 1

ENDOVASCULAR TRAUMA MANAGEMENT AND ENDOLEAK MANAGEMENT

Chairman and Moderator: MD PhD. J. Urbano, Spain

- Endovascular Trauma Management
T. Horer, Sweden
- Embolization in Emergency Settings, How to Treat?
G. Carrafiello, Italy
- Endoleak Type I and II Management
R. Morgan, UK



Factors influencing patient satisfaction

Trevor Cleveland

In 2011 there were 15 million admissions to NHS hospitals in England and Wales. Each of these represents an episode of experience for a patient, and linked to the admission are many more interfaces in an outpatient setting. The NHS Operating Framework 2012/13 specifically states that the NHS should collect and use patient experience information in real time and use it for service improvements. NHS organisations are expected to actively seek out, respond positively to, and improve services in line with patient feedback. This includes acting on complaints, patient comments, local and national surveys, and results from 'real-time' data techniques. In the UK there is a CQUIN Framework (Commissioning for Quality and Innovation Scheme), which enables commissioners to financially reward excellence, by linking a proportion of English healthcare providers' income to the achievement of local quality-improvement goals. The NHS Constitution reinforces the need for patient-centred care.

Clearly only a small proportion of overall admissions to hospital are primarily for interventional radiology procedures, but IR is a part of many more healthcare episodes. In many instances, patients admitted to hospitals primarily for interventional radiology procedures (be those day cases or longer term care) are not admitted under the care of an interventional radiologist, but often a surgeon, physician, gynaecologist and/or a variety of others.

Our training and focus, as image-guided procedures are our stock in trade, is aimed at achieving excellent technical interventions. Whilst patients certainly want successful procedures, they also want these enveloped in a good experience throughout their care.

Thus, what we may consider to be paramount (procedural outcomes), patients may be prepared to compromise on, so long as other factors are addressed. Thus we have to consider, whilst accepting that we will not be able to please all the people all of the time, which factors influence satisfaction, in what ways we

can measure the level of satisfaction, and what we can do to improve it.

The patient journey may be a long one, or it may be short in the case of emergency care. Interventional radiology is directly involved in both extremes. Thus we need to consider the entire process, potentially including waiting lists, the hospital/ward, doctors and nurses, care and treatment, and what happens to patients after they leave the hospital.

Some (or many) of the stages above may seem to be at some distance for interventional radiologists. However, if a patient has one of our procedures performed, other factors may be seen as the over-riding one. Thus if a patient is happy, they will describe their procedure (EVAR, biliary drainage, ureteric stent) as being satisfactory. They will not say "my angioplasty was great", they will say "the ward toilet was dirty". Thus it is important to the perception of IR procedures that interventional radiologists embrace and take an active (or leading) role in as many of these areas as possible.

As far as the procedure itself is concerned, it is vital that the expectation of that procedure is managed, and set at appropriate levels. How often have many of us been in multidisciplinary team meetings, where it has been said, "Mr. X is not fit/suitable for an open procedure, therefore we must try an endovascular approach"? This may be the only active treatment option for Mr. X, but unless he understands the potential risks, limitations and alternatives, should the risky procedure fail, he will be disappointed. On the other hand, if there is a realistic understanding that there is little alternative, then a good outcome will be met with joy, a failure with an understanding and appreciation that an effort was made. Interventional radiology outpatient clinics provide an excellent route to ensure this is properly approached, as well as being a vehicle to a good consent process.

The first step in improving anything is to take note of the information available. This can be at a national or more local level. Taking the UK as an example, the 2008 report "High Quality

Care for All" highlighted the importance of the entire patient experience within the NHS, and of ensuring that people are treated with compassion, dignity and respect in a clean, safe and well-managed environment. Leading on from this, the NHS Constitution (2013) described the purpose, principles and values of the NHS and illustrates what both patients and staff can expect from the service. Building on this are national initiatives aimed at improving patients' experience with healthcare, and include NHS Choices, which provides patients and carers with information and choices about their care. Patient advice and liaison services (PALS) are also available in most NHS hospitals. Despite these initiatives, in the UK there remains further work to deliver the best possible experience for users. In 2012, NICE published quality standard 15, *Quality Standard for Patient Experience in Adult NHS Services*. This described markers of "high-quality, cost-effective care that, when delivered collectively, should contribute to improving the effectiveness, safety and experience of care for patients using adult NHS services".

Clearly there are organisational as well as individual motivations to improve the patient experience. In addition to these professional and altruistic motivations, healthcare systems may include a financial 'carrot' such as the CQUIN payment framework.

It is worth remembering that we do not just experience healthcare as providers and patients; we are tax-payers, we have friends and family who use it, and we read about it. Its political, cultural and social importance is reflected in the fact that, according to the Nuffield Trust, it is the second most important issue to us when we are deciding how to vote in national elections.

Interventional radiologists have not traditionally utilised out-patient consultations, both before and after procedures. If we do not, then we are highly dependent upon other clinical groups to make the first, and often lasting, impressions, and to set the level of expectations for the remainder of the care pathway.

Don't miss it!

Quality in IR
Special Session

Tuesday, September 29, 08:30-09:30
Room 5.A



Trevor Cleveland
Sheffield Teaching Hospitals/
Northern General Hospital
Sheffield, UK

Dr. Cleveland is a consultant vascular radiologist at the Sheffield Vascular Institute. He regularly performs a variety of IR procedures, including angioplasty, carotid artery stenting, embolisation, trans-arterial chemoembolisation, radio-embolisation, thoracic and abdominal aortic stent-grafting, and inferior vena-cava filter placement. Dr. Cleveland was appointed Senior Lecturer in Vascular Radiology at Sheffield University in 1995, and consultant vascular radiologist in 2000. Dr. Cleveland is a CIRSE Fellow, and served on the Local Host Committee for CIRSE 2014. He has also been a faculty member for ESIR courses.

Managing and ensuring reasonable expectations is often key to ensuring satisfaction with the remainder of the episode. It also allows for a trusting relationship to be developed with our patients, which is so vital, especially should a problem arise. If we leave the pre-procedural work up, relationships and consent to others, we expose interventional radiology to significant risk of being unable to match what others may unrealistically promise our patients.

Interventional radiology and interventional radiologists undertake procedures that in general provide significant benefits to patients, as judged by clinical assessments of outcomes. However, ultimately they will be judged by our patients in the environment of how and where these are delivered. It is simply not sufficient to deliver a technically sound and ingenious minimally invasive treatment; it is essential that we do this in a pathway that delivers a high quality patient experience. We ignore that fact, and avoid involvement in achieving it, at the peril of the perception of the procedures.

