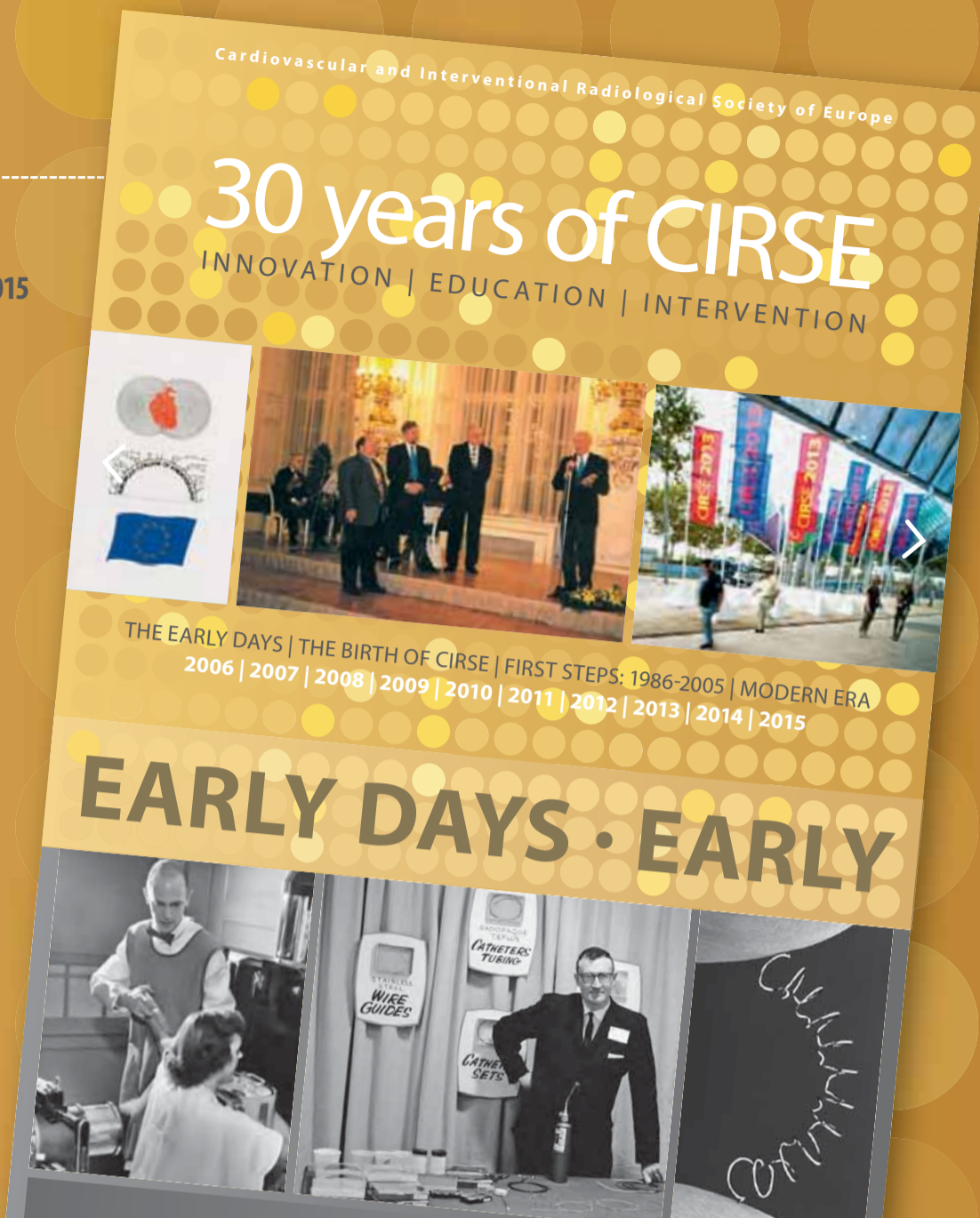


**CIRSE 2015 – Lisbon**  
**Saturday, September 26, 2015**



**Anna-Maria Belli**  
CIRSE President



**Patrick Haage**  
Scientific Programme  
Committee Chairperson



**Christoph A. Binkert**  
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Committee Deputy  
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**Fabrizio Fanelli**  
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**Élia Coimbra**  
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**Belarmino Gonçalves**  
CIRSE 2015 Local  
Host Committee  
SPC Representative

#### Dear colleagues,

Once again, we find ourselves returning to Lisbon to celebrate the biggest IR event of the year. This year, however, we have more than one event to celebrate: not only is CIRSE launching the first Interdisciplinary Endovascular Aortic Symposia (IDEAS) tomorrow, but it is also celebrating its 30th birthday!

The subspecialty has come a long way in this time, and the congress will be showcasing various events and services to reflect this. Today's Opening and Awards Ceremony will see the Gold Medal awarded to Josef Rösch, one of IR's most exceptional pioneers (see page 2).

A one-off "X-Session" on Monday will feature the personal reminiscences of six CIRSE past-presidents, who will recall important formative moments from their clinical careers, and reflect on how the field of IR has grown and progressed since their early involvement.

And in addition to our Members' Lounge, we have a special 30 Years of CIRSE Lounge, where visitors can pick up memorabilia or browse a brand-new, specially created webpage that charts the history of the society. You never know whose photo you might stumble across!

#### Broad scientific programme

Once again, the congress is structured around six clinical tracks, allowing delegates to easily find the sessions that are most relevant to their own daily practice and research.

Interdisciplinary collaboration is an essential part of modern medical practice, and we are committed to welcoming practitioners from other specialties to our Annual Meetings. The newly formed Multidisciplinary Expert Board sessions, which draw on the collaborative

tradition of tumour boards, feature stimulating interdisciplinary exchanges on commonly encountered challenges in the oncological and vascular fields.

Good practice can only be achieved – and maintained – by ongoing debate and critical evaluation. To this end, Hot Topic Symposia on both paediatric and aortic interventions are planned, as are a number of *Controversies* sessions addressing radiation safety, arterial intervention and venous disease. To ensure that best practice is determined by clinical data, the popular Evidence Fora will examine the use of peripheral angioplasty and drug-eluting devices.

Other programme highlights for CIRSE 2015 include four Venous Forums, tackling diverse aspects of venous interventions. The high turnout for 2014's session on DVT and PE suggests these will be particularly attractive to our delegates.

We also encourage you to attend our more community-oriented sessions, such as the Opening and Awards Ceremony, the Film Interpretation Quiz, Amazing Interventions, CIRSE meets China, and the one-off X-Session.

Of course, special thanks are owed to our industry partners, who participate not only in our Technical Exhibition, but also organise Satellite Symposia and Learning Centres, and support us in our aim to provide a unique forum for innovation, education and research in IR.

#### Focus on aortic interventions

The widespread adoption of, and new technological developments in, EVAR and TEVAR inspired the introduction of a feature that is making its debut at CIRSE 2015: the Interdisciplinary Endovascular Aortic Symposium

(IDEAS). This stand-alone programme features 14 hours of targeted education, and will run right here in the Centro de Congressos de Lisboa from Sunday morning until midday on Tuesday. Delegates who have registered for either event will be able to attend these specialised sessions and the CIRSE 2015 technical exhibition.

#### Going green

In keeping with IR's tradition of dynamism, and the digital age we find ourselves in, CIRSE has decided to become a greener meeting. The Main Programme has been replaced by a lighter abstract book, with more detailed information about the programme, faculty and congress centre still available in the handy Pocket Guide, as well as via the CIRSE app's Itinerary Planner. This will reduce not only our environmental footprint, but also the weight of your congress bags!

#### Helping hands

The CIRSE app features many useful tools to help with your congress planning, including an exportable itinerary, abstracts and interactive floor plans. It allows you to evaluate sessions, search the technical exhibition by product category, take part in e-voting sessions and submit questions to the moderator in selected sessions.

It is available for iPhone, iPad and Android ([www.cirse.org/app](http://www.cirse.org/app)) – those who already have it installed on their device should add the CIRSE/IDEAS 2015 event.

If you've any questions about the app, the pocket guide or the congress itself, please call to the dedicated Info Point between Auditoria 1 and 2, where our friendly staff would be pleased to help.

We hope you'll enjoy your stay in Lisbon!

## Opening and Awards Ceremony – 14:30, Auditorium 1

**Welcome to CIRSE 2015: four and a half days of first-rate lectures, workshops and debates on the ever-evolving IR subspecialty. With prominent researchers and clinicians coming together from all over the globe to present the very best the field has to offer, there is much to celebrate!**

Please join us for the Opening and Awards Ceremony, which starts today at 14:30 in Auditorium 1. The event provides an ideal opportunity to highlight the achievements of select physicians and researchers who have made exceptional contributions to interventional radiology.

The ceremony will again feature live musical entertainment. This year, this will be provided by Petr Spatina, an artist who has developed an intriguing technique involving a truly unique instrument – the Glass Harp – consisting of 33 wine glasses, filled and tuned with water.

Spatina was born in the Czech Republic as a farmer's son, and initially studied the accordion

and piano. He discovered the Glass Harp over twenty years ago, and has been playing it ever since.

He covers a broad range of classics with his instrument, covering pieces by Franz Liszt as well as by Leonard Cohen. The sound needs to be witnessed to be believed – and even then it remains difficult to comprehend how a collection of wine glasses can produce such an impressively wide range of subtle sounds.

Spatina has performed all over the world, including in Berlin, London, Moscow and Sydney, and has made several TV appearances.

His music was featured in a well-known car advert in 2010. The film industry has also shown interest in his unique skill, and he has already been involved in producing music for two European feature films.

Be sure to join us for what will surely be a memorable event!

## CVIR Editor's Medal Award



This year's Editor's Medal will be presented to a research group from Turkey, for their investigations into acute iliofemoral venous thrombosis.

**Use of Percutaneous Aspiration Thrombectomy vs. Anticoagulation Therapy to Treat Acute Iliofemoral Venous Thrombosis: 1-Year Follow-up Results of a Randomised, Clinical Trial**

V. Cakir, A. Gulcu, E. Akay, A. E. Capar, T. Gencpinar, B. Kucuk, O. Karabay, A. Y. Goktay. CVIR 2014 (Aug); vol. 37(iss. 4):969-76

## Award of Excellence and Innovation in IR

The Award of Excellence and Innovation in IR is sponsored by the R.W. Günther Foundation, and seeks to reward and encourage exceptional research in the field of interventional radiology. The award is presented during the Opening and Awards Ceremony of the CIRSE Annual Meeting, bestowing recognition and a €5,000 prize to the best applicant.

This year, the award will go to the Leman Research Group from Lausanne, Switzerland, for their research on drug-eluting beads loaded with anti-angiogenic agents for chemoembolisation.

### The innovation

Transarterial chemoembolisation uses microspheres to both embolise the hepatic artery and block the tumour's blood supply, and to serve as targeted anti-cancer or anti-angiogenic drug-carriers. Drug-eluting beads have become an accepted part of this procedure. However, challenges remain. The suitability of the main drug used for this therapy – Doxorubicin – has been questioned. In addition, the ischaemia induced by the embolisation also contributes to the development of new vessel sprouts near the tumour.

The Leman Research Group has paved the way for overcoming these hurdles by exploring the possibility of combining embolic beads with a multi-targeted tyrosine kinase inhibitor

that inhibits tumour vessel growth instead of relying on standard doxorubicin-eluting beads.

The group's investigations have scrutinised different elements of this option, focusing on sunitinib malate, which has been identified as a potent inhibitor. In one study, the group demonstrated that sunitinib could be adequately carried by a widely used, commercially available type of embolic microsphere. The researchers have also compared different *in vitro* methods to measure the drug released from sunitinib-eluting beads, focusing on the influence of varying hydrodynamic conditions.

In addition, the group has successfully tackled the challenge of loading drug-eluting beads with anti-angiogenic agents of low aqueous solubility, such as sunitinib, developing a novel method for doing so. The new loading method has been patented in Europe.

### The winning team

The research was produced by the Leman Research Group, which consists of Prof. Alban Denys, Dr. Pierre Bize, Prof. Gerrit Borchard, Katrin Fuchs and Dr. Olivier Jordan.

Prof. Alban Denys heads the Digestive and Oncologic Imaging and Interventional Radiology Unit at the University Hospital of Lausanne (CHUV), where he is also a full professor. Prof. Denys serves as reviewer for multiple journals, and is on the editorial board of

## Gold Medallist

### Josef Rösch

Laudation: Jan Peregrin



Josef Rösch was born in Pilsen, Czechoslovakia (today the Czech Republic) in 1925. He earned his medical degree at Charles University in Prague in 1950, before completing his radiologic training at the Central Military Hospital in Prague. Dr. Rösch began his angiographic career with transperietal splenoportography in 1954, later adding visceral angiography. While in Prague, he wrote two monographs: *Transperietal Splenoportography* and *Radiology of Spleen and Pancreas*. The latter became a prime teaching book, and was translated into four languages. He became Doctor of Medical Sciences at Charles University in Prague in 1965, and Docent in 1966.

In 1967, Dr. Rösch moved to the USA following an invitation from Dr. Charles Dotter. Aside from a two-year visiting professorship at UCLA, he has worked at OHSU ever since. At OHSU, he served as Chief of Cardiovascular Radiology and, in the late 1980s, was instrumental in establishing the Dotter Interventional Institute, of which he was the Founding Director until 1993. Prof. Rösch retired from clinical practice in 1995, and has since focused on research and education.

His research has covered diverse aspects of IR, from super-selective catheterisation tech-

niques, visceral angiography and transjugular liver procedures to coronary angiography, fallopian tube recanalisation and expandable stents. An innovator in his field, Dr. Rösch developed the TIPS technique in 1969, and introduced embolisation of gastrointestinal haemorrhage in 1972. In the 1980s, his research focused on the use of endoluminal prostheses, including their use in TIPS. His work helped introduce TIPS to clinical practice.

A prolific writer, Prof. Rösch has authored or co-authored 493 scientific papers and book chapters, two books, and 23 scientific exhibits; contributed to 17 teaching films/videos and CDs; and served as co-editor of two books. He is a fellow of both CIRSE and SIR, an honorary fellow of the ACR, a member of the RSNA and the American Heart Association, and an honorary member of many radiological societies worldwide.

His work has been recognised with many awards and honours, not least an OHSU research professorship, the Josef Rösch Chair of Interventional Radiology Research, and eponymous honorary lectures by both CIRSE and the Society of Interventional Radiology of the Czech Republic.

*European Radiology: Vascular and Interventional* and *CVIR*. Prof. Denys has published over 170 papers in peer-reviewed journals.

