CIRSE 2018 – Lisbon
Tuesday, September 25, 2018

Back to Barcelona

On our fourth and final day, it's time to start looking forward to our next meeting, which will once again be held in the cosmopolitan Catalonian city of Barcelona. As one of the most popular destinations in Europe, Barcelona offers the ideal infrastructure for large congresses, with excellent accommodation, seamless transport and many services catering for visitors, complementing the state-of-the-art congress centre that has hosted us in 2013 and 2016.

We hope CIRSE 2018 has helped bring you up to speed on the latest advances and trends in the field, and that you are motivated to join us next September for more scientific data and discourse! Play your part: abstract submission will be open from December to February – keep an eye open for announcements later this year! But first, make the most of your last day in Lisbon: there are dozens of excellent lectures today, and you can get a taste of what awaits you overleaf...

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Taking Stock of Complications at the Morbidity and Mortality Conference

Interview with Dr. Julien Garnon, Interventional Radiologist at Strasbourg University Hospital, France

For the first time at CIRSE, the Morbidity and Mortality Conference will take place on Tuesday afternoon, moderated by Prof. Thomas Jahnke and Dr. Julien Garnon. Back in June, we caught up with Dr. Garnon when he delivered his keynote lecture on managing anticoagulation therapies at ICCIR 2018. Since 2010, physicians have been meeting every two years in Pörtschach, Austria to discuss interventional radiological procedures that did not go as planned. Taking stock of complications and failures in any medical field is important, even more so in a fast-growing field such as interventional radiology. Honing techniques and improving patient management are vital to upholding a high standard of care. A wide range of cases from the fantastic faculty were presented at ICCIR 2018, providing a springboard for many laudable discussions.

CIRSE: What are the main factors to consider when employing anticoagulation?

Garnon: It really depends on the type of procedure you are about to do. A bleeding risk is not the same between a superficial biopsy and kidney ablation so you have to take this into account. The other point is to evaluate the thromboembolic risk when you stop the anticoagulation therapies. These are the key features when managing anticoagulant therapies around an intervention. The issue is that many IRs are not well aware of anticoagulation therapies, which was actually my case before preparing this talk. After studying which therapies are available in preparation for this lecture, I now feel more comfortable managing them.

CIRSE: Can you tell us a bit about your keynote lecture?

Garnon: I spoke about when to stop anticoagulation, when to resume it and also which medications require switching to another anticoagulation therapy. There are three major classes of medications: the anti-vitamin K, which limits the production of clotting factors; the second class is represented by the heparins group, with the unfractionated heparin and the low-molecular-weight heparin; the third class is direct anticoagulation, which was released in 2008.

CIRSE: Would you say that the risk associated with using anticoagulation therapies in a peri-operative setting has decreased over the past ten years?

Garnon: Very hard to tell. I don't think there is any evidence for that in the literature, especially for radiological interventions. There are a couple of specific IR papers dealing with that topic, but data is still limited so I cannot answer definitively. This topic actually outlines the critical role of the interventional radiologist who has to chase any anomaly that might result in an increased bleeding risk during or after the procedure – that's particularly important with the new oral anticoagulants which cannot be biologically traced.

CIRSE: What do you believe the role of the IR is in management of anticoagulation therapy?

Garnon: One point is that most of the time it is another practitioner who prescribes the anticoagulation so our role is more based around when to stop, when to switch and when to resume. You cannot learn all the medication by heart but you should at least be able to identify a risky situation. IRs should have a better overview, they should know the basic medications, the basic rules of the management of these medications and each time you don't know or it's really a specific situation, for example, a patient with a high bleeding risk procedure and a patient that has a mechanical valve who is at high risk of thromboembolic event, you should consult a colleague who is specialised in that area.

CIRSE: What are the main benefits of coming to ICCIR? Any highlights for you?

Garnon: Aside from the amazing lake, it's really interesting to see so many different types of complications. I also have to say it's brave of the speakers to share the complications because it is never easy! You want to share the good cases and it's more difficult to share bad experiences. But, you learn more from complications than from good cases. I've enjoyed seeing everything that is in my field of expertise, which is non-vascular interventions, but I was also interested in attending vascular complications as this would help me if I go into this area.

CIRSE: How do you deal with complications in your team?

Garnon: First of all, you have to assess if the complication is life-threatening and requires specific treatment. Seeking advice or help from a colleague is usually the best way to manage a complication in the case of adverse events. Furthermore, it is really important to follow up on the patient as their doctor. For example, if nerve palsy occurs during a bone ablation, there is not much you can do but you should take the time to explain the situation to the patient.

We hope to see you in Auditorium 1 at 15:00!