Today's Featured Papers

will be presented in the Free Paper sessions, taking place from 16:15-17:15 and from 17:30-18:30

16:15 – 17:15

FP 2205 Neuro interventions

Room 3.A

The "black hemisphere" sign in CT angiography: a reliable surrogate for poor clinical outcome in patients with acute ischemic stroke

L. De Paoli, M.P. Fürstner, K.A. Hausegger, Klagenfurt/AT

FP 2206 Liver: TARE and RT

Room 1.15

Computed tomography and magnetic resonance imaging characteristics of novel radiopaque Yttrium-Strontium-Gallium-Silicate oxide glass microspheres: potential materials for radioembolization

X. Zhang, S. Kehoe, C. Davis, E. Tonkopi, D. Boyd, C. Bowen, R. Abraham, K. Brewer; Halifax, NS/CA

FP 2207 Portal vein (BRTO) and spleen

Room 3.B

Comparison of balloon-occluded retrograde transvenous obliteration (BRTO) using ethanolamine oleate iodamide (EOI), BRTO using sodium tetradecyl sulphate (STS) foam and modified BRTO (mBRTO)

Y.H.D. Kim, Y.H. Kim, C.S. Kim, J.H. Kim, U.R. Kang; Daegu/KR

17:30 – 18:30

FP 2304 Vascular: iliac arteries

Room 5.B

AGIR study: a prospective randomized control trial comparing efficacy of Angio-Seal™ vascular closure device vs manual compression in interventional radiology
P. Vilares Morgado¹, A. Lefevre², M.A. de Gregorio³, R. Reyes⁴, T. Hernandez⁵, I. Acitores⁵, A. Mingo⁵; ¹Porto/PT, ²La Louvière/BE, ³Zaragoza/ES, ⁴Las Palmas/ES, ⁵Madrid/ES

FP 2305 Prostate

Room 3.A

Long-term results of prostatic artery embolization for patients with benign prostatic hyperplasia: 240 cases

J.M. Pisco, T. Bilhim, L.C. Pinheiro, J.A. Pereira, L. Fernandes, N.V. Costa, M. Duarte, A. Oliveira; Lisbon/PT

FP 2306 Thyroid and patient care

Room 1.15

Radiofrequency versus ethanol ablation for treating predominantly cystic thyroid nodules: a randomized clinical trial

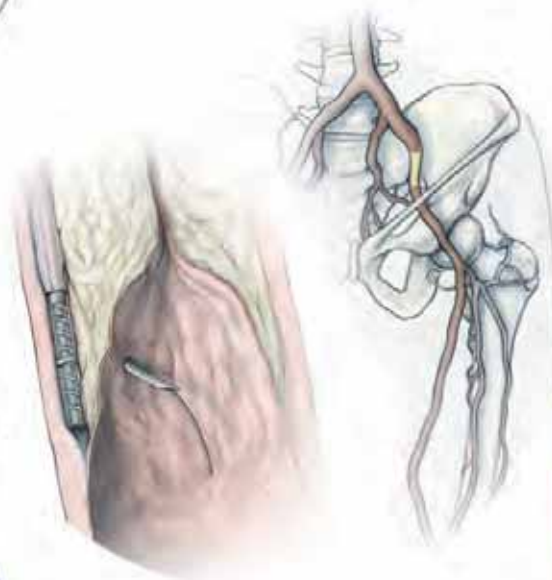
E.J. Ha¹, J.H. Baek², J.Y. Sung²; ¹Suwon/KR, ²Seoul/KR

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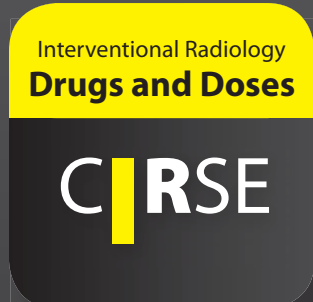
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Chairman: Dr. Fabrizio Fanelli

**Monday, September 28, 2015
 13:00-14:00 - Auditorium 2**

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BTK trials update

Hans van Overhagen (EBIR)

Critical limb ischaemia (CLI) is a limb- and life-threatening condition with a yearly incidence of around 220 new cases per million of population. Infrapopliteal arterial occlusive disease is a leading source of CLI. Especially in patients with diabetes, the risk of peripheral arterial disease is 3-4 times higher and tends to be more aggressive than in patients without diabetes; the major amputation rate is 5-10 times higher.

Primary goals of CLI treatment are relief from ischaemic pain, healing of neuro-ischaemic ulcers, prevention of limb loss, and improvement of patient function and quality of life. Some kind of revascularisation, first endovascular and sometimes surgical, is usually necessary to achieve these goals. Treatment should also be directed towards pain control, infection control, atherosclerosis control, anticoagulation and cardiovascular management.

Patients with CLI should receive cardiovascular risk reduction therapy. Antithrombotic drugs, statins and antihypertensive drugs should be administered to reduce cardiovascular events, to prevent peri-procedural complications and to increase post-procedural patency rates. Aggressive blood glucose lowering is recommended in all patients with Types 1 and 2 diabetes to reach glucose levels as close to normal as possible.

Acetylsalicylic acid (aspirin) is the standard antiplatelet therapy in CLI. Although there is not enough evidence, some authors recommend dual antiplatelet therapy of clopidogrel (75 mg/day) and aspirin (100mg/day). During the endovascular procedures, 3,000-5,000 IU of heparin is administered intra-arterially.

At present, percutaneous transluminal angioplasty (PTA) is the primary technique to consider in treatment of infrapopliteal occlusive disease. Technical success rates of infrapopliteal PTA are reported to be as high as 80-100%. Limb salvage rates after PTA vary, and depend on the clinical and anatomical extent of the disease. There are no prospective randomised trials comparing endovascular treatment and bypass surgery in patients with CLI and infrapopliteal occlusive disease. In a meta-analysis of infrapopliteal PTA for chronic CLI, results of PTA were compared with those of a meta-analysis of popliteal to distal vein bypass grafts. Primary patency of PTA at 6 months ($65 \pm 7.0\%$) and 12 months ($58.1 \pm 4.6\%$) was significantly lower than that of bypass surgery ($85.8 \pm 2.1\%$, $p < 0.05$, and $81.5 \pm 2.0\%$, $p < 0.05$, respectively),

but there was no significant difference between limb salvage at 6 months ($88.2 \pm 4.4\%$ vs. $90.9 \pm 1.9\%$) and 12 months ($86.0 \pm 2.7\%$ and $88.5 \pm 2.2\%$). By preferentially using PTA for CLI and bypass surgery for those patients not suited for PTA, 2-year primary cumulative patency rates and limb salvage rates of 60% and 76% were reported for 32 limbs with mainly TASC D classification that underwent infrapopliteal PTA. In the 82 limbs that underwent infrapopliteal bypass surgery, primary cumulative patency was 53% and limb salvage 57%. At 30 days, the mortality and complication rates were higher for all patients undergoing bypass than PTA. A propensity score analysis of 1,023 patients, of whom 262 underwent PTA and 761 surgical bypass, reported similar 5-year results for leg salvage (75.3 vs. 76.0%), survival (47.5 vs. 43.3%), and amputation-free survival (37.7 vs. 37.3%).

Drug-eluting balloons (DEB) have recently been introduced as local drug delivery-assisted angioplasty systems that are an alternative to drug-eluting stents. The theoretical advantage of these DEB is that they offer the anti-proliferative effect of local drug elution without leaving a metallic platform behind on the arterial wall. This could reduce restenosis rates and facilitate future interventions especially at anatomical sites such as the infrapopliteal bifurcations and the distal tibial arteries, where stenting is not recommended.