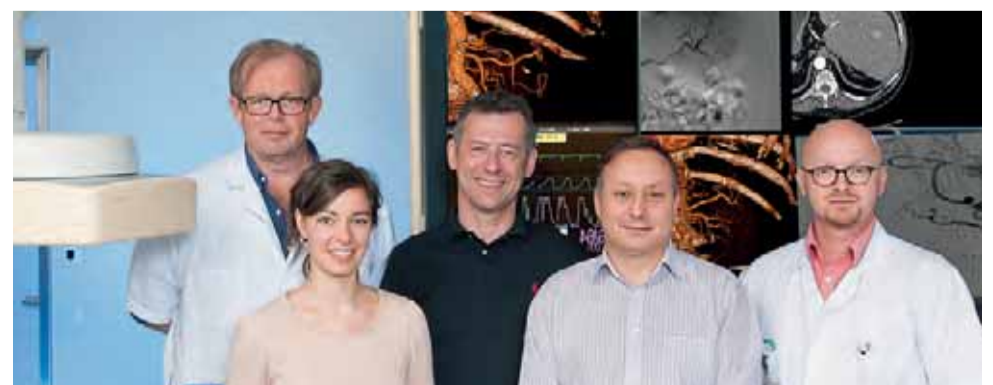
Dr. Pierre Bize is a senior physician in the Department of Medical Imaging at CHUV. He trained in general surgery, cardiac surgery and neurosurgery before focusing on radiology and interventional radiology. He specialises in tumour ablation and embolisation techniques, including chemoembolisation, and has particular expertise in the management of VX2 animal model trials.

Prof. Gerrit Borchard is full professor in biopharmaceutical sciences at the University of Geneva. In 2013, Prof. Borchard was elected Vice President of the Executive Committee of the European Federation of Pharmaceutical

Sciences. He is named as inventor on seven patents.

Katrin Fuchs is a Ph.D. candidate at the University of Geneva, focusing her thesis on anti-angiogenic strategies for transarterial chemoembolisation. She completed her pharmacy studies at the University of Regensburg, in Germany, in 2010, and is a licensed pharmacist since 2011.

Dr. Olivier Jordan, a senior lecturer at the University of Geneva, holds a Ph.D. in physics. He works at the university's Laboratory of Pharmaceutics and Biopharmaceutics, carrying out research projects on injectable biomaterials, and teaching on biomaterials and technology transfers. His areas of expertise include drug delivery via loco-regional approaches.



(from left to right) A. Denys, K. Fuchs, G. Borchard, O. Jordan, P. Bize

## Distinguished Fellow

### Riccardo Lencioni

Laudation: Andy Adam



Riccardo Lencioni is one of the world's foremost interventional oncology specialists, and is particularly well-known for his influential work on liver cancer.

In 1994, while still a radiology resident, Prof. Lencioni published the first European study on the combined use of chemoembolisation and ethanol injection for the treatment of hepatocellular carcinoma (HCC), in *CVIR*. This was followed one year later by his seminal work on prognostic factors for HCC patients treated with local ablation. The criteria for identifying long-term survivors, published in his 1995 paper in *Cancer*, were confirmed as the best outcome predictors for liver transplantation, and are currently accepted worldwide for defining early-stage HCC.

Prof. Lencioni has always been on the cutting edge of research in interventional oncology. He conducted the first randomised controlled trial on the use of radiofrequency ablation for HCC in 2003, and the first intention-to-treat analysis of long-term survival of treated patients in 2005. The results of these studies led to the recognition of image-guided ablation as the standard of care for non-surgical patients with early-stage HCC in international guidelines.

Riccardo Lencioni also launched the first programme on RFA of lung tumours in Europe. He has been active in investigating the potential synergies between molecular-targeted agents and interventional techniques, and was the principal investigator for the two largest multicentre randomised controlled trials assessing the clinical benefits of innovative regimens – the very first global clinical studies ever conducted in the field of interventional oncology. He is also well-known for being the lead author of the modified RECIST criteria (mRECIST) for the evaluation of tumour response in HCC.

He has received considerable international recognition, including awards for the most-cited publications from the editors-in-chief of *European Radiology* and *CVIR*. Prof. Lencioni is actively involved with numerous scientific societies and organisations, including CIRSE, SIR, EAR, ECR, RSNA, WCIO, ESGAR, ILCA and SIRM.

In addition, Riccardo Lencioni has authored 182 articles in peer-reviewed, international journals indexed in PubMed. According to the SCOPUS database, his publications have been cited in international scientific literature over 13,000 times, amounting to an *h-index* of 53.

## Distinguished Fellow

### Hannu Ilmari Manninen

Laudation: Poul-Erik Andersen



Hannu Manninen completed his M.Sc. degree in medical physics and his M.D. degree at the University of Kuopio in 1980. He finalised his thesis in diagnostic radiology in 1985 and completed his residency in Kuopio University Hospital in 1987. He was appointed head of the 1st Department of Radiology at Kuopio University Hospital in 1989. In 2004, he was both promoted to chairman of the entire radiology clinic, and became Professor of Interventional Radiology at the University of Eastern Finland.

Prof. Manninen is the author or co-author of more than 150 peer-reviewed original publications and he has written 20 reviews or book chapters, mainly focused on cardiovascular imaging and interventional radiology. For more than 25 years, his main areas of scientific interest have been endovascular therapies for peripheral ASO, including pioneering prospective studies of infrapopliteal PTA and gene therapy. He has been the principal investigator in two prospective randomised trials, comparing hysterectomy with endovascular embolisation of uterine leiomyomas and evaluating the placement of drug-eluting stents with bypass surgery for treatment of

femoropopliteal ASO. Recently he has also focused on aortic interventions and novel techniques for treatment of intracranial aneurysms and acute stroke. He has been an editorial board member of *European Radiology*, *Acta Radiologica* and *CVIR*.

Prof. Manninen has served the Radiological Society of Finland as board member, Vice-President and President. He has also been an administrative member of the Finnish Medical Society Duodecim and the Finnish Society of Angiology. He was a member of the Council of Medical Faculty of Kuopio University from 2001-2003 and a president of the Finnish Society of Interventional Radiology from 1997-1998. Prof. Manninen is also EBIR-certified and a CIRSE Fellow. He was the local chairman of the first advanced ESIR course on vascular interventions, held in Kuopio in 2008, and since 1996, has organised ten national meetings in Kuopio University Hospital focusing on vascular imaging and interventions, including lectures and live cases transmitted from angio-suites and operating theatres. He has also held numerous hands-on training sessions using pig models for small groups of young interventional radiologists.

## Distinguished Fellow

### Katerina Malagari

Laudation: Elias Brountzos



Katerina Malagari is an associate professor of radiology in the IR division of the Department of Radiology at the University of Athens, in Greece. Dr. Malagari was board certified in 1990, and obtained her Ph.D. from the University of Athens two years later. She completed a fellowship in Chest at the University of Alabama at Birmingham, and a fellowship in interventional radiology at the University of Athens, before obtaining EBIR certification in 2010.

Her clinical and research interests centre on embolisation, with a special focus on interventional oncology. She is currently part of Prof. Dimitrios Kelekis's research team, working with Dr. Mary Pomoni at Evgenidion Hospital and Attikon University Hospital. She also actively contributes to efforts to develop scientific protocols for research in interventional oncology, and is part of the National Referral Centre for Liver Diseases and Hepatocellular Carcinoma of Greece.

An editorial board member of *CVIR*, Dr. Malagari is also an active reviewer for various other scientific journals, including *Hepatology*, *Hepatogastroenterology*, *European Radiology*, *Chest* and *European Respiratory Journal*. She has also contributed to sixteen books, distributed both in Greece and inter-

nationally, and has published 107 articles in peer-reviewed journals.

Her publications focus on chemoembolisation of HCC, with recent articles assessing the response of HCC to transarterial chemoembolisation with mRECIST criteria and contrast-enhanced US, the safety and efficacy of chemoembolisation of HCC, and chemoembolisation with doxorubicin-eluting beads for unresectable HCC.

Dr. Malagari is an active member of various multidisciplinary committees and of several international societies, including CIRSE, SIR, the American Roentgen Ray Society, and the European Society of Thoracic Imaging, serving as President of the latter's Annual Meeting in 2007. She contributed to CIRSE's quality assurance guidelines for the endovascular treatment of occlusive lesions of the subclavian and innominate arteries, served on the Scientific Programme Committee for ECIO 2013, and has given numerous presentations at CIRSE Annual Meetings and ECIO and GEST conferences.

Her work was recognised with the Best Scientific Paper award at ESTI 2005. She was also part of the team awarded the *CVIR* Editor's Medal in 2012.

## Distinguished Fellow

### Gao-Jun Teng

Laudation: Dierk Vorwerk



Dr. Gao-Jun Teng is a professor and the Chair of Radiology and Vascular Surgery at Zhongda Hospital, Southeast University in Nanjing, China.

At the time of Dr. Teng's radiology residency, IR had only just been introduced to China. After a mini-fellowship with Dr. Zhijiang Liu, Dr. Teng decided to pursue a career as an interventional radiologist in 1987. As the first IR at Zhongda Hospital, he began his IR career with interventional oncology. He also performed many "first interventional procedures" at Zhongda Hospital, including transcatheter embolisation for gastrointestinal bleeding and haemoptysis, PTA/stenting for renal arterial stenosis, treatment of Budd-Chiari syndrome, TIPS, percutaneous dissection, percutaneous vertebroplasty, stent grafting for AAA and aortic dissection, IVC filter placement, and RF, cryo- and microwave ablation of tumours.

During his career, Dr. Teng has developed several new techniques and devices, including a unique radioactive stent system for oesophageal carcinoma and biliary tract malignancies, respectively, with a Phase 3 trial published in *Lancet Oncology*, and a new


spiral automated lumbar nucleotome that has been used to treat thousands of patients in China. As a research fellow in Dartmouth-Hitchcock Medical Centre (1995-1998), Dr. Teng was involved in the mechanism study of TIPS restenosis, helping to verify the role of bile leak in TIPS restenosis and use of covered stents.

Dr. Teng is an active researcher. He has authored or co-authored more than 300 publications featured in *Lancet Oncology*, *PNAS*, *Radiology*, *Journal of Hepatology*, *Diabetes*, *CVIR* and *JVIR* as well as 10 Chinese book chapters. He has delivered hundreds of lectures and scientific presentations nationally and internationally. He has also hosted many Chinese scientific conferences. Over the last decade, Dr. Teng has served as editor and associate editor for many journals, including *CVIR* and *Chinese JVIR*.

Dr. Teng was President of the Chinese Society of Interventional Radiology (CSIR) during the term 2009-2011, and is currently the vice-president of the Chinese Society of Radiology, and president-elect of the Asia-Pacific Society of Cardiovascular and Interventional Radiology (APSCVIR) for the term 2014-2016.

**Don't miss it!****Controversies in venous disease treatment  
Special Session**

Saturday, September 26, 11:30-12:30  
Auditorium 6

 e-voting



**Stephen Black**  
Guys and St Thomas'  
Hospital / King's College,  
University of London  
London, UK

Dr. Black is a consultant vascular surgeon at Guys and St Thomas' Hospital, where he is the clinical lead for venous and lymphoedema surgery. He is also Honorary Senior Lecturer at King's College London. Together with colleagues he has established a multi-disciplinary team for the management of complex venous disease. His clinical interests are primarily treatment of deep venous disease and DVT. Dr. Black is an examiner for the Fellowship of the European Board of Vascular Surgery and is on the Programme Committee for Charing Cross and the European Venous Forum Hands-on Workshops.

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**Surgery for Paget Schroetter syndrome is mandatory: pro**

Stephen Black

Paget Schroetter syndrome is a phenomenon of upper limb deep vein thrombosis stimulated by repetitive endothelial damage to the subclavian and axillary veins, resulting in thrombosis.

It is well recognised that anatomical factors which allow for repetitive trauma during the course of exercise (or effort) facilitate and perpetuate this trauma [1, 2]. The anatomical abnormalities that allow the thoracic outlet to be restricted are formed by the first rib, clavicle and scalenus anterior muscle in the main, with contribution from other abnormalities such as the presence of a cervical rib, congenital bands, hypertrophy of scalenus tendons, and abnormal insertion of the costoclavicular ligament. These anatomical factors contribute to the repetitive endothelial injury to the vein, which ultimately results in thrombus formation. The role of other factors such as haematological abnormalities, while undoubtedly part of the process, are less well established [3].

Established practice had, as with lower limb DVT, viewed anti-coagulation alone as the gold standard treatment for DVT of both upper and lower limb. With advancements of, in particular, catheter-directed lysis techniques, it is now increasingly apparent that the long-term consequences of conservative management in a young patient population are unacceptable, with the rate of post-thrombotic syndrome higher in the upper limb than the lower limb [2, 4-6, 7].

The premise is accepted that, ultimately, intervention confers better results; this is predicated



Subclavian vein post-plasty (top picture) and the same patient at 6 weeks without rib resection.

on restoring normal venous outflow from the upper limb and, if performed early enough, maintaining the integrity of the vein and minimising endothelial damage.

Therefore, there are two options for treatment:

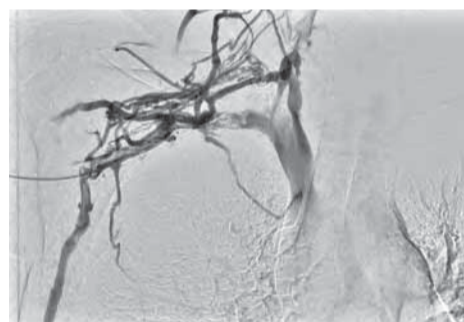
- 1) Venous lysis without surgery (lysis, venoplasty +/- stent)
- 2) Venous lysis plus surgery (+/- venoplasty +/- stent)

The first non-surgical strategy ignores the contribution made by the anatomical factors, and therefore the original underlying risk factor for re-thrombosis remains (Fig. 1).

Published results of the first strategy suggest good results may be achieved in up to 75% of patients (although many studies publish worse results), with the remainder requiring surgery at a delayed interval due to residual symptoms, principally recurrent thrombosis and development of post-thrombotic syndrome.

A strategy of selective surgical intervention after lysis, while in principal sensible to avoid the risks of surgical intervention, is only possible with a robust pathway for identifying which patients would require surgery. No such pathway exists, with current evidence too heterogeneous to allow for meaningful analysis [8].

In addition, venoplasty and stenting without rib resection has extremely poor outcomes due to stent fracture and re-occlusion [2, 8-10].



A recent review of the literature has indicated a clear benefit from a strategy of rib removal. Somewhat surprisingly, the addition of venoplasty to lysis plus rib resection did not appear to confer any additional benefit [11]. However, this is undoubtedly a reflection of the numbers involved in the study, as it continues to seem that venoplasty after first rib resection for a persistent significant stenosis would be advantageous.

This paper suggests symptom relief at last follow-up was significantly more likely in the first rib resection (with or without venoplasty, 95%) than in the rib not removed (54%) group ( $p < 0.0001$ ), as was patency (98% vs. 48%,  $p < 0.0001$  vs. rib not removed). In the papers reviewed, 40% of patients who did not have the rib removed required this at a later stage due to persistent symptoms.