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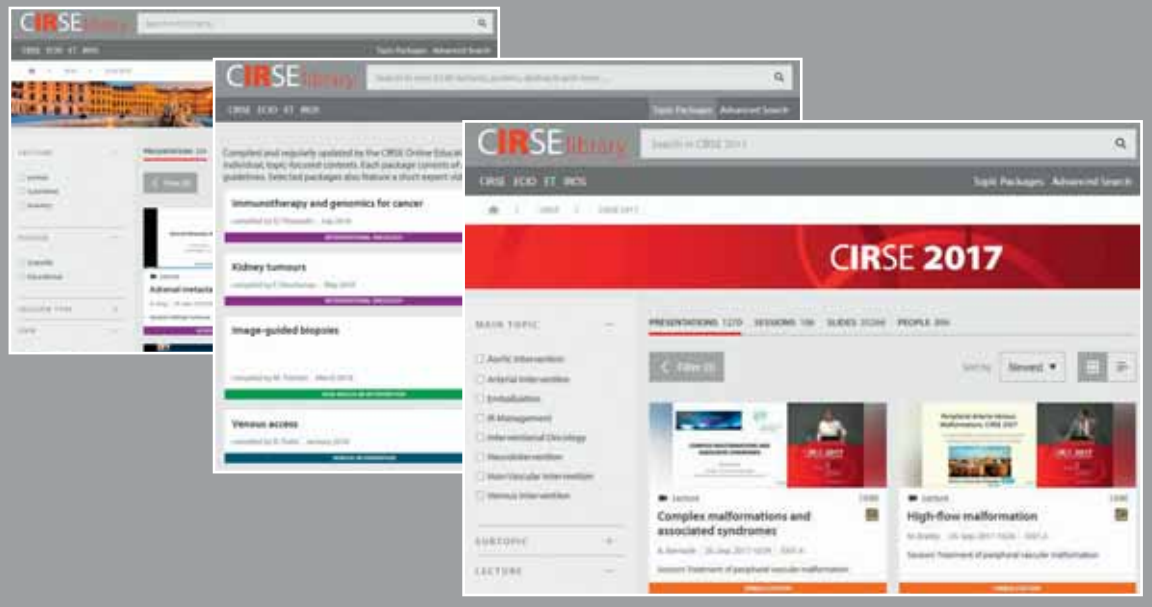

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Endovascular embolectomy for acute ischaemic stroke: an update

Antonin Krajina, EBIR

Don't miss it !
Josef Roesch Lecture
Tuesday, September 25, 14:30-15:00
Auditorium 1

Antonin Krajina
(EBIR)
University Hospital of Hradec Králové
Hradec Králové,
Czech Republic

Prof. Antonin Krajina is an IR at the University Hospital of Hradec Králové in the Czech Republic, where he received his medical degree. He completed his IR fellowship at the Oregon Health Sciences University, in Portland under Prof. Josef Rösch, Prof. Frederick S. Keller, and Dr. Stanley Barnwell. His research and clinical career have encompassed many vascular procedures and devices, particularly portosystemic shunts, balloon and stent angioplasty, AAA stent grafts, intra-arterial infusions and neurointerventions. Prof. Krajina has held CIRSE Fellowship since 1999, and has served as a member of the editorial board as well as a reviewer for CVIR, JVIR, European Journal of Radiology and others. Previously, he was also a member of the CIRSE Stroke Therapy Task Force.

Stroke is the leading cause of disability, and due to intensive care, it has dropped to the fourth leading cause of death in 2008. This was the result of improved cardiovascular risk prevention, better care during the first few hours of acute stroke, and also public awareness of the possibility to be treated successfully in the acute stage.

The history of stroke therapy goes back to the 1950s. The first reported recanalisation after intravenous plasmin infusion and angiographically documented intracranial recanalisation was published by Sussman et al. in 1958 [1]. Endovascular therapy of acute ischaemic stroke with an intra-arterial infusion of thrombolytics was started by a pioneer of this therapy, Hermann Zeumer, in 1978. His strategy of invasive stroke therapy was based on an existing therapeutic window due to delayed deterioration of patients with acute stroke [2]. Twenty years later, the first randomised study comparing results of local intra-arterial fibrinolytic infusion with placebo was published [3]. This study revealed 9% benefit in patients with modified Rankin scale (mRS) 0–1 when local fibrinolytics were infused as close to the clot as possible over placebo. However, later experience showed that embolus volume limits the efficacy of thrombolytic therapy even if it is administered locally with a high concentration of fibrinolytics.

Intra-arterial mechanical clot disruption using microcatheters and wires in combination with intra-arterial thrombolysis was described by Stanley Barnwell and colleagues in 1994 [4].

The turning point came with a case report by Chopko et al. [5] demonstrating successful clot removal using an intra-arterial snare; this probably initiated development of dedicated devices for intra-arterial blood clot extraction. The first such system was introduced in 2004 (Mechanical Embolus Removal in Cerebral Ischemia – MERCI) [6] and, simultaneously, the Penumbra system [7]. The principle of the first was based on mechanical atraumatic removal of the clot while the blood flow was stopped; the second one was based on aspiration of the disrupted clot.