The first data regarding BTK treatment with a paclitaxel-eluting balloon were encouraging. A single-centre study investigating 104 patients (82.6% of whom had CLI) reported clinical improvement in 91.2% and complete wound-healing in 74.2% of patients. One-year target lesion revascularisation and limb-salvage rates were 17.3% and 95.6%, respectively. The 3-month restenosis rate was significantly lower when compared to a historical control group treated with conventional PTA (27.4 vs. 69%, respectively). In the DEBATE-BTK trial, results of DEB were compared with those of non-eluting balloons in 132 patients with 158 lesions. Binary restenosis occurred in 27% of lesions in the DEB group and in 74% of lesions in the PTA group ($P < 0.001$). Target lesion revascularisation in 18% vs. 43% ($P = 0.002$) and target vessel occlusion in 17% vs. 55% ($P < 0.001$). Only one amputation occurred, in the PTA group ($P = 0.9$). However, in the IN.PACT Deep trial, use of the IN.PACT Amphirion DEB did not result in a different treatment result for patients with below the knee CLI as compared with the use of a standard PTA balloon. Clinically driven

TLR at 12 months was 9.2% with DEB vs. 13.1% with PTA. Late lumen loss was 0.61 ± 0.78 mm vs. 0.62 ± 0.78 mm, respectively. At 6 months all-cause mortality, major amputation and clinically driven TLR was 17.7% for the DEB group and 15.8% for the PTA group of patients.

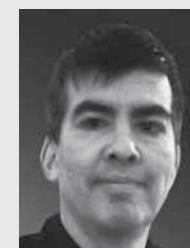
Use of bare metal stents in the infrapopliteal arteries is generally reserved for patients with residual stenosis, flow-limiting dissections or elastic recoil after PTA. A small single centre prospective randomised study with 38 limbs in 35 patients with CLI found no statistically significant difference in survival (69.3 vs. 74.7%), limb salvage (90 vs. 91.7%) or primary (66 vs. 56%) and secondary (79.5 vs. 64%) patency at 1-year follow-up after PTA or primary stenting.

Enthusiastic results have been reported regarding the use of drug-eluting stents (DES), especially sirolimus-eluting stents in infrapopliteal arteries. In the industry-initiated DESTINY trial, 140 patients with CLI were randomised to receive either a bare metal stent or an everolimus-eluting stent below the knee. Primary arterial patency was significantly higher after treatment with the everolimus vs. bare stents (85 vs. 54%), but this was only obtained in 46% of patients at follow-up. There was no difference in pain relief or limb salvage between both groups. The major amputation rate was only 3% at 12 months, which may be due to the selection of patients.

Another randomised trial that investigated the use of DES BTK is the industry initiated ACHILLES trial (sirolimus-eluting stent vs. PTA in patients with CLI and intermittent claudication). A systematic review of infrapopliteal drug-eluting stents involving the ACHILLES, DESTINY and YUKON-BTX trials with a total of 501 patients reported that at one year there was superiority of DES compared with control treatments in terms of higher primary patency (80.0 vs. 58.5%), improvement of Rutherford classification (79 vs. 69.6%), decreased TLR events (9.9 vs. 22.0%), improved wound healing (76.8 vs. 59.7%) and better overall event-free survival (72.2 vs. 57.3%). A systematic review by a different group of authors, however, reported equal efficacy of DES vs. PTA and also equal efficacy for DES vs. bare metal stents. Thus the use of DES below the knee in patients with CLI remains controversial. Finally, 6- and 12-month results of the PADI trial, PTA with bail out bare metal stenting vs. DES in infrapopliteal arteries in patients with CLI, an investigator initiated trial in 137 patients will be presented at the CIRSE meeting.

Don't miss it!

State-of-the-art BTK interventions
Special Session
Monday, September 28, 10:00-11:00
Auditorium 1



Hans van Overhagen
(EBIR)
Haga Teaching Hospital
The Hague, Netherlands

Dr. Hans Van Overhagen has worked in the Haga Teaching Hospital's Department of Radiology since 1998. He was a member of CIRSE's Standards of Practice Committee from 2011 to 2013, and the main author of CIRSE's Standards of Practice Guidelines on below-the-knee interventions (2013). In addition, he contributed to CIRSE's Quality Improvement Guidelines for Uterine Artery Embolisation. Dr. Van Overhagen, a CIRSE Fellow, teaches an ESIR course on stroke intervention, and has given presentations and led workshops at several annual meetings on a variety of topics, including bronchial embolisation, critical limb ischaemia, stroke and abscess drainage.

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Come hear the 6- and 12-month results of the PADI trial at today's session!



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European School of Interventional Radiology

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Critical Limb Ischaemia –
Diagnosis, Treatment and Parameters for Success
Amsterdam (NL), October 16-17



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CIRSE Registries – meeting the demand for high-quality outcome data

The post-market assessment of medical devices, in our case the continued data collection on interventional technologies that have been certified for use in Europe, is growing in importance. Beyond the legal requirements for continued assessment and monitoring of high risk devices, health care stakeholders are increasingly insistent on high-quality treatment outcome data. Whether scrutinising your unit's performance or discussing with a sceptical colleague or health insurer, large-scale, multinational outcome data, which may also point towards treatment aspects not yet uncovered in heavily experimentalised trials, can prove a valuable addition to the evidence base for clinical decision-making.

With the upcoming launch of CIREL (CIRSE Registry for Lifestar Microspheres), which will join CIRT (CIRSE Registry for SIR-Spheres Therapy) as the second observational study exclusively run by CIRSE, the society will set the next milestone in its efforts to conduct observational studies of the highest ethical and scientific standard. CIREL, which employs some novel research methods like centralised image analysis by an independent institution, also marks a significant expansion of CIRSE's in-house research capacities, the society now being able to and actively seeking to provide a research infrastructure for the interventional radiological space. Read on to find out more about CIRSE's new study and catch up with CIRT, which recently enrolled its 100th patient.

Meet CIREL – CIRSE Registry for Lifestar Microspheres (CIREL)

CIRSE is proud to announce that it has begun work on the second observational study to be exclusively sponsored by the society. The CIRSE Registry for Lifestar Microspheres (CIREL) will observe prospectively, throughout Europe, the administration of irinotecan-eluting microspheres, a newly CE-approved transcatheter chemo-embolisation (TACE) system. The primary endpoint is to map the exact indications which the device is being used for and at which stage in treatment it is being applied.

The study is overseen by a multidisciplinary Steering Committee which is chaired by

Prof. Philippe Pereira (Director Clinic of Radiology, Minimally Invasive Therapies and Nuclear Medicine Heilbronn) and Julien Taieb (Gastroenterology, Hopital Européen George Pompidou) and includes renowned names in oncology and surgery. Prof. Pereira is enthusiastic when asked to describe what the study hopes to achieve: "This observational study will not only provide us with robust, multicentre data on the precise use and efficacy and safety profiles of this particular device but also give some insight into how TACE can fit into the established lines of standard clinical practice in Europe."

CIREL will use an electronic data-capturing system to collect a broad spectrum of data points. The primary focus will lie on baseline patient characteristics and the precise treatment delivered. Secondary endpoints include treatment outcomes, for example in terms of objective tumour response (using RECIST and mRECIST criteria), quality of life as well as adverse events and toxicities.

CIREL will be a new departure for CIRSE, since research design will include central image analysis to be performed by an independent institution to maximise the validity of clinical data. The value of large-scale, prospective data collection in IO is clear, according to Prof. Pereira: "Continued observation of interventional oncological procedures once they are certified for use is very important practice – and not only for safety reasons. Oncologists are used to larger sample sizes than we commonly see in medical device research. Thus, large-scale, multinational outcome data can really make a difference in bolstering an evidence base and can help in showing other treatment benefits that may not have found space in previous studies, such as length of hospital stay, tumour response and quality of life."