This review did highlight the paucity of robust evidence and the absence of proper trial data to influence current treatment strategies. A randomised trial of lysis plus venoplasty vs. lysis, plus first rib resection and venoplasty, would be beneficial. The experience of trials for ileo-femoral DVT has suggested it would be difficult to randomise patients to conventional treatment vs. any lysis strategy.

It therefore remains, with current evidence, that the best results for the treatment of Paget-Schroetter syndrome are achieved by a policy of catheter-directed lysis and correction of the anatomical abnormality (first rib resection) in all patients who are suitable for intervention.



First rib resection: exposure showing artery, scalenus anterior muscle and vein.

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Cardiovascular and Interventional Radiological Society of Europe

## Surgery for Paget Schroetter syndrome is mandatory: con

Gerard O'Sullivan (EBIR)

The title of this debate is "Surgery for Paget Schroetter syndrome is mandatory". Not only is it not mandatory, it is in fact rarely indicated, as the literature amply demonstrates.

The problem with thoracic outlet syndrome (TOS) is that it is a catch-all term for a wide variety of conditions whose causes are attributed to compression of neurovascular structures as they exit the thorax.

Paget Schroetter syndrome is the venous subset of thoracic outlet syndrome (VTOS): it comprises between 3-10% of all cases of TOS. It is rare; you will see about 45-50 cases of lower-limb DVT for one case of acute VTOS/PSS. That said, acute PSS/VTOS is relatively easy for the trained clinician to recognise, comprising upper limb swelling, pain and colour change most commonly after significant upper limb exertion (throwing a javelin, playing baseball, etc.). It is more common in the dominant arm, and more common in young males.

Apart from truly acute presentations, the diagnosis can be clinically difficult: there is no agreement on what tests to perform. Some rely on colour Doppler US, some insist on venography, some CT/MR – most use provocative arm manipulation. Some use electro-diagnostic stimulation. To me, the best test seems to be an experienced clinician taking a good history, and performing a thorough physical examination on a reasonably intelligent patient within two weeks of the initial onset of symptoms.

For acute axillo-subclavian venous thrombosis, treatment needs to address three problems: the thrombus, the extrinsic compression, and the intrinsic damage to the vein. Initial anti-coagulation often results in rapid symptom relief and no further intervention may be re-

quired. If, however, symptom relief is not great, or the patient's livelihood depends on having an arm that can function at a high level (athlete, musician) then thrombolysis will directly attack the thrombus, followed by continued anti-coagulation for several months. Some authors stop at thrombolysis, while others feel surgery is needed to decompress the area between the back of the first rib and the front of the clavicle. The timing of this is debated. If the vein is damaged, it needs to be gently dilated or perhaps replaced following surgical decompression.

Even if they are "acute" by history (<14 days), often venography reveals multiple collaterals – suggesting that it is acute on chronic – and the collaterals themselves make the game more complicated still. To quote Thomson et al. 2011:

"The presence of good collateral veins on the preoperative venogram suggests that outflow obstruction is longstanding and presents a dilemma. Removal of the first rib may not improve the functional obstruction because it has relied on the collaterals for some time. Conversely, if the rib is resected, preferential flow through the well-established collaterals may steal blood from a stenosed subclavian vein and lead to immediate thrombosis during the postoperative period."

But the reality is that not all patients are gifted athletes/musicians, and they are rarely referred in time: the diagnosis is often delayed or incorrect, and by the time the correct diagnosis is made, the window for thrombolysis has passed and we enter the chronic phase. Here the waters become much more muddied. Accurate distinction between chronic VTOS and neurological TOS is more difficult, as there is significant symptom overlap.

To interventional radiologists, "surgery" would clearly represent some form of open operation, whereas "surgery" to the general public would be taken to include any form of intervention including venography, wire passage, thrombolysis and venoplasty. I am not sure which meaning we should take. In fact, again it doesn't matter because neither "surgery" nor any form of "intervention" are indicated in the vast majority of patients.

The results from surgery vary considerably depending on operator experience. Complications are inevitably under-reported, as low volume centres are unable to present their data. Potential complications from surgery can include pneumothorax, injury to the subclavian artery or vein, injury to the brachial plexus and long thoracic nerve, apical haematoma, intercostobrachial nerve injury, and injury to the thoracic duct.

There is no level 1 evidence to back up this treatment plan. A Cochrane review (2014) concluded that there is a need for an agreed definition for the diagnosis of TOS, agreed outcome measures, and high quality randomised trials that compare the outcome of interventions with no treatment and with each other.

In summary, if we lived in an ideal world where all patients presented acutely, were all gifted musicians who wished to continue on in their chosen career, and you worked in a centre where an experienced vascular surgeon could undertake thoracic outlet surgery within 24 hours of finishing catheter-directed thrombolysis, (and assuming that a good quality RCT is actually done somewhere in the world), then you should consider voting "yes". In the real world, unfortunately, "NO" is the only sensible option.

### Don't miss it!

Controversies in venous disease treatment  
Special Session

Saturday, September 26, 11:30-12:30

Auditorium 6

 e-voting



**Gerard O'Sullivan**  
(EBIR)

University College  
Hospital Galway  
Galway, Ireland

*Dr. Gerry O'Sullivan is a consultant interventional radiologist at the University College Hospital, Galway. He completed his basic training in radiology in Plymouth and St. George's, London, before completing an IR fellowship in Stanford under Mike Dake. He worked as a consultant in Chicago before moving to Galway in 2002. He specialises in vascular procedures, and is particularly well known for his expertise in the venous field, especially DVT. In this respect, Dr. O'Sullivan has been a regular faculty member at CIRSE meetings, actively participating in debates, lectures, panel discussions and workshops each year since 2006.*

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# **CHILDREN'S CANCER CHARITY EVENING**

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and will drop you off at various central locations after the event.**

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*CIRSE supports compliance with ethical standards. Therefore, CIRSE emphasises that the present invitation is directed to participants of CIRSE 2015, and recommends that participants who want to take part in the Children's Cancer Charity Evening bear any and all costs in this context (including donations) themselves.*

*Kindly note that participation in the Children's Cancer Charity Evening is NOT included in the CIRSE 2015 registration fee!*

## Early clinical results of bariatric embolisation

Clifford Weiss, Olaguoke Akinwande, Dara Kraitchman and Aravind Arepally

Obesity is a chronic illness that is currently regarded a public health crisis [1]. Moreover, the World Health Organization recognises global obesity as an epidemic [2], therefore, there is a need to establish effective and safe treatments for this disorder. There are multiple established conditions linked to obesity including diabetes, heart disease, stroke and cancer, to name but a few. Conversely, weight loss decreases the risk of some of these conditions.

The initial management of obesity is lifestyle intervention, which includes diet modification and exercise – the goal being to create a net energy deficit. Unfortunately, most obese patients fail lifestyle modification techniques and resort to surgery. Bariatric surgery (Roux-en-Y gastric bypass, sleeve gastrectomy, gastric banding) in a well-selected population has good efficacy compared to lifestyle modification, but carries a significant risk of minor and major morbidity (10% and 13 %, respectively) [3]. Current pharmacological therapies, while theoretically safer, have not shown results approaching those seen with bariatric surgery.

Bariatric embolisation (BE) is an investigational minimally invasive technique that could potentially result in weight loss by way of ghrelin hormone modulation [4]. Ghrelin is of particular interest because of its potent orexigenic (appetite-stimulating) effects and its abundance in the fundus of the stomach, permitting endovascular targeting. Specifically, embolisation to the arteries supplying the fundus of the stomach inhibits ghrelin-producing cells and consequently decreases the release of ghrelin to the circulation [5-7]. Given the promising findings seen in our animal studies, we are performing an FDA-approved physician-initiated IDE (investigational device exemption) study to determine the safety and early efficacy of this novel technique on human subjects.

### Methods

Our single arm prospective phase I study enrolled morbidly obese adult subjects (BMI of 40-60; weigh <400 lbs/180 kg) without significant co-morbidities. Our protocol was approved by the Institutional Review Board and Federal Drug Administration. Patients were excluded if there was a history of malignancy, vascular disease, diabetes, prior abdominal surgery, variant or prohibitive gastric arterial anatomy, or peptic ulcer disease. The primary

endpoint was 30-day adverse events and weight loss. Secondary endpoints were blood pressure, lipid profile, ghrelin levels, serum obesity hormones (leptin, GLP-1, PYY), eating and hunger/satiety assessments, quality-of-life parameters, food intake and endoscopic assessment.

Patient pre-procedure assessment included pre-procedural CTA, upper endoscopy, gastric emptying study, gastric hormone panels, quality-of-life questionnaire (QOL) and obesity-related psychological assessment. Post-procedural assessment included upper endoscopy (at week 2 and month 3), gastric emptying studies (1 month and 6 months), full laboratory and gastric hormone panels, QOL and obesity-related psychological assessments. The procedure involved a celiac angiogram with cone-beam CT (Siemens Healthcare) to assess the anatomy. Then, subselective left gastric and gastroepiploic angiograms were performed to better assess fundal perfusion. After careful planning, embolisation of one or more fundal arteries was performed with 300-500 µm microspheres. Preliminary results were obtained in our five enrolled patients at the 30-day time point. A paired two-sample t-test was used to evaluate the differences in weight.

### Results

Median BMI at study enrollment was 43.9 (range: 40.2 to 47.8) and median age was 36 years old (range: 31 to 49). After completion of bariatric embolisation in five subjects, there were no major adverse events. Three subjects (60%) were admitted (<48 hour admission) for nausea, vomiting and epigastric pain. A small superficial ulcer was seen in the fundus/ lesser curvature in one patient (20%). After 12 endoscopies in 5 patients, no other ulcers were seen. There was a 4% (SD: 1.7%; p=0.0091) and 5.28% (SD: 3.5%) reduction in excessive weight loss at the 4 and 12-week time points. Mean serum ghrelin decreased by approximately 9% (SD: 35%) at the 4 week time point. Mean serum GLP-1 (a hormone that promotes satiety) increased by 107% at the 30-day time point. Mean serum leptin adjusted for weight also increased by 11% (SD: 41%) at the 30-day time point. Hunger appetite scores dropped sharply in the first 2 weeks following the procedure and showed a steady rise thereafter. At the 30-day time point, subjective hunger did not reach the baseline level. Quality of life was unchanged throughout the study. Lastly, liquid

and solid gastric emptying showed no change from baseline.

### Discussion

Our preliminary findings showed that bariatric embolisation was safe for the treatment of morbid obesity as demonstrated by the lack of high-grade adverse events. As expected, mild gastrointestinal adverse events were seen, which can easily be managed but likely require a short post-procedure inpatient observational period. Given the small sample size in this early stage of analysis, it is difficult to compare morbidity rates with bariatric surgery at this time. Quality of life was preserved throughout the 30-day evaluation period, which implies that the procedure does not interrupt normal daily functioning and may outperform surgery in this regard. Although a conclusion about the efficacy of BE is premature as only five patients were sampled, we can make some preliminary observations.

There was modest but statistically significant mean weight loss at 30 days. Of note: our in-house weight management programme was not mandated after our procedure and, as a result, most patients were not compliant. This implies that the weight loss experienced by our patients was mostly related to the procedure alone, making the observed modest weight loss more impressive. Further, the weight loss curve did not plateau during the 30-day time interval, so we expect more weight loss in the ensuing weeks. Preliminary findings showed no significant change in mean serum hormone levels in our initial dataset. Most likely this is due to the small sample size in this initial phase of our study. Unexpectedly, gastric emptying was unaffected by BAE. This is quite intriguing given the potential ischaemic insult on the gastric fundus and the resulting modulation of ghrelin that is known to interfere with gastric emptying [8]. We will continue to assess trends in hunger hormone levels and gastric emptying in a larger data set as we continue to the phase II stage of our study.

### Conclusion

Our pilot clinical trial shows that BE is safe, feasible and shows early efficacy in regard to weight loss. As the study continues to the planned 20 patients, more insight into the early and longer-term efficacy will be obtained.

### Don't miss it!

#### Bariatric embolisation Special Session

Saturday, September 26, 08:30-09:30  
Auditorium 2



**Clifford R. Weiss**  
Johns Hopkins Hospital  
Baltimore, MD/USA

Dr. Weiss is an Associate Professor of Radiology, Surgery and Biomedical Engineering in the Division of Vascular and Interventional Radiology at the Johns Hopkins Hospital. He received his medical, diagnostic and interventional radiology training at Johns Hopkins and is now also their Director of Interventional Radiology Research and the Medical Director of the Johns Hopkins Center for Bioengineering, Innovation and Design. His clinical practice is currently focused on the treatment of vascular malformations. He serves on numerous policy and review boards within the radiological sciences, and has published over 40 peer-reviewed articles. His research on bariatric embolisation has been done in collaboration with colleagues Dr. Olaguoke Akinwande, Dr. Dara L. Kraitchman and Dr. Aravind Arepally.

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## 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**



## Transradial Access for Interventional Radiology Procedures



Transradial access has become increasingly popular for coronary interventions; the most advantageous aspect being very low access-site bleeding complications, which may help contribute to reductions in the risk of adverse events.

Recently, interventional radiologists have begun to utilize transradial access for procedures – from uterine fibroid embolization, interventional oncology, and trauma.

"Aside from the benefits of earlier ambulation and fewer complications, transradial access procedures are less expensive," says Darren Klass, MD, PhD, Interventional Radiologist, Vancouver Coastal Health, who has performed more than 200 procedures using the radial approach.

**"I have received thank-you notes from the nursing staff because the radial approach requires fewer post-procedure nursing hours."**

"Not going to a radial approach is to do yourself a disservice," says Michael Neuwirth, MD, Interventional Radiologist, Carle Heart and Vascular Institute, Urbana, Ill. "Sticking with the femoral approach for interventional radiology procedures is to keep your head in the sand. I tell my colleagues that the radial approach will change their practices, affect their bottom lines, and is significantly better for patients. I have had a number of patients thank me because their procedures were simpler and less complicated for them. We have seen a great deal of success in a number of procedures that fall outside of cardiac interventions, including AV fistulagrams, fibroid embolizations, mesenteric and renal angiograms and stenting, liver Interventional Oncology, and for standard lower extremity angiograms. You can even use it for subclavian stenting."

Using transradial access for many interventional radiology procedures requires longer catheters than the standard lengths used for cardiac interventions. Merit Medical carries catheters in the lengths and shapes needed for IR procedures. Furthermore, the company offers practitioners the option of customizing catheters to meet their specific shape and length requirements. "Using Merit's catheters, I catheterize to almost any point in the body above the knee," shares Klass.