Both these systems were replaced with a stent retriever, whose construction was based on retrievable, detachable intracranial stents [8]. The design of the self-expandable intracranial stent enabled deployment of this stent into the clot, which was then entrapped by it. The non-detached stent was slowly removed under aspiration through the guiding balloon-tipped catheter previously developed for the MERCI retriever.

When this device, together with improved logistics of patients, was evaluated by randomised studies, the benefit over intravenous thrombolysis was definitively proved in 2015 [9]. There have been several studies proving significant superiority of mechanical thrombectomy over intravenous thrombolysis in occlusion of the internal carotid artery and M1, while benefit to the other distal and posterior territories has not yet been proved by randomised studies. The extent of benefit in these studies was dependent on the selection criteria for inclusion of patients.

The attention of investigators has turned to patients coming more than 6 hours after onset of symptoms. Here, it has been seen that individual collateral flow keeps the therapeutic window open beyond 6 hours based on imaging criteria. Two recently published trials showed that in patients who are selected using CT perfusion or diffusion-weighted imaging, thrombectomy significantly improves outcomes, even up to 24 hours from onset. Whether patients showing large infarction on CT (ASPECTS 3-5) can be helped by recanalisation will be evaluated in the near future too.

The AHA/ASA's 2018 Guidelines for the Early Management of Patients with Acute Ischemic Stroke [10] recommended patient transfer to comprehensive stroke centres where thrombectomy can be performed. These centres should provide parenchymal CT imaging and CT arteriography (CTA). These two modalities provide sufficient information to determine eligibility for endovascular treatment in the first 6 hours from stroke onset. CTA should be performed without waiting for a serum creatinine level [10]. Physicians performing endovascular therapy of stroke must be properly trained in clinical neuroscience, neuroimaging and neurointerventions [11].

Successful endovascular stroke therapy reduces the number of patients who will be dependent on care, or live in nursing homes. This will lead to significant cost savings in social care budgets across Europe, rendering the treatment highly cost-effective [12]. The success rate of this therapy depends on its organisation, which includes the rapid transport of patients, fast clinical and diagnostic evaluation, quick decisions and the availability of a trained interventional team.

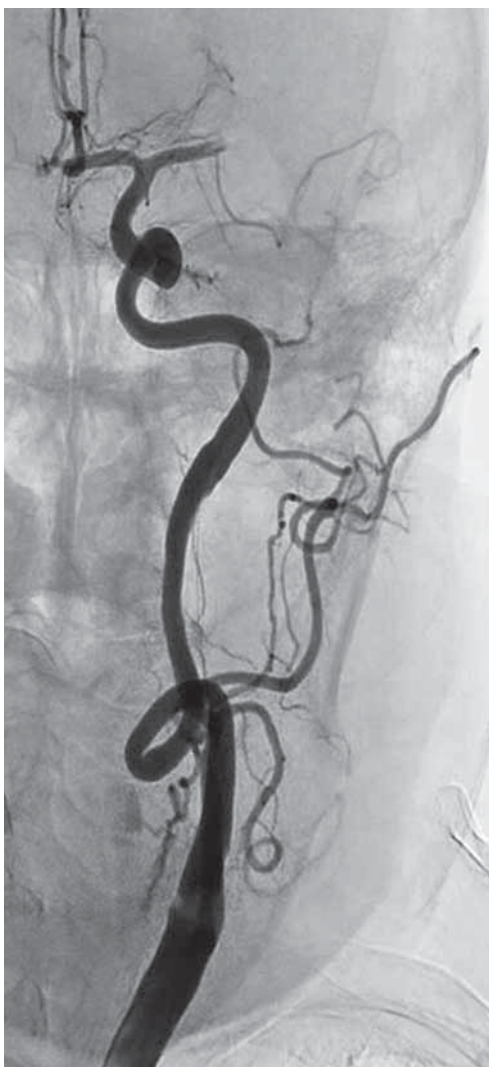

Fig. 1: Embolic occlusion of M1 segment of the left middle cerebral artery.