The CIRSE Research and Analytics team is already hard at work preparing the initial registry documents and putting everything in place for launch, which is currently projected for early 2016. Prof. Pereira, who has also been an active Member on the CIRSE Research Committee since its creation, summarises why the research agenda is important for the society: "I believe it is a great achievement

that CIRSE can provide a platform that brings together these diverse medical specialties involved in interventional oncology and offer to all such a high standard of outcome research. CIREL will greatly contribute to the collection of scientific knowledge in one of interventional radiology's most dynamic and promising fields and help us understand better what is the best way to treat patients with transarterial chemo-embolisation."

CIRT – hundredth patient milestone passed

CIRSE is pleased to announce that its pivotal registry on radioembolisation with SIR-Spheres microspheres, the CIRSE Registry for SIR-Spheres Therapy (CIRT) has enrolled its 100th patient!

Just nine months after the launch of the registry in January 2015, CIRT is the largest observational study on the real-life application of SIR-Spheres in Europe, with hospitals enrolled from eight different countries, painting a detailed picture of the clinical use of SIR-Spheres microspheres in Europe.

By aiming to collect a broad spectrum of data points, CIRT will contribute to a better understanding of this therapy. To realise this, CIRT includes the following objectives:

- To produce robust data on the safety, technical success and clinical outcome of SIR-Spheres in the treatment of patients with liver tumours

- To enable outcome data to be collected on patients with less common primary or metastatic liver tumours treated with SIR-Spheres

The data will be collected prospectively from medical centres that have predefined expertise, therefore limiting the amount of selection bias and ensuring high quality data. Furthermore, in order to appreciate the diversity in the treatment of inoperable liver tumours with SIRT, the registry will have a core data set that will be the same for all participating medical centres, while having secondary data points that will respect regional differences. Essential in this respect is the plan to follow up with patients, therefore ensuring that we do not only collect data on the initial treatment, but also on the long-term effects of SIRT.

Should you want to learn more about conducting observational research in partnership with CIRSE, please do not hesitate to get in touch with:

CIRSE Research & Analytics

research@cirse.org

CIRSE Central Office | Cardiovascular and Interventional Radiological Society of Europe



José Ignacio Bilbao
CIRT Principal Investigator



Philippe Pereira
CIREL Principal Investigator



Julien Taieb
CIREL Principal Investigator

Film Interpretation Quiz

This light-hearted and interactive session has always been a CIRSE favourite! All delegates are invited to take part in this last-man-standing battle for supremacy – will you be crowned this year's winner?

Pick up a complimentary CIRSE cap at the door and use this to cast your vote in the multiple choice questions. The Quizmaster will present the audience with two possible answers to each case – those choosing incorrectly are out of the game! The last few contestants left standing will be invited onstage for an exciting head-to-head finale!

Can you beat our Quizmasters? And more importantly – can you beat your friends and colleagues? Put your skills to the test and find out how good you really are!

Join us today at 15:15 in Auditorium 1!

Quizmasters:
Otto van Delden (Amsterdam/NL)
Anthony Watkinson (Exeter/UK)





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Cardiovascular and Interventional Radiological Society of Europe

Pushing Interventional Oncology

The Oncology Alliance Subcommittee, headed by Prof. Andreas Adam, is working to bolster interventional oncology by developing measures that support the provision of high-quality services.

IO Curriculum

Providing first-rate IO services requires both excellent interventional skills and a solid grounding in the fundamentals of oncology. Reflecting this realisation, the Executive Board recently approved the creation of an IO curriculum, which aims to ensure that interventional radiologists engaged in cancer care understand the main principles of surgical, medical and radiation oncology.

The curriculum will constitute a sub-section of CIRSE's European Curriculum and Syllabus of Interventional Radiology, and will focus on select procedures, such as tumour ablation and radioembolisation. It will address relevant terminology, the histopathology and natural history of certain malignant tumours, physics and engineering principles of the procedures, as well as the main principles of radiotherapy, chemotherapy, hormonal therapy and surgery. The development of the curriculum will require input from medical, surgical and radiation oncologists, and CIRSE is seeking advice from European oncological organisations on how best to collect the relevant information.

CIRSE plans to offer courses in IO tailored to the curriculum, and to develop a certification programme in IO for EBIR holders. Detailed preparations will begin after a review by the Board in September.

Quality Assurance in IO

Quality Assurance – the complete set of systematic components required to achieve a treatment result that meets a certain standard – is an essential element of modern medical care, particularly in procedure-oriented disciplines. Radiation oncologists and surgical oncologists already operate within systems that ensure patient safety and encourage good practice, but such guidance is lacking for interventional oncologists. A new initiative seeks to change that reality.

Fortunately, one of the members of the OAS, Dr. Liz Kenny, who is an eminent radiation oncologist in Australia, was intimately involved in developing a QA system for her own discipline in her country. Dr. Kenny has generously made this available to the OAS, which is using it as a template to develop a similar framework for IO, under Dr. Kenny's guidance.

Dr. Keith Ison, Head of Medical Physics at St. Thomas' Hospital in London, will lend his substantial expertise in QA to the OAS. Dr. Ison has already run several internal workshops

on QA in his hospital, assisted by Dr. Shahzad Ilyas, a consultant in interventional radiology with expertise in IO. Draft versions of the comprehensive QA system in IO are already being discussed, and the document will be finalised at a workshop in February 2016, which will be held in the CIRSE Offices in Vienna.

This will be the first such framework in the world, and will play an important role in ensuring the safety of patients, as well as increasing the credibility of IO in the field of oncology. The CIRSE QA document is expected to make its debut at ECIO 2016.



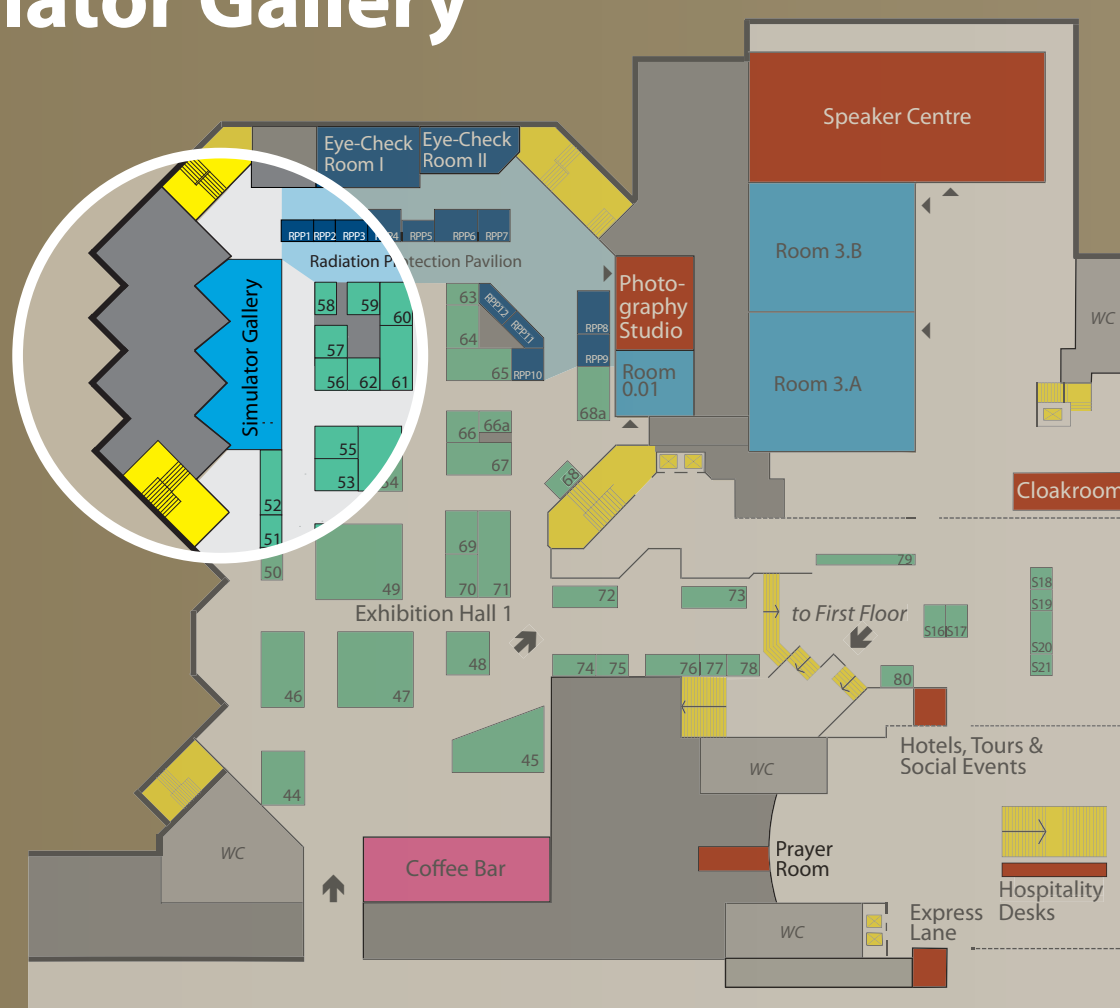
CIRSE's new project on Quality Assurance in IO has already greatly benefited from Dr. Kenny's expertise in QA matters.