### Patient Experience with Transradial Procedures

Since 1997, surveys of patients who have had transradial intervention indicate that they are

more satisfied with radial access procedures than with femoral. Most often, patients cited the shorter post-procedure recovery time and earlier times to ambulation; however, less discomfort and pain have also been reported. Patient preference for transradial access could be a motivating factor in the adoption of a radial-first approach for interventionalists. According to Kiemeneij et al., a survey of patients found that 75 percent of the patients who underwent transradial PTCA after transfemoral diagnostic catheterization preferred the radial approach because of post-procedural ambulation. In 1999, a randomized comparison of transradial access on quality of life and cost effectiveness conducted by Cooper et al., discovered that radial was preferred by 80 percent of the patients surveyed. A study of patient experience during PCI using both radial and femoral access by Geijer et al. in 2004 included a patient questionnaire that asked patients to rate the discomfort and pain they felt during and after the procedure. Patients graded discomfort and pain much lower when using radial access.

The 2011 RIVAL trial reported that 90 percent of the patients who had transradial approach said they would prefer it if an additional procedure were needed. In a patient satisfaction survey conducted from October 2010 to April 2011 by the Jesse Brown VA Medical Center in Chicago, 97 percent of the 32 patients surveyed said they preferred the radial procedure; 91 percent rated the radial procedure an 8 on a scale of 1 to 10; and 94 percent would recommend the radial approach over the femoral.

### Learning Transradial Access

Merit Medical will be conducting a ThinkRadial™ course for Interventional Radiology, October 22–24, 2015, at their South Jordan, Utah, headquarters. Dr. Klass will be leading the IR track of the course, while Sandeep Nathan, MD, will conduct the interventional cardiology track.

Islam A. Shahin, MD, Interventional Radiology, Methodist Dallas Medical Center, recently attended the ThinkRadial™ course. "I got a lot out of the course, particularly in the hands-on portion. The practical training that Merit Medical provides saves time and allows attendees to have hands-on practice using cutting-edge technology. Having experienced operators on hand to answer questions was a great benefit."

"Merit's training was a class act," says Dr. Neuwirth. "The course gave me the opportunity to practice the radial approach and understand the nuances of the procedure while interacting

with peers. The way that Merit ran the ThinkRadial™ course is that they cover several types of procedures and give real-world tips and tricks on how to be successful for the different kinds of procedures. I left the course feeling like I was ready to do radial access."

**"I got a lot out of the course, particularly in the hands-on portion. The practical training that Merit Medical provides saves time and allows attendees to have hands-on practice using cutting-edge technology. Having experienced operators on hand to answer questions was a great benefit."**

"I am very honored to work with Merit on the ThinkRadial™ course specifically designed for interventional radiologists," says Dr. Klass. "The obvious benefits of transradial access have been proven in other disciplines and will continue to be adopted by radiologists."

The ThinkRadial™ course is also unique because the senior leadership of Merit Medical participates. "It was very nice to see firsthand how Merit works, what drives them, seeing the actual CEO, CFO and CMO, speak with them and hear their visions. At one meal during the conference, the senior management of Merit spent time asking participants what our priorities and needs are. It was eye opening," says Dr. Neuwirth.

To learn more about Merit Medical's ThinkRadial™ program, including upcoming training opportunities, go to [www.ThinkRadial.com/CIRSE](http://www.ThinkRadial.com/CIRSE).

"While there's not much in the peer-reviewed literature on transradial access for Interventional Radiology, I feel that will soon change," says Dr. Klass. "Until the literature catches up, the course in October will be practical and hands-on, not a literature review."

"I am very selective about attending any event that takes me away from my family," shares Dr. Neuwirth.

**"The Merit ThinkRadial™ course was worth the time investment."**

"I got a great deal from the course that I am implementing into my practice," says Dr. Shahin. "The people at Merit were gracious and helpful, and I really enjoyed the course." ○

#### SOURCE MATERIALS

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## CIRSE SYMPOSIUM Transradial Approach in Interventional Radiology

Sunday, Sept. 27, 2015  
Auditorium 6, 13:00 – 14:00  
Moderator: Prof. Dr. Christoph A. Binkert  
Speakers: Dr. Aaron M. Fischman  
and Dr. Darren Klass

To learn more about the radial approach, including our upcoming training opportunities, please visit:

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POWERED BY





## Should balloon angioplasty be the first-line treatment for infrapopliteal disease?

Thomas Rand (EBIR)

It is now more than a decade since we began discussing the endovascular treatment of infrapopliteal disease.

Back then, research was investigating plain balloon angioplasty (POBA) vs. stents vs. surgery vs. conservative treatment. Later, covered and coated stents entered the fray, which made things more complex still, and recently a whole new generation of balloons has become available; particularly drug-coated balloons, which have created even more fascinating possibilities to match one against the other. It's a thrilling time to be involved in this field. As always, when a new technique comes along, our early conclusions were mostly: "further studies are needed..."

And now, several years and many studies later, do we have any answers?

Well, I would say: yes, we do.

### The evidence

Let us start with the studies, before coming to the interpretations.

Recent publications presented the results from meta-analyses of drug-eluting balloon (DEBs) and drug-eluting stent (DES) placement, were DEB and DES demonstrated superior outcomes compared to PTA and bare-metal stents (BMS). At the same time, several current investigations have changed their study questions and endpoints from evaluation of numeric results, such as restenosis, and freedom of re-intervention, to clinical aspects, such as improvement of clinical results or freedom from amputation.

As a further and very effective development in the PTA section, drug-coated balloons have recently come into use and are a strong new tool for the treatment of long segmental lesions, and have shown absolutely promising results.

In the DEBATE study, drug-eluting balloons strikingly reduced one-year restenosis, target lesion revascularisation and target vessel occlusion in the treatment of below-the-knee lesions in diabetic patients with critical limb ischaemia, compared with PTA.

When comparing Paclitaxel-coated balloons (PCB) vs. DES in long infrapopliteal lesions, another recently published prospective randomised controlled trial demonstrated that DES are associated with significantly lower residual immediate post-procedure stenosis and have shown significantly reduced vessel restenosis at six months. PCB, however, might produce positive vessel remodeling. Generally authors considered DEB as the leading approach in below-the-knee disease.

In sum, I would say we can conclude that "coating" is better than "no coating"; however, the optimal matching of stents and balloons requires some fine-tuning.

### Daily practice

This brings us to the next point, which is our daily work and general approach to infrapopliteal vessel disease.

As a general rule, efficient treatment is based on the biological behaviour of the underlying disease and on the appropriateness of methods and techniques.

Particularly for infrapopliteal lesions, the biological background is crucial. Patients with diabetes mellitus, which is frequently associated with small vessel disease below the knee, present with long diffuse arteriosclerotic disease. Highly calcified and rigid stenoses, as well as long occlusions exist, and more than 80% of lesions are more than 10 cm in length.

Due to the background and nature of BTK lesions, it is essential to treat this special group of lesions with dedicated tools and concepts, and as simply and effectively as possible:

Low-profile balloons up to 20 cm in length contribute substantially to the successful treatment of such long BTK lesions. Although a true lumen approach will generally be considered as a first-line technique for longer lesions, it is acceptable if not beneficial to carry out angioplasty for longer segments from a subintimal tract by using a hydrophilic guidewire.

Fantastic techniques have been successfully used and described by several interventionalists. By using micropunctures of pedal arteries, infrapopliteal arteries can be accessed with a retrograde technique, and/or an

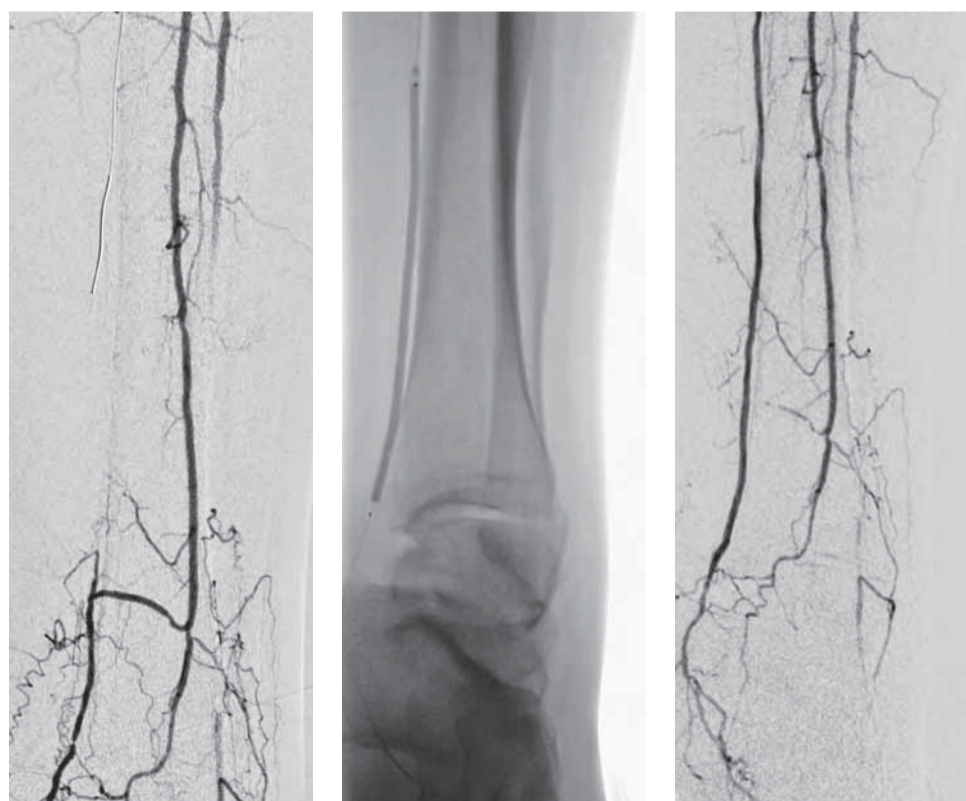
antegrade-retrograde access can be created, resulting in pedal-plantar loop techniques, or subintimal flossing, which was first described as the SAFARI technique. Pedal-plantar loop techniques can create a guidewire loop from the anterior tibial artery to the posterior tibial artery through the pedal arch. Such techniques facilitate the recanalisation of long segments of infrapopliteal pedal and plantar arteries.

So, if we put all this together, and combine study results with the biological background of BTK lesions and a clinical approach to daily practice, PTA is most effective and makes it easy and quick to treat long lesions.

These considerations are reflected by an obvious change in paradigms for the treatment of long infrapopliteal lesions: the revised TASC-II guidelines note "increasing evidence to support a recommendation for angioplasty in patients with CLI and infrapopliteal artery occlusion" and lesion length is no longer used to determine a recommendation for treatment.

Regarding stents, however, such treatment options are still very efficient regarding more focal and short segments, or bail-out procedures.

In conclusion, angioplasty of infrapopliteal lesions can achieve excellent clinical results with the proper use of dedicated techniques and devices. With the current developments, and proper consideration of the biological background of lesions, PTA shows itself to be a fast and effective tool, which should be considered as a first-line therapy.



### Don't miss it!

Evidence Forum: Peripheral angioplasty  
Special Session

Saturday, September 26, 10:00-11:00

Auditorium 1



**Thomas Rand**  
(EBIR)

General Hospital Hietzing  
Vienna, Austria

Prof. Thomas Rand is an interventional radiologist and Head of Radiology at Hietzing General Hospital, Vienna. He graduated from the University of Vienna, specialising first in osteoradiology, and later in interventional radiology. He completed his professorial thesis in 2000 on the diagnosis of rheumatological illnesses. Prof. Rand completed fellowships at New York University and the University of California, San Diego. He has been author or co-author on over 100 peer-reviewed articles and 10 books. He is a member of numerous scientific societies, and is much involved with research and education, as well as being an active faculty member at CIRSE meetings.

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Even long occlusions in the lower leg (Fig.1) can be treated effectively with long balloons (Fig. 2) and the vessels functionally and morphologically recreated (Fig. 3). All figures courtesy of Dr. Gerard Mertikian, who performed this investigation recently in our department.



ESIR 2015

Expert Course

European School of Interventional Radiology

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

## Remembering François Pinet



François Pinet left us on July 22, 2015. We would like to honour him and remember the important role that he played in the foundation of CIRSE. Trained in cardiology by Roger Froment, he was one of the pioneers of this kind of radiology in France and Europe; he took part in the world's first-in-man coronarography using the Arnulf method.

In France, Prof. Pinet motivated young students to pursue this clinical specialty. With his wife, Annick, he created a school and sent his students abroad. He led the two volumes of this discipline concerning the "Radiodiagnostic Treaty". With the help of Ecoiffer, he founded the Vascular Radiology French Society. Between 1977 and 1980 he was the president of CERF (college for radiology teachers in

France) and in 1986 he became president of the SFR (French Society of Radiology).

Since 1976 he organised the International Society of Cardiac and Vascular Radiology Congress in Lyon. He was instrumental in the merger of the two existing societies (the European College of Angiography and the European Society of Cardiovascular and Interventional Radiology), convincing Lunderquist and Boijesen in northern Europe and Lamarque and Rossi in southern Europe. Together with Prof. Olbert, he organised the inaugural CIRSE congress in 1985! He acted as general secretary, and then became a Gold Medallist in 1991.

Michel Amiel

## A tribute to Jean Claude Gaux



Professor Jean Claude Gaux passed away on July 9, 2015.

His demise is a severe loss for the field of cardiovascular, diagnostic and interventional radiology in France and Europe.

He was one of the major contributors to the development of important interventional techniques such as peripheral and renal artery stenting, aortic endografting, carotid stenting, development of IR techniques in haemodialysis grafts, and many, many more.

He was also one of the founding members of the French Society of Cardiovascular Imaging (SFICV), and in recognition of his contribution to French and European IR, was awarded Distinguished Fellowship of CIRSE in 2000.

All his students and fellows are forever in debt to his extraordinary enthusiasm, teaching and research capabilities. The French cardiovascular community has benefitted greatly from his wisdom and dedication, and his loss is keenly felt by us all.