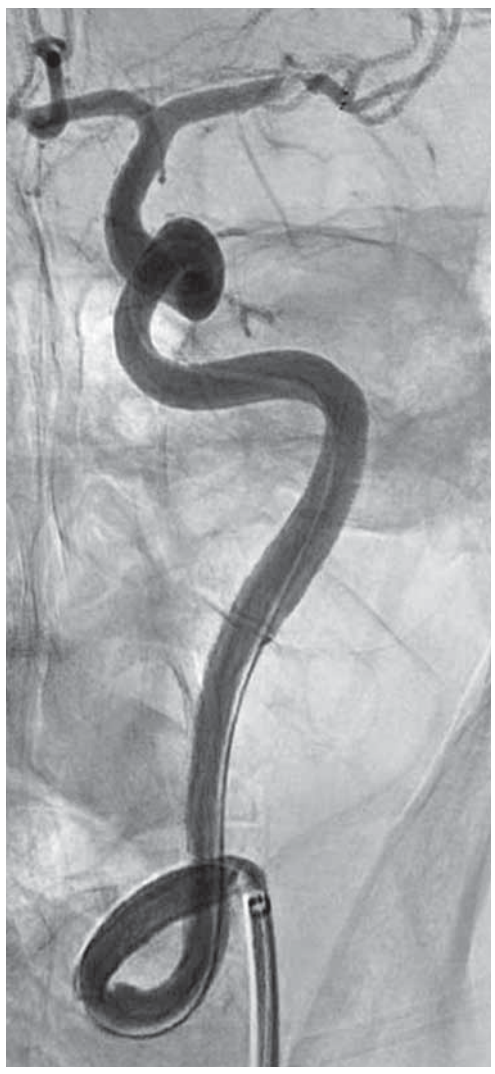

Fig. 2: The internal carotid artery was catheterised with a microcatheter and a non-detached stent was deployed across the occluded segment of the middle cerebral artery. Partial flow was already seen on this angiogram.

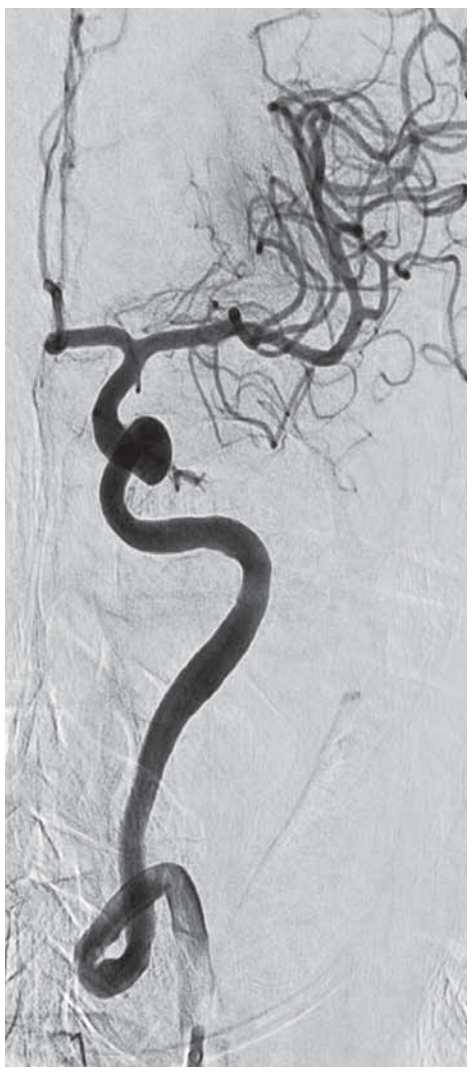

Fig. 3: Completion angiogram revealed full recanalisation of the middle cerebral artery. The patient´s right-sided hemiparesis and aphasia recovered a day later.

Fig. 4: The stent-retriever after removal with clot entrapped among its struts.

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Subclassification of advanced stage HCC: a proposal

Irene Bargellini

Don't miss it !
Advanced stage HCC and beyond: unsolved questions
Focus Session
Tuesday, September 25, 11:30-12:30
Room 5.A

Irene Bargellini
University Hospital of Pisa
Pisa, Italy

Dr. Bargellini is a consultant interventional radiologist at the University of Pisa, Italy, where she graduated from Medical School in 1999, and in 2003, became board-certified in radiology. From 2003, Dr. Bargellini worked in the Department of Diagnostic and Interventional Radiology, and from 2011 onwards she led the Interventional Oncology Programme, again at the same institution. She is a reviewer of several journals, including the European Journal of Radiology, Cardiovascular and Interventional Radiology, and Insights into Imaging.
Dr. Bargellini is also a Fellow of the European Society of Gastrointestinal and Abdominal Radiology (ESGAR) and a Member of the Italian Society of Radiology (SIRM) and CIRSE. She is the author and a co-author of several papers and book chapters, mainly in the field of vascular and interventional radiology as well as IO.

Despite the extensive implementation of surveillance programmes, up to 55% of at-risk patients are still diagnosed with hepatocellular carcinoma (HCC) at an advanced stage of the disease, when curative treatments are no longer indicated and the median expected overall survival (OS) is approximately one year [1].

According to the Barcelona Clinic of Liver Cancer (BCLC) staging system, the advanced-stage HCC (BCLC-C) includes patients with preserved liver function (Child-Pugh Class A or B7), ECOG performance status (PS) 1 or 2, macrovascular invasion (MVI), and/or extra-hepatic tumour spread (EHS). The standard of care for this stage is represented by systemic therapies, i.e. sorafenib in the first line and, more recently, regorafenib as a second-line treatment [2].

Has survival of advanced-stage HCC patients improved in the sorafenib era?

A recent retrospective analysis collecting over 50,000 HCC patients from the SEER database compared survival rates between pre-sorafenib (2001–2007) and post-sorafenib (2008–2013) eras, showing survival improvement only in early- and intermediate-stage HCC patients, with no significant variations in OS in HCC patients with macrovascular invasion and/or metastasis since the approval of sorafenib [3].

This finding, confirmed also by previous studies, emphasises the need for further research in the attempt to identify better therapeutic options for advanced-stage HCC.