Immerse yourself in IR learning – visit the CIRSE 2015 Simulator Gallery

Located next to the Technical Exhibition and Radiation Protection Pavilion, this year's Simulator Gallery will host a number of structured hands-on workshops, as well as open-door sessions where you can try out the simulators in your own time.

For more information about the scheduled events, please visit the CIRSE Info Point on the first floor.

Exhibition Hall 1, Entrance Level



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Cardiovascular and Interventional Radiological Society of Europe

CIRSE 2015

Dinner & Farewell Party

Tuesday, September 29
Opening: 19:30

Tomorrow night we celebrate the close of another successful congress in style!

Tickets can be purchased and collected at the **Hotels, Tours & Social Events** desk, located in Foyer C of the congress centre.

We hope you will be able to join us!

CIRSE supports compliance with ethical standards. Therefore, CIRSE emphasises that the present offer (made by KUONI Congress Destination Management and Buzz Portugal) is directed to participants of CIRSE 2015 and recommends that the participants who want to accept the present offer shall bear any and all costs in this context themselves.

Kindly note that entrance to the CIRSE 2015 Party is NOT included in the CIRSE 2015 registration fee!

CIRSE



Technical issues in thoracoabdominal branched grafting

Eric Verhoeven, Athanasios Katsargyris, Kyriakos Oikonomou and Wolfgang Ritter

Fenestrated and branched endovascular aneurysm repair (FEVAR and BEVAR) have become a preferred technique to treat many juxta- and suprarenal aortic aneurysms, but also thoraco-abdominal aortic aneurysms (TAAA). The extent of the aneurysm correlates with the complexity of the repair, both in planning and execution, and reflects the need for technical requirements.

While FEVAR has become a standardised procedure, BEVAR still requires a much more individualised and elaborate planning and execution, as well as high-end imaging equipment and a wide range of back-up materials. Technical success in thoraco-abdominal branched grafting requires "the full package": correct indication, meticulous stent-graft planning, and technical execution of the procedure. A set-up including a hybrid operating room, a dedicated multidisciplinary team approach, and a large stock of back-up materials are of utmost importance. The specific anatomical issues of each TAAA need to be addressed during planning. In the next paragraphs, we will discuss a number of issues that need attention before the procedure, and potential risks that need addressing during the procedure.

Access

Access tactics should be elaborated upon upfront, as it is mandatory to have a stable access to the aorta throughout the procedure; most of the time via two femoral arteries, and via one upper approach. Our preference is still a bilateral femoral cut-down and a stable "upper" access achieved via the left axillary artery. To this end, a 40 cm 12 Fr. flexor sheath is inserted (Fig. 1). Smaller sheaths and catheters can be used through that 12 Fr. sheath. Through-and-through or buddy wires are some options in challenging access, especially in highly angulated vessels. Conduits are sometimes needed, both on the femoral artery and on an iliac artery. Our technique involves the use of a 10 mm dacron tube graft, which is sutured end-to-side onto the native artery. Distally, we do clamp the dacron graft and puncture the graft more proximally to keep a tied seal when introducing and removing the introducers or larger sheaths (Fig. 2).

Landing zone

A secure proximal landing zone is essential for durable aneurysm exclusion. In cases where a TAAA extends proximally, sealing in the aortic arch is frequently required. Surgical arch debranching or the use of a proximal fenestrated stent-graft for the arch (left carotid and left subclavian artery) followed by a branched component for the TAAA offers a solution. It is important to achieve a stable and durable proximal landing zone, as any migration of the stent-graft would not only result in an endoleak but also jeopardise the patency of branches or fenestrations!

Both proximally and distally, important branches that provide collaterals to the spinal cord should be preserved. In case there is no suitable landing zone distally from the left subclavian artery, a debranching technique should be used. Distally, one can usually land onto the abdominal aorta or in the common iliac arteries. If one is facing an aneurysm with extent to the common iliac arteries, it is important to preserve hypogastric artery flow by using iliac bifurcation devices (IBD), to reduce the risk of paraplegia. Additionally, early restoration of blood flow to the hypogastric arteries and to the limbs is important. In our opinion,

many centres do not pay enough attention to this! Prolonged ischaemia of both hypogastric arteries and the limbs will result not only in longer ischaemia of the spinal cord, but also in ischaemia-reperfusion injury that can lead to haemodynamic instability of the patient, and even delayed spinal cord ischaemia with paraplegia. In our centre, the use of prolene 4/0 purse string sutures and snuggers is standard technique, and larger sheaths are withdrawn below the level of the iliac bifurcation and removed completely whenever possible (Fig. 3). The purse string sutures are snugged, to provide a tied seal but still allow flow through the limb (Fig. 4).

Anatomy

Difficult anatomy of target vessels (take-off angle, kinking, stenosis) may result in catheterisation problems. The use of alternative catheters and wires (0.018" & 0.014") is sometimes necessary. Whenever a target vessel is successfully catheterised, it is wise to confirm this by angiography. Take into account that the wire may disappear in a small branch or be in the wrong vessel (e.g. accessory renal artery, lumbar artery). Angiography will also guide you to position your stiff wire in the main branch, and to decide upon the diameter and length of the bridging stent-graft. In the rare scenario of failure with antegrade target vessel catheterisation, a retrograde approach via lumbotomy or laparotomy can be used as a bail-out to salvage the target vessel. The target vessel can then be punctured and a wire



Figure 1: stable upper access via the left axillary artery with a Flexor sheath ANL1 12 Fr. (Cook Inc, Bloomington, IN, USA).



Figure 2: surgical conduit with a 10 mm dacron graft. The graft is clamped distally and punctured to achieve a better seal.

advanced retrogradely, to be snared through the fenestration/branch.