Marc Sapoval

## Poster Awards 2015

### SCIENTIFIC POSTERS

#### Magna Cum Laude

Foot perfusion CT: an experimental validation and an initial clinical experience  
*S. Hur, H.J. Jae, J.E. Kim, C.S. Kim, S.H. Lee, S. Cho; Seoul National University, Radiology, Seoul/KR*

#### Cum Laude

Comparison of pharmacokinetics and drug delivery properties of doxorubicin/Lipiodol® formulations in a hepatocellular carcinoma (HCC) rabbit VX2 model  
*F. Deschamps, G. Farouil, C. Hollenbeck, J.-F. Mayer, L. Tselikas, S. Catoen, C. Robic, W. Gonzalez, T. de Baère; IGR, Interventional Radiology, Villejuif/FR, Guerbet, Guerbet France, Villepinte/FR*

Clinical results of PADI trial: percutaneous transluminal angioplasty versus drug-eluting stents for infrapopliteal lesions in critical limb ischaemia

*M. Spreen, J. Martens, W.P.T.M. Mali, H. van Overhagen; I Haga Ziekenhuis, Radiology, The Hague/NL, University Hospital Utrecht, Dept. of Radiology, Utrecht/NL, Haga Teaching Hospital, Leyenburg, Radiology, The Hague/NL*

#### Certificate of Merit

The influence of metallic implants on the dissipation of thermal energy during irreversible electroporation  
*H.J. Scheffer, J.A. Vogel, W. van den Bos, K.P. van Lienden, J.H. Klaessens, R.M. Verdaasdonk, M.R. Meijerink; VUMC, Radiology and Nuclear Medicine, Amsterdam/NL, AMC, Surgery, Amsterdam/NL, Academic Medical Center, Urology, Amsterdam/NL, AMC, Radiology, Amsterdam/NL, VU University Medical Center, Physics and Medical Technology, Amsterdam/NL*

Pharmacokinetics and safety of transarterial sorafenib chemoembolization in VX2 tumor model of rabbit liver  
*G.M. Kim, M.D. Kim, J.Y. Won, S.I. Park, D.Y. Lee, W. Shin, M. Shin; Severance Hospital, Yonsei University College of Medicine, Radiology, Seoul/KR*

Balloon pulmonary angioplasty for chronic thromboembolic pulmonary hypertension (CTEPH)

*M. Toborek, A. Torbicki, M. Kurzyńska, S. Darocha, R. Pietura; Medical University of Lublin, Department of Radiography, Lublin/PL, Medical Centre of Postgraduate Education, European Health Centre Otwock, Department of Pulmonary Circulation and Thromboembolic Diseases, Otwock/PL*

Long-term (>5 years) clinical and histological follow-up of successful radiological percutaneous treatment of biliary strictures in pediatric liver transplant recipients  
*R. Miraglia, L. Maruzzelli, M. D'Amico, A. Luca; Mediterranean Institute for Transplantation and Advanced Specialized Therapies (ISMETT), Diagnostic and Interventional Radiology, Palermo/IT*

Effect of body composition on liver hypertrophy after portal vein embolization prior to major liver resection measured by CT volumetry  
*I. Dudás, Z. Straky, É. Török, P. Péter, A. Zsírka-Klein, O. Hahn; Semmelweis University, Department of Diagnostic Radiology and Oncotherapy, Budapest/HU, Semmelweis University, 1st Department of Surgery, Budapest/HU*

### EDUCATIONAL POSTERS

#### Magna Cum Laude

Embolization of hemorrhoidal arteries: the emborrhoid technique  
*N. Moussa, F. Tradi, C. Del Giudice, O. Pellerin, V. Vidal, M.R. Sapoval; Hôpital Européen Georges Pompidou, Vascular and oncological Interventional Radiology, Paris/FR, Hôpital de la Timone, Radiology, Marseille/FR, Hôpital Timone Adultes, Service de Radiologie, Marseille/FR*

#### Cum Laude

The role of IR in the treatment of benign bone and soft tissue tumours: current status  
*G. Tsoumakidou, V. Petsatodis, M.-A. Thénint, J. Garnon, G. Koch, J. Caudrelier, A. Gangi; University Hospital of Strasbourg, Interventional Radiology, Strasbourg/FR*

Balloon-occluded retrograde transvenous obliteration for gastric varices with foam sclerosant: how foam sclerosant changed our procedure  
*K. Yamada, M. Yamamoto, M. Horikawa, H. Shinmoto, T. Kajii; National Defense Medical College, Radiology, Tokorozawa/JP, Oregon Health & Science University, Dotter Interventional Institute, Portland, OR/US*

#### Certificate of Merit

Percutaneous cryoablation of the celiac plexus in cancer patients  
*E. de Kerviler, C. de Margerie-Mellon, A. Coffin, C. de Bazelaire; Saint-Louis Hospital, Department of Radiology, Paris/FR*

Superior hypogastric nerve block for acute pain control in uterine fibroid embolization  
*B. Almazedi, J. Yoon, D.A. Valenti, L.-M.N.J. Boucher, T. Cabrera, C. Torres; York Teaching Hospital NHS Foundation Trust, Radiology, York/UK, McGill University Health Centre, Radiology, Montreal, QC/CA*

The role of interventional radiology in managing invasive placenta  
*R. Zener, D. Wiseman, A. Mujoomdar; London Health Sciences Centre, Department of Medical Imaging, London, ON/CA*

Pelvic venous anatomy: all that we need to avoid complications during venous pelvic or gonadal embolization  
*J.M. Lozano, G.F. Mejia, H.A. Jaimés; Clínica Universitaria Colombia, Interventional Radiology, Bogota/CO, Clínica Universitaria Colombia, Vascular Surgery, Bogota/CO, Clínica de Marly, Interventional Radiology, Bogota/CO*

Interventional radiology in pregnant and lactating patients: fetal and neonatal risks  
*R. Ramnarine, G.T. Yusuf, P. Kane, M. Daneshi, A. Pascoal, T. Bangay, C.J. Wilkins, D.R. Evans, D. Huang, T. Ammar; King's College Hospital NHS Foundation Trust, Radiology, London/UK, King's College Hospital NHS Foundation Trust, Physics, London/UK*

## Raising awareness of radiation protection – the CIRSE 2015 activities

Awareness of radiation-related health risks is on the rise, but pushing practitioners and institutions to adopt meaningful measures to reduce that risk can be challenging. CIRSE's Radiation Protection Pavilion, which made its debut last year, again aims to encourage medical professionals to actively protect themselves by providing practical information, outlining available solutions and offering relevant services.

### New Features

This year's Pavilion places great emphasis on interactivity, and includes several new features that make it a particularly unique educational experience. For example, congress delegates are invited to practice on a radiation safety simulator, interact with a special Kinect tool that visualises scatter radiation, and test their knowledge in a radiation protection quiz.

Delegates are also encouraged to participate in a raffle designed to both raise awareness and put them in the running for some great prizes that will help improve their departments' radiation safety. Each copy of Congress News comes with a sticker displaying a radiologist who is failing to take proper precautions. Delegates can obtain the proper protective kit by visiting any of the exhibitors in the Pavilion, who will provide them with the missing parts, which can be peeled off and added to the stickers. The backing card will then serve as a raffle ticket; delegates should fill in their name, ID number and email address, and hand it in. We also encourage everyone who has participated to place the completed sticker onto their jacket or congress bag to further raise awareness.

### Practical Information in Diverse Formats

This year's event also includes short presentations by experts, hosted by the Radiation Protection Subcommittee and select industry partners – an excellent opportunity to engage in live exchanges on hot topics in radiation safety and receive practical tips for your day-to-day work. The presentations will take place directly in the Pavilion during breaks in the official scientific programme. The full list of today's "RPP Mini Talks" is printed below.

In addition, a selection of tailored informational material, scientific publications and info posters on radiation safety and dose management is on display and available to take home.

The Pavilion also makes available recently published guidelines on radiation protection in interventional procedures, as well as new occupational exposure limits and reporting obligations introduced by the updated European Basic Safety Standards Directive.

For those interested in the most recent scientific findings on health risks related to occupational radiation exposure, the Radiation Protection Subcommittee has compiled an abstract book covering occupational health hazards in interventional radiology; eye-lens dose and radiation-induced cataracts; efficacy of radiation protection equipment; radiation protection of patients; and recommended ICRP publications. Copies of this publication can be picked up at the Pavilion.

### Eye Check-Ups for Members

To address the risk of radiation-induced cataracts faced by IRs, sub-capsular opacity screening is again being offered in two rooms of the Pavilion, from today through Tuesday. Two qualified ophthalmologists are performing the screening, which is free of charge and available to all CIRSE members. While all members received invitations to pre-register for these check-ups in advance, onsite registration may still be possible. If you are interested in making use of this great service but have not pre-registered, please feel free to stop by the Pavilion to see about availabilities.

### Scrutinising Solutions: Real-Time Dose Monitoring

While most practitioners acknowledge that radiation safety is an important issue, opinions diverge when it comes to deciding on how to best reduce exposure. A special session on "Controversies in radiation safety" will delve further into one possible solution, scrutinising the value of real-time dose monitoring of staff. The session will feature presentations by Prof. Werner Jaschke (Innsbruck/AT), Chairperson of the Radiation Protection Subcommittee, and Prof. Efstathios Efstathopoulos (Athens/GR), a member of the committee.

According to Prof. Jaschke, current practice generally involves operators wearing badges and rings to measure their personal dose, with operators receiving monthly reports on their dose, usually at the end of the following month. Given that time range, it can be very difficult for practitioners to gauge whether the

dose is within an acceptable range, especially when many or particularly complex cases are involved.

By contrast, a real-time dosimetry system gives every individual operator easy access to personal exposure data for each procedure performed, with time-stamped dose data helping to identify the procedure or specific step taken during a procedure that is responsible for the highest exposure during a work day, week or month. As Prof. Jaschke notes:

*By providing easily accessible information about radiation exposure, real-time dosimetry systems allow medical staff to immediately change their behaviour in order to minimise their radiation dose. Also, operators obtain immediate information clarifying to what extent their individual dose is increased when they change their position to the patient, change the settings of the angiographic equipment or, for example, take a magnified view or an angled or lateral view of a region of interest.*

He also notes that the use of new software in angiographic equipment may be giving staff members a false sense of security, discouraging them from strictly adhering to previously employed optimisation strategies. With real-time dosimetry, any malfunctions become immediately obvious, and appropriate steps can be taken to re-optimize the angiographic equipment. For all these reasons, Prof. Jaschke is strongly in favour of using real-time monitoring, noting that "it can only bring gains – lower doses, more confidence and a higher awareness of good practice".

Prof. Efstathopoulos acknowledges that real-time feedback on radiation dose may decrease exposure, and notes that the gold standard for radiation monitoring currently consists of personal dosimetry with the use of passive personal dosimeters. However, he points out that such monitoring does also entail some drawbacks:

*The utilisation of extra sensors in addition to the personal dosimeters already in use may cause some inconvenience to the staff, given that they will have additional parameters to think about during the preparation for a procedure. Moreover, in some cases, such as in departments where radiation protection culture is not well-developed, or for staff members who are not very familiar with ionising radiation, the indication of the active dosimeter may be misinterpreted.*

### Don't miss it!

**Controversies in radiation safety  
Special Session**  
Saturday, September 26, 11:30-12:30  
Room 5.A

 e-voting

*There are also some cases in which the presence of a real-time dose monitor on-site might be ignored by the staff. For example, if this kind of system has been installed in a department for a long time, one might stop looking at it. Also, for sophisticated procedures that usually entail higher radiation doses compared to "standard" ones, staff may neglect to check the monitor. In any case, it is difficult to remember what happened during a procedure if data are not analysed afterwards by a physicist or someone else with good knowledge of radiation protection.*

Prof. Efstathopoulos therefore believes that, while real-time monitoring systems can indeed be useful tools to raise awareness amongst the staff, they do not diminish the importance of the TLD or other legal dosimeters.

### Be Part of the Solution

We hope many of you will stop by the Pavilion to inform yourself, interact with experts, test your knowledge, and help us spread the word about the importance of effective radiation protection!

## Today's RPP Mini Talks

### Saturday, September 26

12:30 – 13:00

**RPP Opening Ceremony 2015**  
W. Jaschke (Innsbruck/AT)

14:00 – 14:15

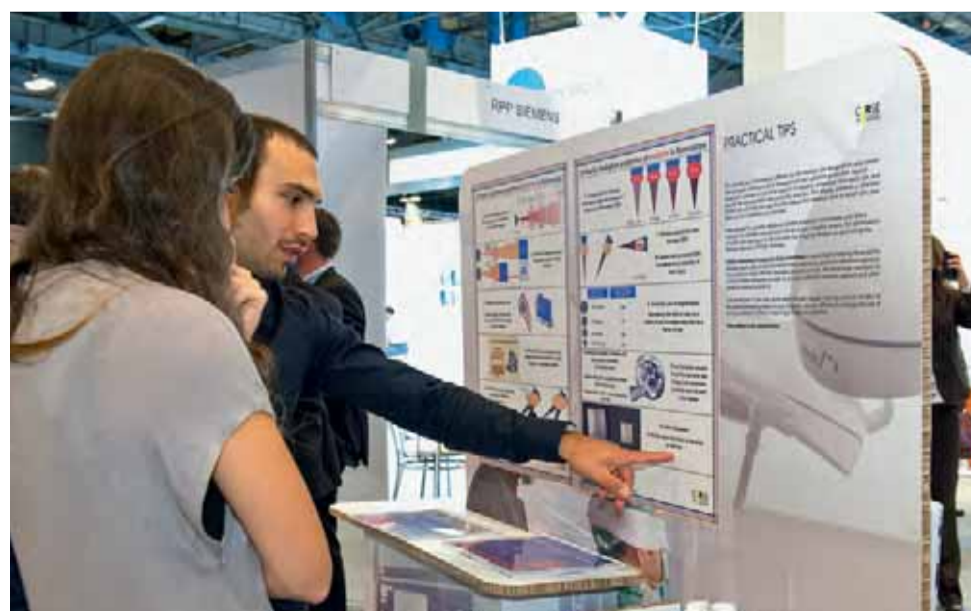
**Why radiation protection matters**  
E. Brountzos (Athens/GR)

14:15 – 14:30

Industry presentation – TOSHIBA  
**DoseRite, better protection for patients and clinicians**  
A. Patz (Zoetermeer/NL)

16:00 – 16:15

Industry presentation – RADPAD  
**Radiation related illness to operators/ interventionalists**  
E. Radtke (Kansas City, KS/US)



# Pulmonary Embolism Protection with the Capturex® Device

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The Straub Medical Capturex® peri-interventional filter catheter is designed to overcome the limitations of currently available IVC-filters including impossibility to mechanically empty the filter from massive clot load, limited filtration abilities, inability to retrieve, migration, perforation and damage to the caval wall. Regarding its dimensions and construction, the CAPTUREX® device is clearly designed for the use in the central venous system, i.e., the vena cava inferior and superior.

The filter catheter consists of a wire reinforced shaft with an outer diameter of 10F and a working channel with an internal diameter of 6F. By slowly pulling back the introducer sheath, the tulip-formed nitinol filter basket opens distally to its full expansion. Capturex® is then covering the whole caval lumen of diameters from 20-30 mm, but simultaneously keeping the vessel patent for the blood flow.

Capturex® offers the physician the high effective safety net for his percutaneous endovenous DVT treatments he was looking for. It enables an even more aggressive approach to the thrombus load without an increased risk of an acute pulmonary embolism.