However, while research is ongoing regarding newer first- and second-line systemic therapies (such as lenvatinib, cabozantinib and nivolumab), few efforts are being undertaken to assess the role of surgical options or liver-directed therapies, at least in selected advanced-stage patients.

Is a better patient stratification needed in the advanced stage? The case of Y90-radioembolisation

Recent large prospective randomised studies comparing sorafenib versus transarterial Y90-radioembolisation (RE) have failed to demonstrate any survival advantage of RE in the intermediate- and advanced-stage population [4, 5]. However, the results of these studies did not reproduce the survival reported in several published clinical experiences. The SARAH and SIRVENIB studies reported median OS after RE of 8 and 8.8 months [4, 5], respectively, which are lower than the median OS of 12-15 months reported in the European registry [6] and in large single-centre experiences [7].

One of the explanations for these differences is related to the unselected population of the large randomised studies, in which several inexperienced centres participated. Over the years, the clinical experience gained has prompted several centres to apply specific selection criteria in advanced-stage HCC patients who are deemed to benefit from RE [8, 9].

Therefore, a better classification is urgently needed to identify subclasses of BCLC-C patients who could benefit from surgical or loco-regional treatments.

What could differentiate advanced-stage HCC patients?

An analysis of the ITA.LI.CA database has shown that BCLC-C patients have markedly different prognosis according to the cause that determined the allocation to this stage [10]. Specifically, the median OS was significantly higher in PS 1 patients (38.6 months), compared to PS 2 patients (22.3 months). Prognosis declined in patients with extrahepatic disease (11.2 months) and MVI (8.2 months), and reached the lowest median OS (3.1 months) in patients with both metastasis and MVI. These findings suggest the need to differentiate these patients in order to promote more aggressive approaches in select situations.

Performance status

The definition of ECOG PS 1 includes patients who are "restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature". In clinical practice it can be extremely difficult to determine whether these physical restrictions are tumour-related (as required according to EASL guidelines), particularly considering the ageing HCC population. In fact, over the years the mean age of HCC patients has steadily increased, together with their co-morbidities.

As a matter of fact, several studies have reported favourable prognoses in patients who are classified as BCLC-C only by PS 1.

Hsu et al. have proposed to reallocate patients who are classified as PS 1 without MVI or EHS into BCLC-B (intermediate stage) [11] and, in 2013, the Italian Association for the Study of the Liver (AISF) position paper clearly stated that the presence of PS 1 should no longer be accepted as sufficient criterion for allocating patients to the advanced stage [12].

Macrovascular invasion

The extent of MVI has an impact on survival. Studies reporting clinical outcomes after loco-regional therapies, such as Y90-radioembolisation, have shown that overall survival is significantly better for patients with portal vein tumour thrombosis (PVTT) limited to segmental/subsegmental/lobar branches, compared with patients with MVI that extends into the main portal vein [6, 9].

The recently updated Asia-Pacific clinical practice guidelines underline that the sole presence of MVI does not represent a sufficient criterion to consider the patient unsuitable for potentially curative treatments, such as resection, or loco-regional approaches, such as TACE [13]. Accordingly, several groups have introduced the concept of "locally advanced" HCC, initially proposed by the Hong Kong Liver Cancer (HKLC) staging system, essentially defined by the presence of intra-hepatic MVI without EHS [14]. In the proposed subclassification of intermediate-stage HCC, Bolondi et al. [15] introduced a substage beyond B4, called "quasi C", which includes Child-Pugh A, PS0 patients with peripheral (subsegmental or segmental) portal vein tumour thrombosis for whom TACE or TARE could also be considered as alternative treatment options to sorafenib. The ITA.LI.CA study group has proposed a new tumour staging system, in which the presence of intrahepatic MVI alone has to be considered as a sort of intermediate-advanced stage, named B3, whereas the patient will be considered advanced (stage C) in the presence of extrahepatic MVI and EHS [16].

Extrahepatic tumour spread

As for MVI, location and extent of EHS may have a different impact on survival [17]. In the study by Hasegawa et al. [18], patients with pathologically proven regional lymph node invasion (any T, N1, M0) had a survival similar to that of patients with advanced T stage (T4, N0, M0), while those with distant metastases (any T, any N, M1) had a significantly shorter survival.

Moreover, potentially curative approaches have been proposed in selected patients with limited metastases amenable to RO resection and/or complete response after percutaneous ablation, such as subcutaneous, adrenal or lung metastases.