Both fenestrations and branches need to be fitted with covered stents, to exclude the aneurysm. Fenestrations are always fitted with balloon-expandable covered stents as they need to be flaired with a larger balloon, in order to achieve some fixation on the reinforced fenestration. Care should be exercised to keep the stent in the correct position, with about 2 cm of sealing into the target vessel, and 3-4 mm inside the main graft, to allow for adequate flairing.

For branches, both balloon-expandable and self-expandable stents are an option, but if the angle to be addressed is too big, relining with a self-expandable non-covered stent is an option. The purpose of this relining can be two-fold: first add to the kink-resistance in an angulated path, second to smoothen the transition zone between the stiffer covered stent and the target vessel. Sometimes, if the chosen covered stent has to be fairly short (e.g. in the presence of an early bifurcation), a non-covered stent over that bifurcation helps stabilising the covered stent without losing the branch of the target vessel.

Deployment

Deployment of the bifurcated component seems the easiest part at the end of the procedure, but mistakes are possible! Check adequate overlap with the branched tube graft, correct position below the lowest renal artery fenestration/branch, and correct orientation and level of the contralateral gate. As always, confirm that the gate is catheterised correctly. It would not be the first time that a contralateral limb is being positioned outside the gate, between the tube graft and the bifurcated graft. It happened once in our centre! The situation was saved by extending the wrongly positioned contralateral limb to the top of the bifurcated graft, and by using two balloon-expandable stents. These crushed the original gate and created a chimney for the contralateral limb.

In our experience, planning of the graft and organising the logistical needs play a major role in TAAA branched grafting. Avoiding mistakes during the procedure is the best guarantee for success. To achieve success, every procedural step should be double-checked. Anatomical difficulties sometimes require inventive solutions or at least additional materials of all kinds. Mistakes usually result in painful longer exercises to correct the situation, if at all possible!

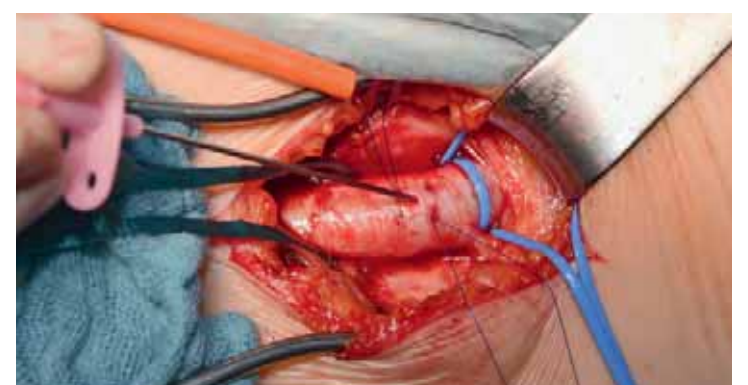


Figure 3: double purse string sutures with prolene 4/0 before puncture.

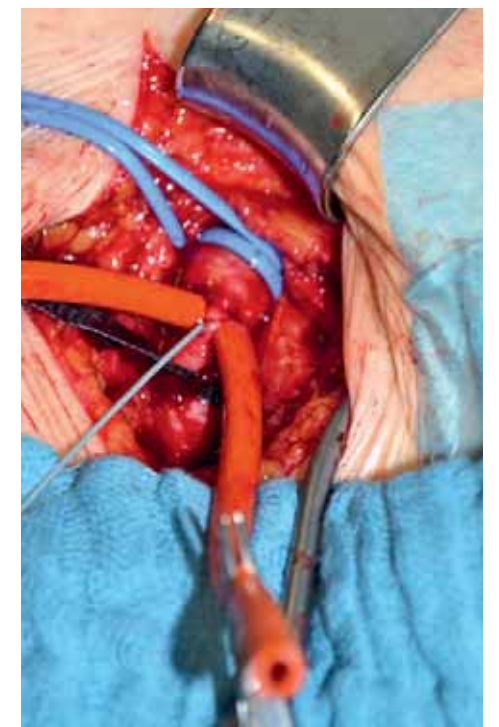


Figure 4: removal of introduction systems while maintaining access with a stiff wire, and snug-ging of the purse string sutures, in order to restore perfusion to the limb.

Don't miss it!

Complex thoracic aorta Lecture Session

Monday, September 28, 08:30-09:30
Auditorium 2



Eric L. Verhoeven
Paracelsus Medical University,
Nuremberg, Germany

Prof. Verhoeven is a vascular surgeon from Belgium, known for his expertise in aortic repair. He has long been an advocate for a multidisciplinary approach to interventions, research and education in the this field, and serves on the Scientific Programme Committee of the first ever IDEAS symposium. He is a well-known face at CIRSE meetings, having attended as a faculty member for the last 7 years.

This article was written in collaboration with colleagues from the departments of both vascular and endovascular surgery (Athanasios Katsargyris and Kyriakos Oikonomou), and interventional radiology (Wolfgang Ritter).

Suggested Reading:

1. Verhoeven EL, et al. Ten-year Experience with Endovascular Repair of Thoracoabdominal Aortic Aneurysms: Results from 166 Consecutive Patients. *Eur J Vasc Endovasc Surg*, 2015
2. Guillou M, et al. Endovascular treatment of thoracoabdominal aortic aneurysms. *J Vasc Surg*, 2012. 56(1): p. 65-73
3. Roselli EE, et al. Endovascular treatment of thoracoabdominal aortic aneurysms. *J Thorac Cardiovasc Surg*, 2007. 133(6): p. 1474-82
4. Verhoeven EL, et al. Practical points of attention beyond instructions for use with the Zenith fenestrated stent graft. *J Vasc Surg*, 2014. 60(1): p. 246-52



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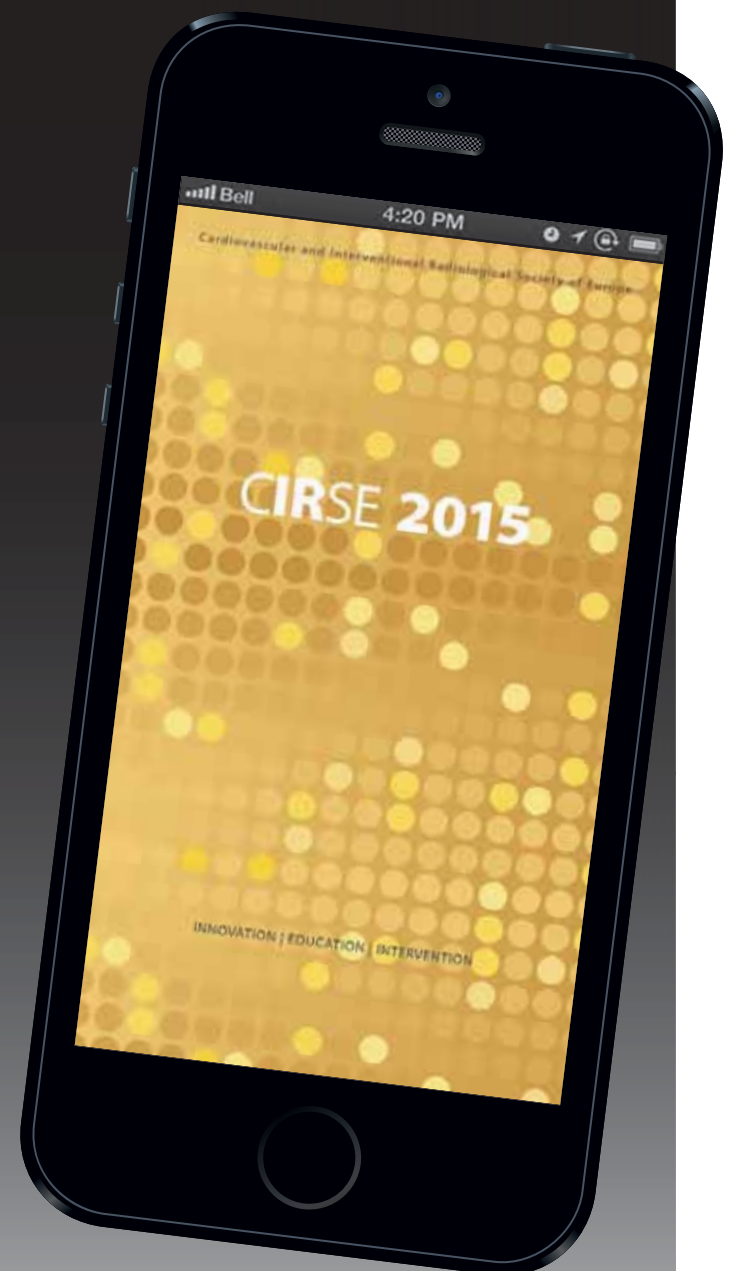
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Tips and tricks for FEVAR