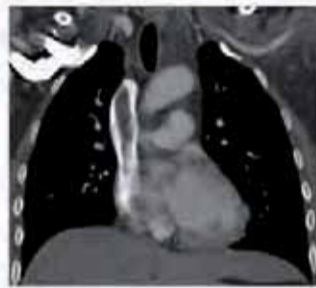


## Key features of the system include:

- Complete filtering of emboli the vena cava inferior or superior during thrombectomy procedures
- Self-centering, no-tilting
- Total trans-luminal filtration across the entire lumen of the vessel
- Capturing thrombi and detritus with high efficiency
- Preventing embolisms to the lung arteries or paradox embolisms to the arterial system
- Safe retraction of the captured material, even if infectious, from the central venous system
- Immediate and easy removal of the whole system after the intervention.

After the intervention, clots, which had been trapped in the Capturex® system, can be easily removed, either by the use of a Straub Medical 6F Aspirex®S catheter through the working channel of the Capturex® shaft, or by using the same Aspirex®S catheter, which had been used to remove the thrombotic material of e.g. the underlying DVT, by approaching the protection device from its open distal filter basket side.

- The Catheters of the Straub Medical Aspirex®S family are approved and indicated for use in acute thrombotic or thromboembolic occlusions, especially in veins or dialysis grafts, where the fast and reliable removal of fresh thrombus is necessary: They feature superior properties of high volume continuous aspiration and transport of the aspirated thrombotic material into a collecting bag outside the patient. Aspirex®S catheters are able to fragment less organized clot without the simultaneous use of thrombolytic drugs.



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Cardiovascular and Interventional Radiological Society of Europe

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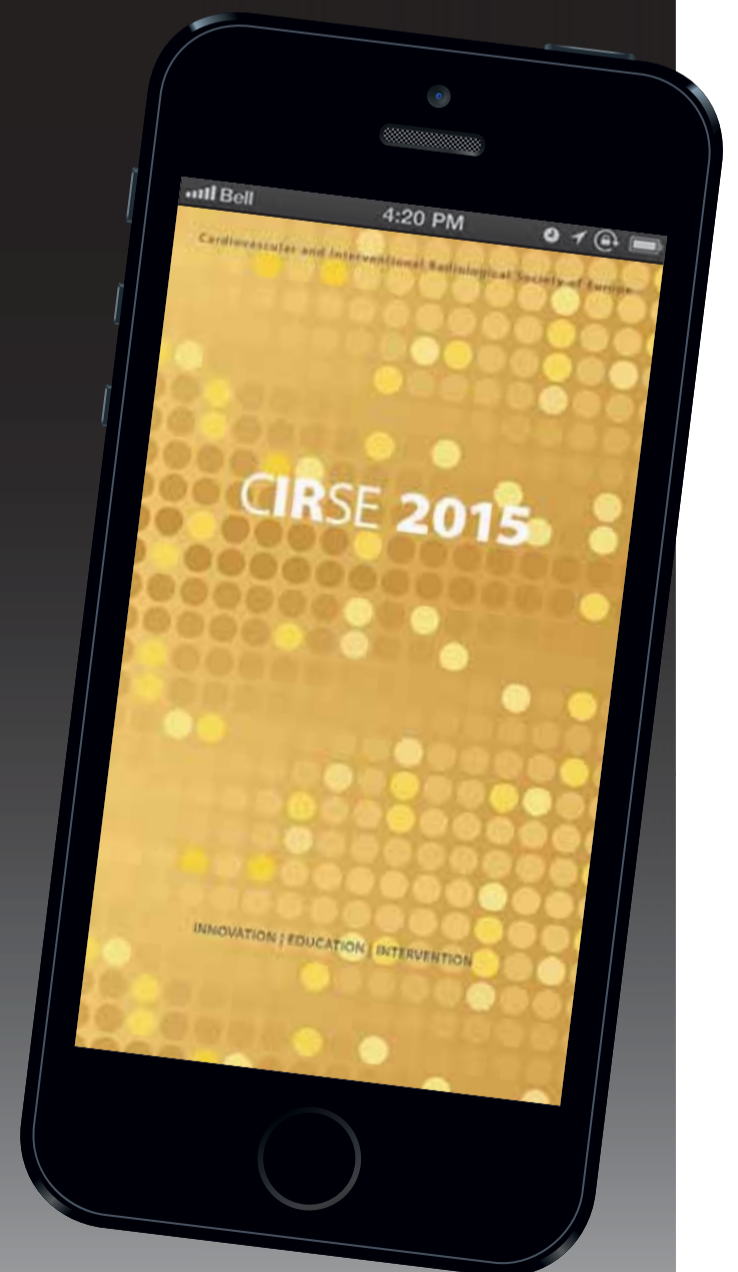
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## Where do we stand on "one-stop-shop" flat-panel angi-stroke imaging?

Christian Stroszczynski

Flat-panel angiography is a new technique which enables high-resolution images of neurovascular structures as well as cross-sectional imaging of the brain when 3D angiography is performed (DynaCT, cone-beam CT). To obtain 3D images in the angiosuite, the flat panel rotates quickly around the neurocranium, usually after intra-arterial injection of contrast media. Backprojection of acquired data enables three-dimensional reconstruction of intracranial arteries based on data sets which covers the whole head in one rotation because of the large field of view of the flat panel. In contrast to conventional computed tomography with multi-slice detectors, the spatial resolution and the conspicuity of the vessels are superior. Using high-resolution mode, the spatial resolution of rotational angiography is 200 µm, which is one third when compared to resolution obtained with standard MS-CT. On the other hand, contrast resolution of soft tissue structures such as brain parenchyma is still reduced when compared to MS-CT. Because direct visualisation of acute brain infarction with typical minimal alterations of tissue density remains challenging for rotational angiography, the vast majority of radiologists will relinquish the use for diagnosis of acute stroke.

However, early data suggest that the vast majority of intracranial bleeding in cases of stroke should be detected or excluded by the flat-panel CT technique. In addition, perfusion analysis for the detection of penumbra areas is introduced for routine clinical use.

Very recently, the enormous impact of early thrombectomy in acute stroke was demonstrat-

ed. Due to the fact that in acute stroke cases even a reduction of a few minutes between clinical symptoms and intervention has a proven impact on the outcome ("time is brain; every minute counts"), new strategies such as one-stop flat-panel angiography seems to be possible.

On the other hand, there is still a lack of evidence concerning the accuracy of cross-sectional images based on flat-panel angiography. In addition, low prevalence in patients who are suitable for thrombectomy is the biggest barrier for switching from actual management of stroke from multi-slice computed tomography as the standard modality to the angiosuite.

While the clinical benefits of diagnostic rotational angiography are still limited, peri- and post-procedural cross-sectional images are of additional value. The use of rotational angiography ranges from the visualisation of ventricular systems, brain tumours and other soft tissue pathologies as well as bone structures, which allows the evaluation of difficult anatomies, the detection of bleeding or other complications, which might be easily missed in a 2D view and only detected hours later in a post-procedural CT.

Both pre-operative and peri-interventional CT/MRI data may be fused with rotational angiography. When pre-operative cross-sectional data sets are used, image-fusion software must correct the different positions of the head on diagnostic images and during hybrid surgery. Usually, the use of fusion software is still somewhat time-consuming and somewhat imprecise. The longer acquisition time of rota-

tional angiography implicates a higher rate of relevant motion artifacts when compared to MS-CT.

Various algorithms may reduce motion artifacts, but the radiation dose needed for diagnostic images is high and induces a higher risk for damage to the brain and especially of the lens.

Especially in cases where the angiosuite is integrated into a multidisciplinary setting, ventricular drainages, biopsies and various image-guided therapies might be more easily performed because of the combination of real-time fluoroscopy and the three-dimensional visualisation of targets and devices.

Image overlay of intracranial stents to 3D angiograms is another valuable tool which facilitates neurointerventional procedures. Dissections involving intracranial arteries are sometimes difficult to assess using conventional digital subtraction angiography (DSA) and can be easily visualized by rotational angiography.

In conclusion, flat-panel angiography using modern dose-sparing detectors are valuable tools for the peri- and post-procedural image guidance of intracranial procedures. Until now, clinical use of one-stop-shop angiography in stroke patients is still in its infancy due to both limited contrast resolution and logistical reasons. However, a massive reduction of door-to-needle time in stroke patients suitable for thrombectomy can be obtained, especially in hospitals where MS-CT is the bottleneck in diagnostic pathways.

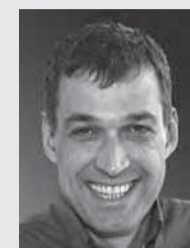
### Don't miss it!

In-depth diagnostic and treatment concepts in acute stroke

Special Session

Saturday, September 26, 10:00-11:00

Room 5.A



**Christian Stroszczynski**  
University Clinic Regensburg  
Regensburg, Germany

Prof. Stroszczynski is an interventional radiologist and Director of the Institute of Diagnostic Radiology in University Clinic Regensburg. He was previously employed as deputy director and clinical lead at the Institute of Diagnostic Radiology in the Carl-Gustav-Carus University in Dresden. His clinical expertise spans hepatology, oncology and vascular interventions, and he is one of the region's leading experts on interventional radiology. In his role as vice-chair of the German Society of Interventional Radiology (DeGIR), his aim is to improve the integration of interventional treatment of stroke into patient care pathways. He has published almost 350 scientific articles, spanning a wide range of clinical topics.

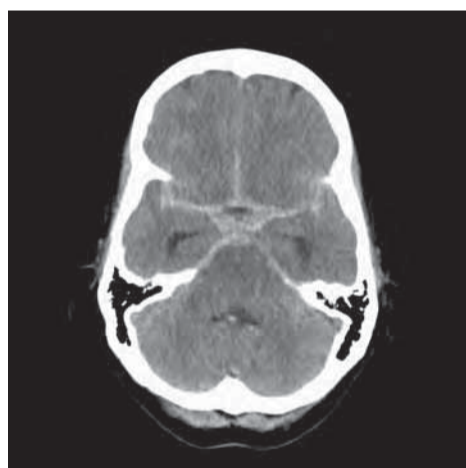


Fig. 1a: multi-slice CT

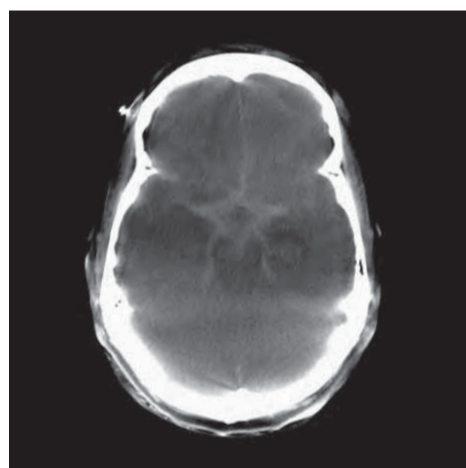


Fig. 1b: flat-panel angiography



Fig. 1c: digital subtraction angiography

Figure 1: (a) multi-slice CT and (b) flat panel angiography in one patient with (c) subarachnoid bleeding based on ruptured anterior communicating artery aneurysm. Despite the fact that image quality is reduced on flat-panel angiography, image quality is sufficient for diagnosis of SAB.

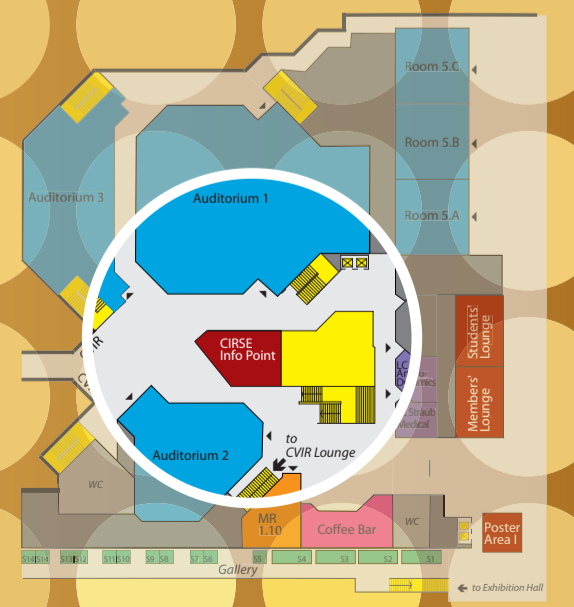
#### References:

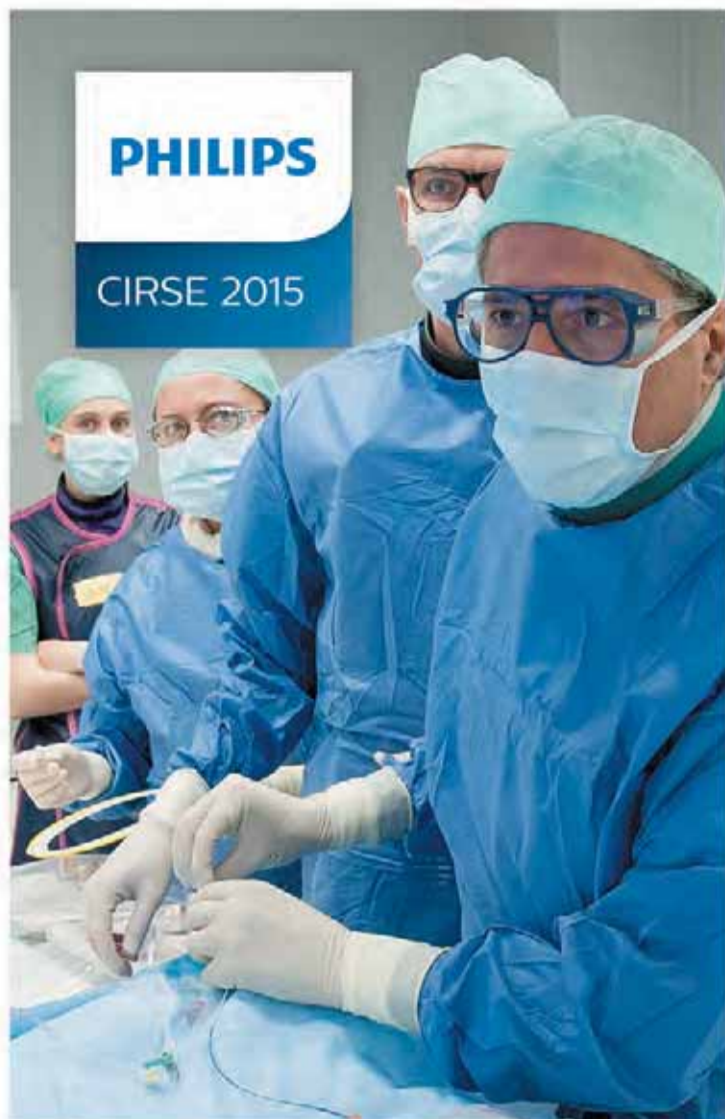
1. Patel AP, Gandhi D, Taylor RJ, Woodworth G. Use of Dyna CT in evaluation and treatment of pseudoaneurysm secondary to craniofacial tumor resection: Case report and diagnostic implications. *Surg Neurol Int.* 2014
2. Ganguly A, Fieselmann A, Boese J et al.: In vitro evaluation of the imaging accuracy of C-arm conebeam CT in cerebral perfusion imaging. *Med Phys.* 2012 Nov;39(11):6652-9
3. van den Berg LA, Koelman DL, Berkhemer OA et al: Type of Anesthesia and Differences in Clinical Outcome After Intra-Arterial Treatment for Ischemic Stroke. *Stroke.* 2015 Apr 7
4. Borst J, Marquering HA, Beenen LFM et al. Effect of Extended CT Perfusion Acquisition Time on Ischemic Core and Penumbra Volume Estimation in Patients with Acute Ischemic Stroke due to a Large Vessel Occlusion. *PLoS ONE* 2015; 10(3) e0119409
5. Jovin TG, Chamorro A, Cobo E et al.: Thrombectomy within 8 Hours after Symptom Onset in Ischemic Stroke. *N Engl J Med.* 2015 Apr 17
6. Berkhemer OA, Fransen PS, Beumer D et al.: A randomized trial of intraarterial treatment for acute ischemic stroke. *N Engl J Med.* 2015 Jan 1;372(1):11-20