Subclassification of advanced-stage HCC: a proposal

On the basis of the available literature, a subclassification of advanced-stage HCC could be proposed:

	Features	BCLC Stage	Treatment options
PS1	No MVI, No EHS	A or B	Based on tumour extension
PS 0-1 Child-Pugh A	Peripheral MVI – No EHS	C1a	Y90-RE Resection TACE
PS 0-1 Child-Pugh A	Central MVI – No EHS	C1b	Systemic therapy Y90-RE + systemic therapy
PS 0-1 Child-Pugh A	EHS (± MVI)	C2	Systemic therapy*
P2	± EHS ± MVI	C3	Based on tumour extension and clinical assessment

** Consider surgery or ablation in select limited metastases for whom RO resection or complete ablation can be achieved.*

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Don't miss it !
IR for surgical disasters
Case-based Discussion
Tuesday, September 25, 11:30-12:30
Auditorium 8

Pylorus preserving pancreaticoduodenectomy

Otto M. van Delden, EBIR

Otto M. van Delden
(EBIR)
Academic Medical Center Amsterdam, The Netherlands

Prof. Otto van Delden is the Professor of Interventional Radiology at the Academic Medical Center (AMC) of the University of Amsterdam in The Netherlands, where he completed his radiology training and started as an IR in 1998. He has authored and co-authored over 120 papers in peer-reviewed journals. Prof. van Delden has been a Member of the Executive Committee of CIRSE since 2015, as well as a Director of the AMC Radiology Residency Program from 2005 to 2015 and a President of the Dutch Society of Interventional Radiology (DSIR) from 2010 to 2017. He is currently Chairperson of the EBIR Committee and the Local Host Committee Chairperson for ECIO 2019.

Pancreaticoduodenectomy or Whipple's procedure is a major abdominal operation most often performed to resect peri-ampullary tumours (carcinoma of the pancreatic head, distal cholangiocarcinoma or carcinoma of Vater's ampulla).

The original Whipple's procedure involves resection of the pancreatic head, gallbladder and distal part of the bile duct, the distal part of the stomach and the duodenum, and creation of a hepaticojejunostomy (HJ), a pancreaticojejunostomy (PJ), a gastrojejunostomy (GJ) and a Roux-Y reconstruction with a jejunojejunostomy (JJ). The procedure most commonly performed nowadays is called pyloris-preserving pancreaticoduodenectomy (PPPD), and in this operation the stomach is left in situ.

The operation is associated with a low mortality (<5%) in experienced high-volume centres, but has a high incidence of complications (50%), even in experienced centres [1]. Complications include the common post-operative sequelae such as wound infection and pneumonia. Specific complications of PPPD include leakage of any of the anastomoses, leading to bile leakage, biloma, intra-abdominal abscess, liver abscess, pancreatic fistula and delayed intra-abdominal haemorrhage.

Some of these complications may be imaged with ultrasound, but CT is usually required to better assess the post-operative abdomen. A single-phase study with IV and oral contrast suffices in most cases, but in case of haemorrhagic complications, a multi-phase study including arterial and portal or delayed-phase imaging has definite added value.

Most complications can be treated by interventional radiology and only a minority of complications require repeat laparotomy. In centres which perform PPPD, the presence of a 24/7 IR-service is absolutely required, as some of the complications require immediate treatment.

Intra-abdominal abscess, liver abscess and biloma are treated with percutaneous drainage. The approach for drainage can be difficult, as collections may be situated in between bowel loops, deep within the pelvis or in a subphrenic location.

Biliary leakage, most often from the HJ, has a relatively low incidence of 4% in one very large series and can be well treated with percutaneous transhepatic biliary drainage (PTBD) [1]. PTBD both treats the leakage and prevents future stricture formation at the HJ. PTBD may also be useful for treating leakage of the blind-ending jejunal loop, which is usually situated close to the HJ. PTBD can be very challenging, because bile duct dilatation is usually absent in the presence of bile leakage.

Leakage of the PJ and pancreatic fistula is a relatively frequent complication, occurring in 15% in the aforementioned series, and is treated with percutaneous drainage of the peri-pancreatic fluid collections [1]. It is essential to position the drainage catheter(s) as close to the PJ as possible. If PJ-leakage cannot be controlled by percutaneous drainage, repeat laparotomy is required, which usually involves resection of the pancreatic remnant leading to exocrine insufficiency of the pancreas and brittle diabetes. To prevent this, the current strategy advises early and aggressive percutaneous drainage when pancreatic fistula is suspected.

Delayed haemorrhage is a relatively infrequent, but particularly feared complication with a high mortality (30%), occurring in 4% of cases, and can be treated by transcatheter embolisation [1]. A typical location for delayed haemorrhage is the stump of the ligated gastroduodenal artery, which is transsected during removal of the pancreatic head. Treatment usually consists of embolisation of the proper hepatic artery with coils, but the presence of favourable anatomy may allow for placement of a stent graft. Other vessels, such as side-branches of the superior mesenteric artery, may also be involved. Massive life-threatening haemorrhage is often preceded by a minor warning bleed. This so-called "sentinel bleed" should trigger prompt intervention. Delayed intra-abdominal haemorrhage is usually the result of ongoing infection, e.g. in the presence of pancreatic fistula. Therefore, optimal and aggressive drainage of pancreatic fistula helps prevent the development of delayed intra-abdominal haemorrhage.