Richard McWilliams (EBIR) and Andrew England

Fenestrated EVAR has been in reasonably common use for more than ten years, and there are new centres starting programmes regularly. The first fenestrated EVAR at the Royal Liverpool University Hospital was performed in 2003. Here, we will share some tips and tricks, based on our experience. These and other cases will be discussed during the IDEAS symposium.

Preparation

Understand the anatomy of the target vessels before the case. Fluoroscopy time and contrast medium should not be wasted during the case trying to understand the anatomy which was (or should have been) clearly demonstrated on the pre-FEVAR CT scan. FEVAR should ideally be performed in a hybrid theatre with the facility to perform 3D road-mapping, using the pre-op CT dataset, and this has been shown to reduce procedure times and radiation doses.

Imaging

High-quality fluoroscopy is needed for FEVAR. Fluoroscopy of lesser quality may seem adequate with simple AP screening, but may struggle to provide adequate images during lateral screening to position and catheterise fenestrations for the coeliac axis and SMA (Fig. 1). Optimal imaging is also needed when procedures become difficult (Fig. 2).

Tools

The target vessel stent diameter, length and delivery system length should be noted for each vessel in planning. Failure to make all the required consumables available can add much time to the procedure and may compromise its success.

The stent diameter is chosen with reference to the size of the fenestration and the size of the ostium and landing zone of the target vessel.

The stent length is influenced by the expected distance between the fenestration and the target vessel, the distance to important branch vessels and sites of angulation of the target vessel (Fig. 3).

Deployment

The proximal fenestrated component generally occupies most of the operator's thoughts during planning and deployment. The operator must however continue to concentrate on the distal component, which is often seen as of secondary importance. Lazy deployment of the distal component risks inadequate engagement of the iliac arteries or miscannulation of the contralateral limb. Cannulation of the contralateral limb is a potential pitfall if the operator mistakenly bypasses the gate but engages the bottom end of the proximal component. This can be avoided by confirming cannulation with the use of a moulding balloon (Fig. 4).

Avoid excessive manipulation of the proximal component when there is significant atheroma/thrombus in the seal zone. Double diameter-reducing ties in such cases can minimise contact between the proximal graft and the aortic wall until these are removed after successful positioning and vessel cannulation. Double diameter-reducing ties are also useful when performing proximal fenestrated cuffs in existing endografts. Rotational control in such anatomy can be limited with single ties when the two endografts interact (Fig. 5).

If the graft is planned and deployed well then target vessel cannulation is often easy. If there is difficulty cannulating a vessel, check that the height and rotational alignment are maintained rather than wasting time with futile attempts to achieve the impossible. The fenestration is ideally positioned with the bottom of the fenestration pushed up to the bottom of the target vessel. We know that minor caudal

migration of fenestrated grafts is documented in surveillance and this acts as a means of future-proofing the target vessels (Fig. 6).

Achieving stable access to the target vessels is a well-understood process. The difficulty of this depends on the three-dimensional angulation of the target vessel. There is a hierarchical approach to building up the strength of the platform in the visceral circulation. This often requires an incremental increase in the strength of the wire and catheter system which ultimately allows access for a wire which is sufficiently strong to allow a braided sheath to be tracked into the target vessel. The tapered tip of the Navicross Support Catheter (Terumo Interventional Systems) has, in our hands, proven itself to be the best product for difficult cannulations (Fig. 7). In our experience the downward-pointing right renal artery, which also usually angles backwards as it passes behind the IVC, is the most difficult vessel to cannulate. It is possible that some of these difficult challenges will be made simpler with steerable sheaths.

Potential pitfalls

The right renal artery and SMA are often close neighbours and it is possible to cannulate the SMA via the right renal fenestration or vice versa (Fig. 8). This potential pitfall needs to be remembered.

These can be long cases and this has implications for blood loss, heparinisation and lower limb blood flow. Blood loss through the groin access and sheaths needs to be minimised. We monitor the ACT during the procedure.

Lower limb perfusion may be significantly compromised during long procedures and strategies to reduce this need to be adopted.

Small proximal endoleaks may be seen on the completion angiogram, particularly with

Don't miss it!

Complex abdominal aorta
Lecture Session

Monday, September 28, 10:00-11:00
Auditorium 2



Richard McWilliams
(EBIR)
Royal Liverpool
University Hospital
Liverpool, UK

Prof. Richard McWilliams is a consultant vascular radiologist at Royal Liverpool Hospitals. In addition to being a CIRSE Fellow, he is a Fellow of the Royal College of Radiologists, and a member and former council member of the British Society of Interventional Radiology, and a former council member of the British Society of Endovascular Therapy.

His co-author, Andrew England works at the University of Salford. He has been Senior Lecturer within the Directorate of Radiography since January 2013. Prior to this, he was a lecturer at the University of Liverpool for six years. Alongside his teaching and research work, he is still a practising clinical radiographer and undertakes bank duties at a local NHS Hospital.

high-quality fluoroscopy. Fortunately, endoleak at one month CT is very rare with fenestrated grafts.

Secondary interventions are rare, but have particular challenges because of the multiple visceral artery stents which protrude into the aortic lumen. We have occasionally needed to redilate visceral artery stents because of para-ostial endoleaks (Fig. 9). It is probable that the initial seal of these stents is disturbed at some point later in the procedure. The most likely times are during dilatation and flaring of adjacent target vessel stents or during insertion of the distal components of the endograft.



Figure 1: (a) AP view of the fenestrated graft before release. Lateral fluoroscopy is required for more complex grafts which have fenestrations for the coeliac axis and SMA (b).

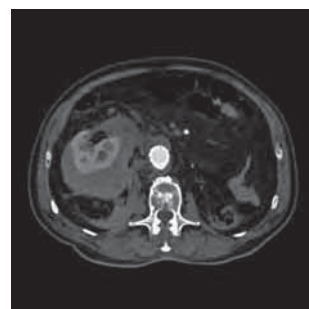


Figure 2: (a) right perinephric haematoma after FEVAR due to capsular perforation by the guidewire. (b) Extravasation from a lower pole left renal branch (black arrow) which requires embolisation.



Figure 3: the SMA stent length is chosen and the stent positioned (white arrow) based on the location of the first branch.