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 Auditorium 6



**Chair: Dr. J. Geschwind**  
*Yale University, New Haven, CT, USA*  
 Update on Live Image Guidance in Interventional Oncology



**Dr. Ruediger Scherthaner**  
*Medical University of Vienna, Austria*  
 Improved intraprocedural depiction of primary and secondary liver tumors: 3D HQ Imaging with Dual-Phase XperCT Open



**Dr. Karun Sharma**  
*Children's National Medical Center, Washington, DC, USA*  
 Seeing where you embolize – Visibility of a novel radiopaque bead during image guided interventions – an animal model



**Prof. Gianpaolo Carrafiello**  
*University of Insubria, Varese, Italy*  
 Novel approaches for Ablation and Embolization with ultrasound, Dual-Phase CBCT and OncoSuite

**PHILIPS**

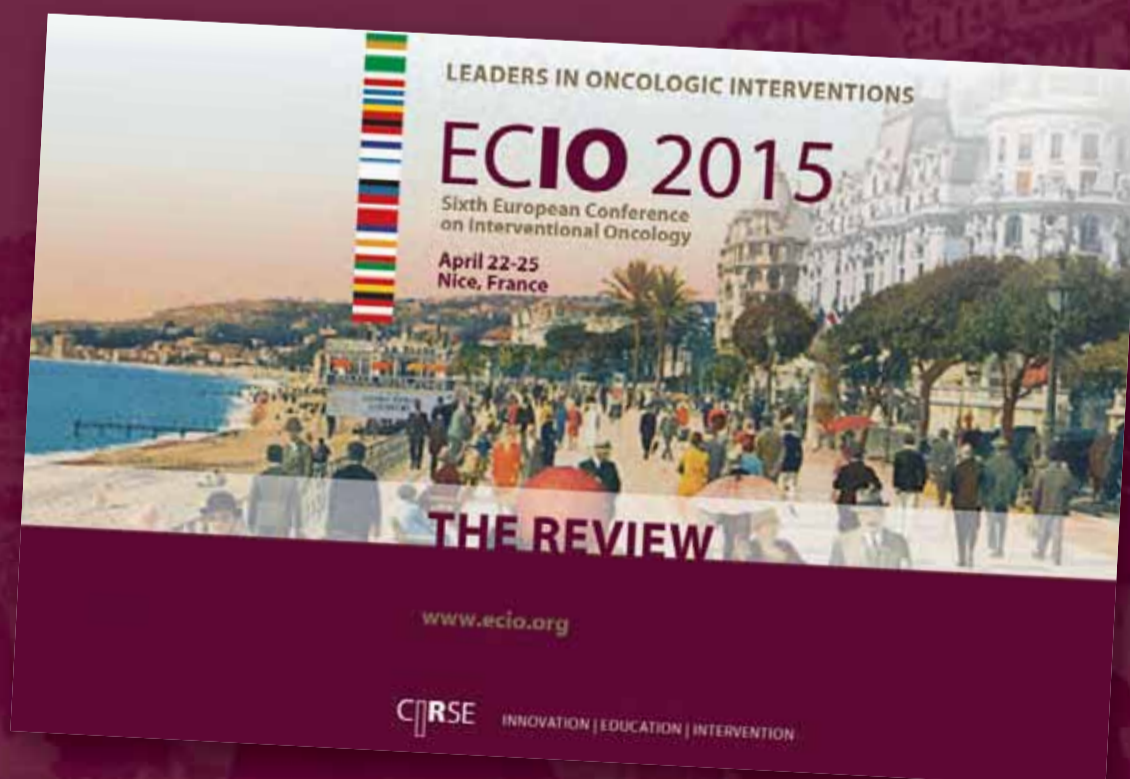
# ECIO 2015 – THE REVIEW

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## Transarterial management of colorectal liver metastases remains a challenge

Peter Huppert

Patients with liver metastases from colorectal cancer have a poor prognosis. Fewer than 25% are candidates for curative resection or percutaneous ablation, and of those who do, 70% will suffer from relapse within 3 years [1]. Systemic first-line 5-fluorouracil (5-FU) based treatments in combination with irinotecan or oxaliplatin and monoclonal antibodies offer response rates of 31-62%, median progression-free survival (PFS) of 6.9-10.6 months and median overall survival (OS) of 14-21.5 months [2-5]. However, in patients refractory to these treatments second- or third-line systemic treatments are far less effective with RR of 4-21% and median PFS of 2.5-4.8 months [6-8].

Despite several advantages of catheter-based treatments of liver tumours becoming apparent during the last decade, there is still no clear evidence that hepatic arterial infusion chemotherapy (HAIC), via ports or isolated hepatic perfusion (IHP), transarterial chemo-embolisation (TACE) and transarterial radio-embolisation (TARE) can improve OS and PFS, respectively, in patients with colorectal liver metastases when compared to systemic treatment (ST) or best supportive care. However, local response and conversion to resectability due to these treatments has been shown and this will probably be of benefit in salvage patients.

### Hepatic arterial infusion chemotherapy

In 2007 a systematic review including 10 RCTs concluded that HAIC does not provide a survival benefit in comparison to ST [9]. However subsequent trials showed that HAIC combined with ST after failure of first-line therapy may improve PFS to 4-7 months [10-12]. Conversion to resectability was achieved in 35-47% [11, 13].

### Isolated hepatic perfusion

IHP may improve local response in very select patients progressive after ST. Response rates up to 60-68% with PFS up to 12 months may be possible [14, 15].

### TACE

Since 1998 several trials evaluated conventional TACE in patients with metastases refractory to ST. In the majority of these studies, combinations of cisplatin, doxorubicin and mitomycin with particles of polyvinyl alcohol (PVA) or collagen for embolisation had been used, but with varying protocols. Reported objective

response rates of 2-63%, PFS of 3-8 months and OS of 8.6-14.3 months [16-20] demonstrated that outcomes after TACE appear to be highly variable and only limited data are available to determine which subgroups of patients will benefit from this treatment. Patients who had one or two lines of systemic treatment prior to TACE seem to have better outcome (median survival 11-12 months) compared to patients after 3-5 lines (median survival 6 months;  $p=0.03$ ) [20]. The presence of extrahepatic metastases had no clear impact on survival. Studies with larger numbers of patients reported objective response rates below 15% [19, 20] and studies including patients with advanced tumour involvement of the liver showed overall survival below 10 months after first TACE [16, 18, 20].

Drug-eluting microspheres provide controlled drug release to tumours, reduce systemic drug side effects and improve reproducibility of TACE. Irinotecan is a potent drug for treatment of colorectal cancer liver metastases with high total body clearance and high liver extraction rate favourable for transarterial liver treatments. Today, various types of microparticles are available for clinical use which are capable of being loaded with irinotecan. TACE using drug-eluting microparticles (DE-TACE) with irinotecan loaded into several types of microparticles had been evaluated in six retrospective studies and in one RCT comprising 215 patients [21-27]. If patients had pre-treatment by ST, local tumour control (no progression) was 40-86%; however PFS and OS was limited to 4-8.1 months and 5.4-13.3 months, respectively, after first DE-TACE. Using irinotecan-loaded microparticles during TACE, near complete devascularisation of colorectal liver metastases can be obtained in a substantial proportion of cases. In our study [25] using irinotecan-loaded HepaSphere™ microspheres, complete absence of tumour enhancement during CT was seen at three months in 7 of 29 patients and necrosis comprising  $\geq 50\%$  of tumour volume in 14 of 29 patients (Fig. 1). In patients with liver metastases, there is no standard in terms of selective versus non-selective application of drugs, embolics and microspheres.

For treatments of colorectal cancer metastases using irinotecan-loaded DC Beads, lobar injections were reported involving both lobes by

sequential sessions with time intervals of 3-8 weeks. Taking into account the disseminated nature of metastatic disease, lobar treatment during TACE seems to be mandatory. However, if pre-treatment imaging shows dominant large tumour involvement of a limited number of liver segments, transcatheter treatment offers the potential to enhance the treatment intensity by selective segmental injections prior to lobar injections. This technique of regional "boosting" TACE was performed in 30 of 74 treatment sessions in our study and was well tolerated without increase of side effects [25].

TARE was evaluated in seven trials comprising 1,174 patients, with data of 606 patients from a multicentre trial [28-34]. Most patients had ST prior to TARE. Local tumour control ranged between 29 and 73% depending on time interval and tumour volume. Overall survival was again limited to 6.2-11.6 months.

HAIC, IHP, TACE, DE-TACE and TARE are treatment options for patients with failure of one or more lines of standard palliative ST. The clinical results of these treatments are still limited and offer the chance of prolongation of PFS between 4 and 8 months depending on tumour load, performance status and extrahepatic tumour spread. The advantages of DE-TACE are a high level of standardisation and a low grade of complexity.

### Don't miss it!

Management of colorectal liver metastases  
Special Session  
Saturday, September 26, 11:30-12:30  
Auditorium 8



**Peter Huppert**  
Community Hospital  
Darmstadt  
Darmstadt, Germany

Dr. Huppert is an interventional radiologist who works at the Department of Radiology, Neuroradiology and Nuclear Medicine in the Community Hospital Darmstadt.

A specialist in radiology and neuroradiology, his clinical and scientific work is focused on oncology, peripheral vascular disease and portal hypertension. Prof. Huppert is a member of the board of the German Society of Interventional Radiology (DeGIR), and was recently elected as the President of the German Congress of Radiology 2018. The German Radiological Society (DRG) awarded him the Felix Wachsmann prize, which recognises outstanding contributions to continuing education efforts, in 2012.

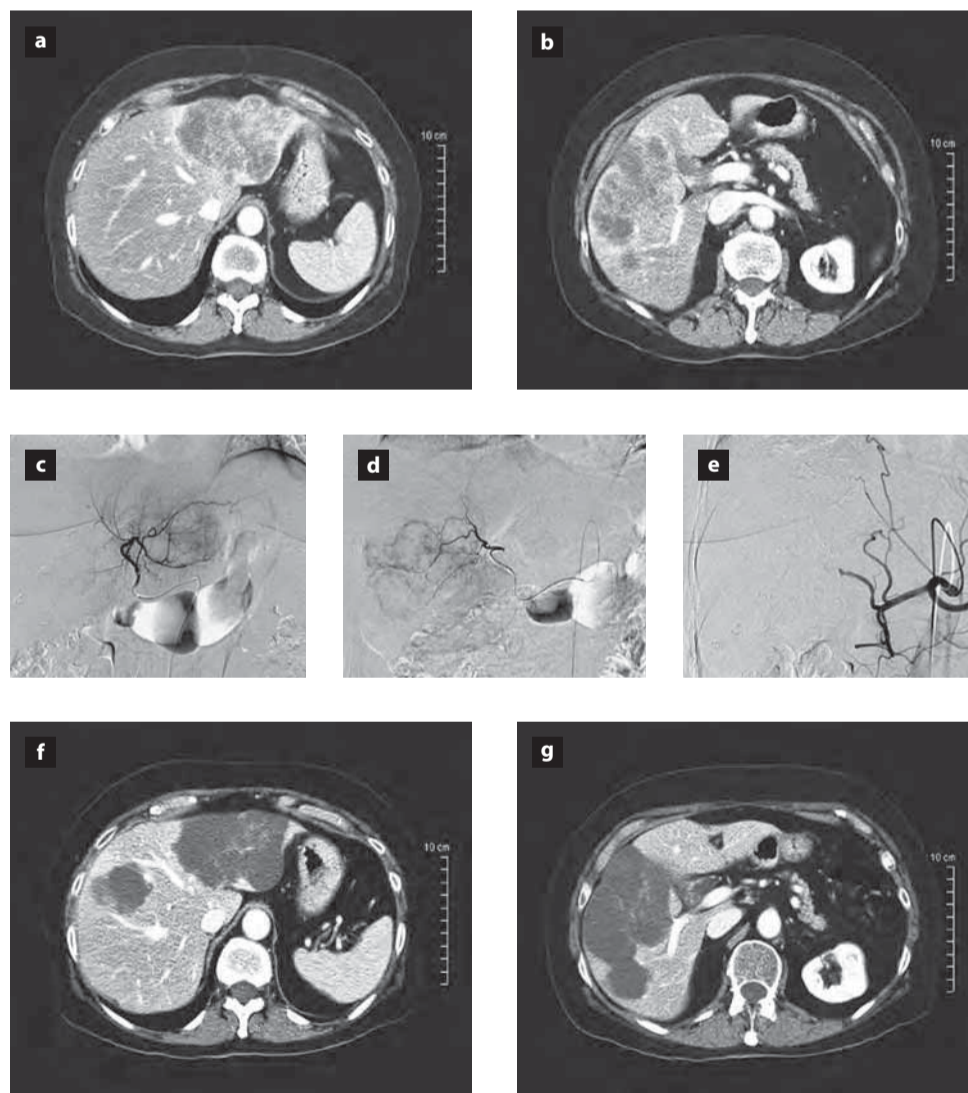


Figure 1: Bilobar metastatic disease occupying  $>50\%$  of liver volume (a, b). Tumours show moderate hypervascularisation during arterial phase of DSA (c, d). After TACE, complete arterial filling ("casing") is seen (e); after two rounds of TACE, complete tumour necrosis (f, g). Patients survived 12 months after first TACE with progression-free interval of 6 months.