In case of a pre-operatively unrecognised stenosis or occlusion of the celiac axis, peri-operative transsection and ligation of the gastroduodenal artery can lead to ischaemia of the liver and bile ducts, which can in some cases be treated with percutaneous dilatation or recanalisation of the celiac axis. With proper pre-operative work-up, this complication should be very rare.

In summary, in the last two decades there has been an increasing trend towards non-operative treatment of complications of Whipple's procedure and PPPD, and early and aggressive IR-management has been able to prevent repeat laparotomy in most cases, keeping the mortality of this major surgical procedure well below 5% [1].

For optimal IR-treatment of complications of PPPD, proper knowledge of the post-operative anatomy and good communication with the referring surgeon (preferably the surgeon who performed the operation), as well as extensive experience with percutaneous drainage and embolisation techniques are essential.

References:
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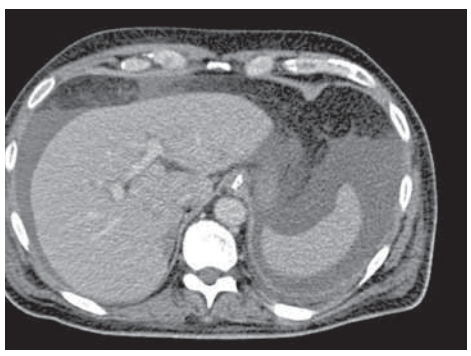

Fig. 1a: CT-scan 5 days post-PPPD showing intra-abdominal biloma as a result of HJ leakage.

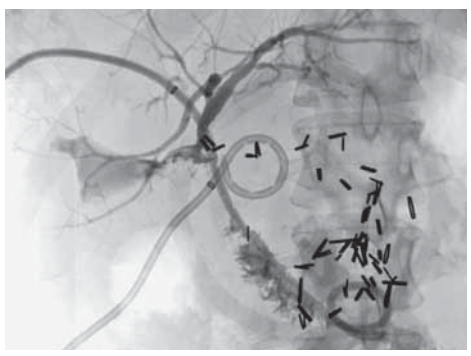

Fig. 1b: The biloma was drained percutaneously, and PTCD performed the next day shows leakage at the site of the HJ.

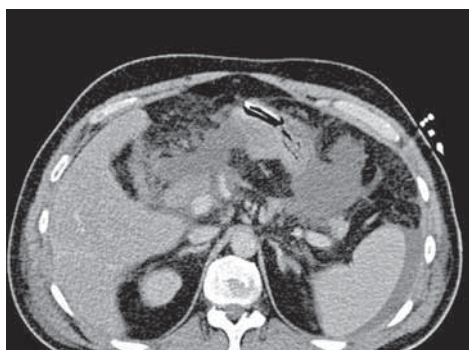

Fig. 2a: CT-scan performed 7 days after PPPD shows fluid collections suspicious for pancreatic fistula.

Fig. 2b: Contrast injection into a percutaneous catheter placed as close as possible to the PJ confirms pancreatic fistula. Also note biliary drainage catheter placed earlier to treat HJ-leakage.

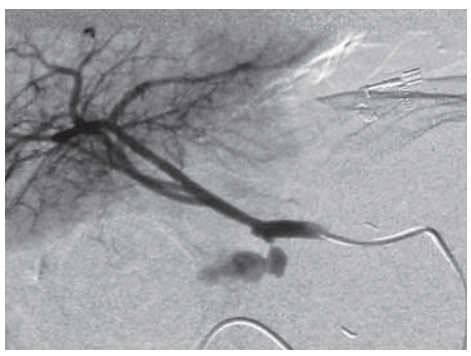

Fig. 3a: Selective angiogram performed 10 days after PPPD in patient with pancreatic fistula shows bleeding from gastroduodenal artery stump.

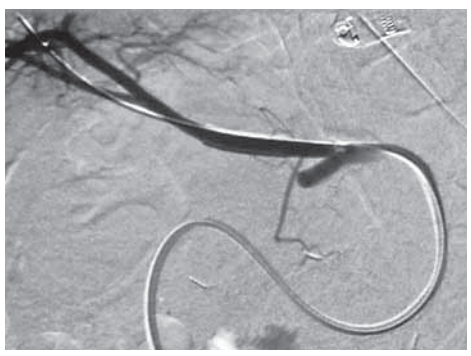

Fig. 3b: Selective angiogram performed after insertion of a covered stent at the site of the bleeding shows cessation of the bleeding.

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[1] The LUTONIX® AV Clinical Trial was a prospective, multicenter, controlled study comparing the LUTONIX® 035 AV drug-coated balloon (DCB) to standard PTA for the treatment of dysfunctional AV fistulae. The study enrolled 285 patients (DCB: 141, PTA: 144) at 23 investigational sites in the U.S. from June 2015 to March 2016. The primary safety endpoint, freedom from serious adverse events involving the AV access circuit through 30 days, was 94.2% for the DCB group and 95.8% for the PTA group (proportional based analysis) while the primary efficacy endpoint, target lesion primary patency (TLPP) through 6 months, was 71.4% for the DCB group and 63% for the PTA group (Kaplan-Meier analysis at 180 days). Interim data, site reported, subject to change.