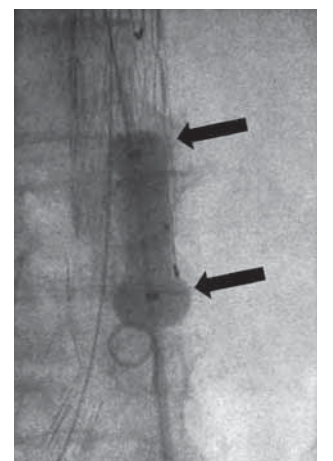


Figure 4: correct cannulation of the contralateral limb confirmed by the use of the moulding balloon which dilates further above and below it (black arrows).



Figure 5: double diameter-reducing ties allow repositioning of the fenestrated cuff when used to extend the seal-zone of an existing endograft.



Figure 6: the bottom of the fenestration is pushed up to the bottom of the left renal artery (black arrow).



Figure 7: Navicross catheter (black arrows) tracking into the left renal artery via the cul de sac at the top of the proximal fenestrated component.



Figure 8: stored fluoroscopic image. SMA has been cannulated first (white arrow); wire through the right renal fenestration has also passed initially into the SMA because of the close relationship of the two vessel ostia. This must be recognised before the stents are placed.



Figure 9: (a) endoleak demonstrated with a catheter placed adjacent to the left renal fenestration (black arrow). The endoleak was abolished after redilatation of the stent (b).

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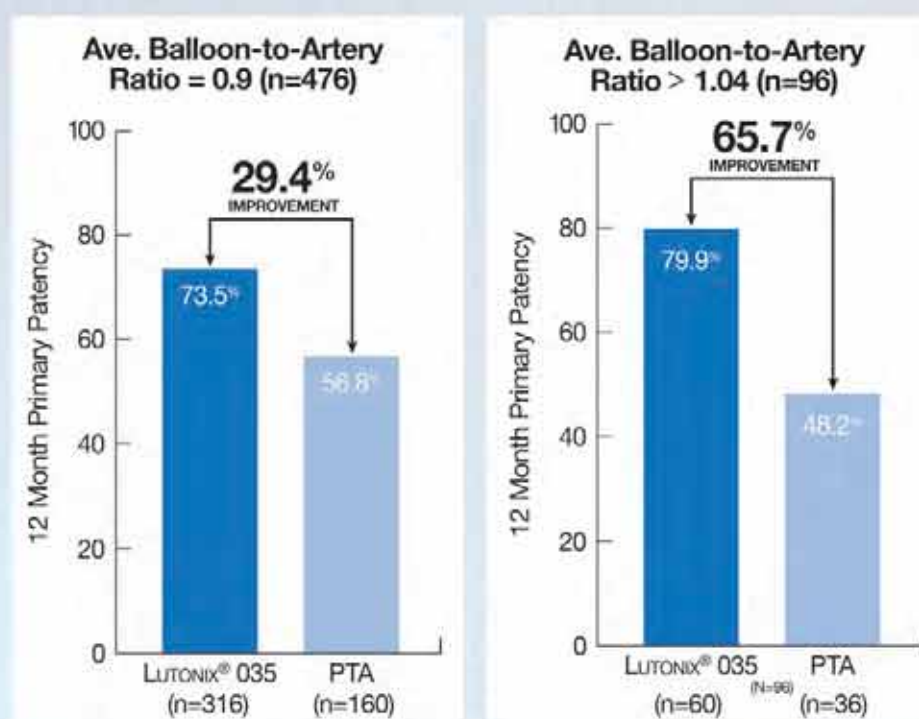


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¹ LEVANT 2 roll-ins, LEVANT 2 randomized trials and LEVANT 2 Continued Access Registry.

² A post-hoc subgroup analysis suggests the full wall apposition of the Lutonix[®] 035 Drug Coated Balloon (minimum 1.04:1 balloon-to-artery ratio of the treatment device) showed increased primary patency to 79.9%. Primary patency defined as absence of binary restenosis defined by DUS PSVR \geq 2.5 and freedom from Target Lesion Revascularization (TLR). At 12 months, treatment with Lutonix[®] 035 resulted in a freedom from primary safety event rate of 85.8% (balloon-to-artery ratio <1) and 79.3% (balloon-to-artery ratio >1). Primary safety defined as composite of freedom from all-cause peri-operative death and freedom at 1 year in the index limb from Amputation (ATK or BTK), Reintervention, and Index-limb related death. Numbers reported are Kaplan-Meier analyses, not prespecified. **Warning: Do not exceed Rated Burst Pressure.**

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CIRSE 2015 Student Programme – Be inspIRed!

Day 3: We hope you're enjoying the congress so far!

Today offers another chance to learn more about the specialty. Some more recommended sessions are listed to the right.

Student Evening

All students are warmly invited to attend the student mixer tonight. Join us for a good time at "O Bom, O Mau, E O Vilão" from 20:00 until midnight. All welcome packs contained a voucher for a welcome drink – don't forget to bring it with you! We're looking forward to seeing you there!

The Students' Lounge...

is open to all students and is located next to the Members' Lounge. Whether you want to meet other students, write up your notes, or simply sit back and relax, the Student Lounge is the place to be. Lunch is available for each student in the Lounge from 12:00-14:00, Saturday to Tuesday.

Vegetarian meals will also be available.

Today's picks:

08:30-09:30

FC 1701 Fundamental Course

Basic principles of transcatheter embolisation in the trauma patient

Treatment of extremity trauma

S.J. McPherson (Leeds/UK)

Treatment of parenchymatous bleeding in abdominal cavity

J. Urbano (Madrid/ES)

Treatment of pelvic haemorrhage

W. Jaschke (Innsbruck/AT)

Role of stent grafts in large vessel trauma

F. Wolf (Vienna/AT)

14:30-15:15

XS 2101 The X-Session

Speakers: A. Adam (London/UK), J. Lammer (Vienna/AT), M.J. Lee (Dublin/IE), J.H. Peregrin (Prague/CZ), J.A. Reekers (Amsterdam/NL), D. Vorwerk (Ingolstadt/DE)

15:15-16:00

FI 2102 Film Interpretation Quiz

Co-ordinators: O.M. van Delden (Amsterdam/NL), A.F. Watkinson (Exeter/UK)

16:15-17:15

WS 2204 Workshop

Lung and kidney ablation: case-based discussion

R.F. Grasso (Rome/IT)

C.S. Georgiades (Nicosia/CY)



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This unique congress allows participants to openly discuss cases that did not go as planned, and gives young doctors the opportunity to interact directly with colleagues who experienced such situations. The event attracts physicians who are strongly committed to keep perfecting their work. As a result, discussions are exceptionally frank, engaging and informative.

Unique Format

The event's discreet and professional environment is vital. The faculty is carefully selected and overall participation is limited. Hand-picked case reports constitute another essential element. This unusual approach has been tremendously popular, and ICCIR has quickly established itself as the main complications meeting in Europe. Don't miss your chance to take part in this exceptional event – mark your calendars now!

For more information, please visit: www.iccir.eu

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Symposium

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Chairman: Pr J. Bruix (Barcelona, Spain)

"HCC treatment algorithm: Selected topics"

AUDITORIUM 8

¹ Data on file. Ref LPMCV-004. ² Data on file. Comparison with Terumo's previously commercialized product. Ref LPMCV-004.
³ Data on file. Ref LPBTG-002, LPMCV-003, LPMCV-004.