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Join Us at CIRSE 2015

**A O R T I C**  
BY DESIGN

Sunday, 27 September 2015

**A Morning Symposium at The Interdisciplinary Endovascular Aortic Symposium (IDEAS)**

Location: **AUDITORIUM 2**  
Moderators: **Piergiorgio Cao, MD - Rome, IT**  
**Vincent Riambau, MD - Barcelona, ES**

08:00 - 08:10

**TREO: From Evidence to Clinical Practice**  
John P. Henretta, MD - Asheville, US

08.10 - 08.20

**Why a Custom Made Program of Treovance Abdominal Stent-Graft?**  
Christoph Engelke, MD - Goettingen, DE

**Presentation at Amazing Interventions session,**

16:15 - 17:15

Location: **AL 1409 - Amazing Interventions**

**A clinical case of branched arch thoracic stent-graft**  
Mo Hamady, MD - London, GB

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## Travel back in time – revisit 30 years of CIRSE!

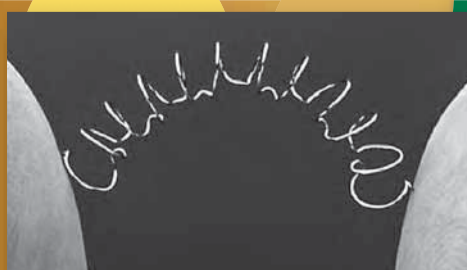
On April 24, 1985, CIRSE came into existence, following the merger of the two previously existing IR societies: the European College of Angiography and the European Society of Cardiovascular and Interventional Radiology.

Here in Lisbon we celebrate our 30th annual meeting, and we'd like you to travel back in time with us and explore the eventful years that have led to the success of today's CIRSE.

A specially created "30 years" website will guide you through the various chapters of CIRSE's history, outlining major milestones in its development.

This new website is available to view in a special "30 years of CIRSE" booth in Exhibition Hall 2. The booth features a special viewing screen, as well as offering scientific delegates some CIRSE-branded merchandise: each delegate can choose one t-shirt and one of a number of "goodies" (laptop sleeves, USB sticks, mouse pads).

So call by: take a tour of CIRSE's thirty year history, and pick up your complimentary CIRSE merchandise!





## Thermal Ablation of Varicose Veins

Levent Oguzkurt (EBIR)

Lower extremity varicose veins represent one of the most common vascular conditions in the adult population. The predominant causative factor of this condition is either retrograde reflux, in which reflux starts in the saphenous veins and extends to the tributaries, or antegrade reflux in which venous insufficiency starts in the small tributaries of the saphenous system and extends to the truncal vein. Patients with varicose veins may be asymptomatic, or may have symptoms such as pain, heaviness, tiredness, heat sensation, night cramps, itching over the varicose veins and paresthesias. Chronic venous insufficiency with skin changes, ankle swelling, pain and even ulceration of the leg can ensue in long-standing cases. These clinical complaints usually cause a decrease in the quality of life.

The traditional treatment was surgical high ligation and stripping of the incompetent saphenous vein. High ligation with stripping had a 25-60% failure rate, ranging from 5 to 34 years in the available literature. The failures associated with high ligation usually arise from neovascularisation in the saphenofemoral surgical bed. Incomplete removal of the saphenous vein has been reported to occur in as high as 62% of patients, as the stripper is passed blindly during the surgical procedure.

### Thermal ablation

Endovenous thermal ablation methods in the form of laser, radiofrequency or steam ablation have gained wide acceptance owing to their

management of varicose veins. The same operator examined the leg with Doppler ultrasonography, treated the patient under ultrasonography and usually did the follow-up Doppler ultrasonography. This improved our understanding of the normal venous anatomy, its variations and sometimes causes of failure. With better understanding of the anatomy and then physiology of the varicose veins, the non-surgical treatment could hopefully excel in the successful management of varicose veins.

Endovenous thermal ablation methods use target temperature for successful ablation. Temperature increase during laser ablation is fast with a high-peak temperature for a short time, where steam ablation and radiofrequency ablation have longer plateau phases and lower maximum temperatures. Tumescence anaesthesia with or without anaesthetic solution is always applied before any thermal ablation and is a very important step to protect the tissues surrounding the ablated vein, and to reduce complications during and after the ablation procedure.

### Available devices

Laser devices for use in the treatment of saphenous reflux are currently available from several manufacturers. The laser-emitting machines differ primarily in their power and wavelengths. The fibres differ on their tip shape and configuration (bare tip vs. jacketed tip and straight tip vs. radial tip). Although

differences, all thermal ablation methods with any parameter seem to have similar excellent anatomical and clinical outcomes.

### Outcomes

Most data on thermal ablation methods are almost exclusively single-centre data. These studies demonstrate a very high initial success rate with thermal ablation methods, in the 95-100% range, with patients demonstrating approximately 90% persistent occlusion of the saphenous vein after 24 months. The patterns of recurrence following thermal ablation of saphenous veins are different than those seen after surgery. Specifically, new reflux in other saphenous veins (especially anterior accessory vein) is responsible for most recurrent varicose veins and neovascularity seems to be very rare following endovenous thermal ablation. Clinical evaluation and overall quality-of-life scores improved in all patients compared with baseline. Symptomatic relief remains extremely high through the 5-year interval, with fewer than 5% of patients demonstrating return of the pain and fatigue symptoms with which they had presented.

Surgical techniques for controlling saphenous reflux, including ligation and even stripping of the saphenous vein, are morbid procedures. Endovenous techniques, by comparison, have low rates of complication. The use of ultrasound-guided tumescence anaesthesia has dramatically improved complication rates associated with the procedures. Thermal

### Don't miss it!

Venous Forum I: Varicose veins

Special Session

Saturday, September 26, 08:30-09:30

Auditorium 6



**Levent Oguzkurt**

(EBIR)

Medical Park Hospital Group  
Istanbul, Turkey

Following 15 years working at Baskent University, Prof. Oguzkurt transferred to the division of interventional radiology at Medical Park Hospital Group, Istanbul in 2014. He specialises in vascular interventions, including peripheral artery revascularisation, endovenous treatment of venous thrombosis and treatment of varicose veins, as well as varicocele and pelvic congestion. His other areas of expertise include oncologic interventions, hepatic portal venous interventions and uterine fibroid embolisation. He is a strong advocate of scientific publishing: not only has he authored over 110 peer-reviewed international and over 30 peer-reviewed national publications, he also teaches at nationwide meetings dedicated to the topic.

least as effective as surgery in the successful obliteration of saphenous vein insufficiency and management of patients' symptoms. They also offer improved complication rates for pain, paresthesia, infection and venous thromboembolism when compared with



Figures: Fig. 1a and b show anterior and lateral projection photos of a 46-year-old woman with varicose veins due to left great saphenous vein insufficiency. Photos taken six months after endovenous thermal ablation (Fig. 1c and d) of the left great saphenous vein shows absence of varicose veins.

high effectiveness in causing obliteration of the incompetent saphenous veins. Ultrasonography is used in every important step of these procedures. The advantages of thermal ablation therapies, including short hospital stays, less pain, less bruising and less post-operative recovery, placed these methods as the primary treatment option for varicose veins in the American and European guidelines. The minimally invasive nature of the treatment has obviated the need for surgery and led to greater acceptance by patients, which in turn has considerably increased the demand for endovenous thermal ablation procedures.

Endovenous laser ablation, when first introduced into clinical practice, brought together an additional improvement for the

the initial success rate and durability of laser treatment for saphenous reflux are very promising, we still do not know the best settings for power or energy delivered. Power of between 5 and 30 watts and energy delivery of between 40 and 120 J/cm are used with success. However, there is still no evidence with which to make any credible distinction among the various power, wavelengths and tip types or shapes in terms of efficacy. The differences with new long radiofrequency catheters are minor, as many settings are fixed by the manufacturer. Only ablation cycles can be increased at each segment, which was shown to be unnecessary in one study. For steam ablation, the device does not have mechanical differences and the only parameter that can be changed is pullback duration. With these

ablation methods can cause pain, bruising, tenderness and phlebitis over the treated vein. Neural damage to the saphenous nerve is rare but possible when one ablates the great saphenous vein distally. Deep vein thrombosis, pulmonary embolism are extremely rare but can be seen. Over the past five years, the incidence of adverse events reported for laser and radiofrequency ablations were 1 and 2 per 10,000 procedures, respectively. The complication ratio over the years was <1:2,500 for deep vein thrombosis, <1:10,000 for pulmonary embolism, <1:50,000 for death.

### Conclusion

Currently available clinical trial evidence suggests that thermal ablation methods are at

surgical treatment. The effectiveness of laser, radiofrequency and steam ablation are similar. Although some meta-analyses showed lower recurrence rates for laser ablation and improved post-operative pain with radiofrequency ablation among all thermal ablation methods, others showed similar effectiveness and complication rates.

Many operators now believe that endovenous thermal ablation methods meet the primary aim of high efficacy and low morbidity and will be defined as the new reference standard for the management of saphenous vein insufficiency.

## CIRSE 2015 Student Programme – be inspiRed!

The tremendously popular student programme is now in its sixth year and we heartily welcome all students to the congress! As a hub of research and innovation, CIRSE 2015 is the ideal place to find out more about the specialty and to address any queries about IR that students may have.

The CIRSE 2015 student programme is designed to showcase the unique aspects of IR as a specialty and a career path whilst also facilitating the answering of any questions students may have. The aim of the student programme is to provide a thorough introduction to IR and through this spark the interest of bright young minds who would otherwise be unaware of what the discipline has to offer.

The student programme gives students the opportunity to:

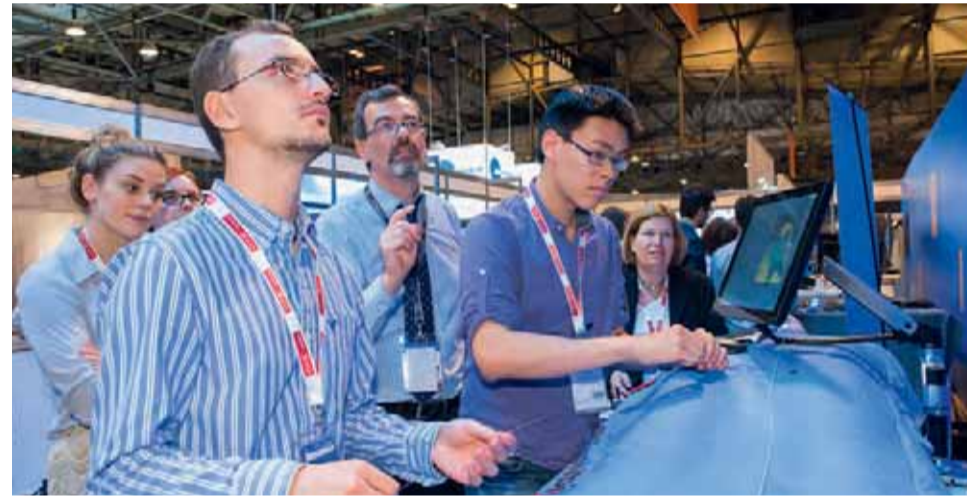
- get to know the world of interventional radiology
- learn from the most renowned doctors of the specialty
- experience the dynamic atmosphere of a professional medical congress
- explore new options for your professional future
- interact with like-minded students and doctors

The Introducing IR sessions consist of lectures and an interactive question-and-answer session with top interventional radiologists and are in both English and Portuguese, to make IR as accessible as possible. A number of hands-on simulator sessions have been arranged – due to limited numbers, only pre-registration is required.

The student programme also contains a range of courses and sessions which have been especially chosen as being well-suited for medical students and doctors at the beginning of their careers, and contains a variety of session types, including Foundation Courses, Special Sessions and Workshops. In addition to courses named in the student programme, medical students are welcome to attend all sessions at CIRSE 2015, apart from the Hands-on Workshops.

Students are also invited to come to the Student Lounge, where they can pick up their info-packs, write up their notes, meet like-minded peers, and get a complimentary lunch (12:00-14:00, vegetarian options available).

We wish the students a wonderful congress!



### Today's picks:

#### Basic principles of haemodialysis access maintenance

Auditorium 6  
10:00-11:00

#### Current evidence and indications for failing dialysis access management

*M.R. Sapoval (Paris/FR)*

#### Thrombosed dialysis access

*F.G. Irani (Singapore/SG)*

#### Treatment of central vein occlusions

*A.M. Madureira (Porto/PT)*

#### Non-maturation dialysis access

*S.O. Trerotola (Philadelphia, PA/US)*

#### CIRSE Opening and Awards Ceremony

Auditorium 1  
14:30-16:00

#### Introdução à Radiologia Intervencionista (Português)

Room 3.B  
17:30-18:30

#### Radiologia de Intervenção na perspectiva de um jovem especialista: a formação e futuro desta subespecialidade

*P.Lopes (Santarém/PT)*

#### Técnicas em Radiologia de Intervenção: Aplicações clínicas e casos práticos

*T. Pereira (Vila Nova de Gaia/PT)*

#### Os dispositivos médicos da Radiologia de Intervenção: visita guiada à exposição técnica

*F. Gomes (Faro/PT)*

#### Introducing IR (English)

Room 3.A  
17:30-18:30

#### Welcome from the President & general introduction to IR

*A.-M. Belli (London/UK)*

#### Summary of conditions / IR treatments

*E. Brountzos (Athens/GR)*

#### Education, training, IR as a career

*K.A. Hausegger (Klagenfurt/AT)*

#### Introduction to the congress

*C.A. Binkert (Winterthur/CH)*

#### Children's Cancer Charity Evening

Lisbon University Stadium  
19:00

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Satellite Symposium**

„Mechanical debulking in arteries and its importance in optimization of endovascular therapy?“

Sunday, September 27, 2015

13:00 - 14:00

Auditorium 2

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# CardioVascular and Interventional Radiology

The official journal of the Cardiovascular and Interventional Radiological Society of Europe

## Calling all CVIR Reviewers, Authors and Editorial Board Members!

In recognition of your valuable contribution to the journal, CVIR's Editor-in-Chief, Dierk Vorwerk would like to invite you to attend this year's

### CVIR Reception and Award Ceremony

Date: Saturday, 26th September, 2015

Time: 12:30 – 13:45

Location: Room "La Fenice",  
Vila Gale Opera Hotel



### NEW – CVIR Lounge and Terminals

Unable to make it to the ceremony? Why not stop by for a coffee at the CVIR Lounge or browse the journal at the special CVIR terminals? Both have been set up for your convenience!

## Today's Featured Paper

will be presented in the Free Paper session below, taking place from 16:15-17:15

FP 607 MRgFUS and IRE  
Room 3.A

**Magnetic resonance-guided focus ultrasound surgery (MRgFUS) compared to uterine artery embolization (UAE): main differences, advantages, therapeutic response, and definition of selection criteria**

F. Ferrari, A.V. Giordano, F. Arrigoni, S. Carducci, A. Miccoli, S. Mascaretti, G. Mascaretti, C. Masciocchi; L'Aquila/IT

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