[2] LUTONIX® AV Clinical Trial data on file. N=285. At 6 months, treatment with LUTONIX® 035 DCB resulted in a primary patency rate of 71.4% versus 63.0% with PTA alone. Primary patency defined as ending with a clinically driven re-intervention of the target lesion or access thrombosis. The primary effectiveness analysis for superiority of DCB vs. PTA was not met with a one sided p-value of p = 0.0562. Number of interventions required to maintain TLP at 24 months were 195 in DCB arm versus 211 in the PTA arm. At 30 days, treatment with LUTONIX® 035 resulted in a freedom from primary safety event rate of 95.0% versus 95.8% with PTA alone. Primary safety defined as freedom from localized or systemic serious adverse events through 30 days that reasonably suggests the involvement of the AV access circuit. The primary safety endpoint for non-inferiority for DCB vs. PTA was met with one-sided p-value of p = 0.0019. Percentages reported are derived from Kaplan-Meier analyses.

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Don't miss it !
CIRSE meets SOBRICE
Tuesday, September 25, 11:30-12:30
Room 3.A

Does vascular lake phenomenon indicate improved tumour response in DEB-TACE for HCC?

Rafael N. Cavalcante

Rafael N. Cavalcante
Clínica Vascular Angiomed
São Paulo, Brazil

Dr. Rafael Noronha Cavalcante holds a degree in medicine from the Federal University of Pará in Pará, Brazil. He also studied at the University of Santo Amaro and undertook a residency of Vascular Surgery at the Faculdade de Medicina do ABC. Dr. Cavalcante holds a Doctorate in Health Sciences from the Hospital Israelita Albert Einstein, as well as a certification in vascular surgery from the Brazilian Society of Angiology and Vascular Surgery (SBACV). He is a member of CIRSE and the Scientific Director of the Brazilian Society of Interventional Radiology and Endovascular Surgery (SOBRICE). Dr. Cavalcante is also an author of more than two dozen scientific papers, as well as several chapters of various books. Additionally, he is an assistant physician in the Department of Interventional Radiology and Endovascular Surgery at Hospital das Clínicas, USP (HC-FMUSP).

Drug-eluting bead transarterial chemoembolisation (DEB-TACE) is a well-established treatment for HCC patients in the intermediate stage of the Barcelona Clinic Liver Cancer (BCLC) staging system [1]. It is also widely used in the context of liver transplantation in two situations: first, as a bridging strategy for patients within the Milan Criteria to prevent drop-out from the waiting list, and secondly, as a down-staging method, allowing the potential candidates who at first did not meet the Milan Criteria to be subsequently listed after reduction of the tumour burden [2, 3].

During DEB-TACE for HCC, a localised pooling of the contrast medium is sometimes observed, resembling extravasation within the tumour. This angiographic finding is known as the "vascular lake phenomenon" (VLP) or "pooling phenomenon". The incidence, causes and clinical relevance of VLP remain a topic of debate, due to the paucity of studies on the literature focused on this finding.

At CIRSE 2013, Crespi et al. presented their retrospective results and outcomes of HCC patients that presented with VLP during DEB-TACE. Among their 289 patients treated with DC-beads measuring 100-200 µm, VLP was observed in 14.2% of cases. The authors found a lower mean overall survival in the group of VLP patients when compared to previous data reported in the literature; however, they did not have a non-VLP control group for an adequate comparison [4].

Two years later, Seki et al. published a retrospective study evaluating the effect of VLP on local response to DEB-TACE using Hepasphere 50-100 µm in a dry state. They reported VLP in 26% of the nodules treated, occurring more frequently in large tumours and when higher doses of microsphere were used. In their evaluation of nodule-based response to DEB-TACE based on mRECIST criteria, the authors observed significantly higher objective response rates in the VLP groups than in the non-VLP group [5].

Recently, our group has published a prospective study aiming to evaluate incidence and predictive factors for VLP, as well as to determine local and overall tumour response rates in patients who presented with VLP during DEB-TACE for HCC in comparison to patients who did not present the finding [6].

VLP was found in 12.1% of the 323 nodules treated. Tumour size ≥3 cm in diameter (OR 13.95; 95% CI 3.60-54.05), the presence of a pseudocapsule (OR 6.67; 95% CI 1.45-30.59) and alpha-fetoprotein levels (OR 1.004; 95% CI 1.000-1.007) were predictive factors for VLP on the multivariate logistic regression analysis [6].

In order to determine mRECIST tumour response, we have performed three separate analyses: nodule-based tumour response, target lesion response and overall response. In the nodule-based analysis, we have observed that the VLP group had a higher objective response rate than the non-VLP group (94.6% vs. 65.1%; p<0.001). On multivariate logistic regression, VLP (p=0.032), tumour size ≥3 cm in diameter (p=0.016) and the presence of a pseudocapsule (p=0.021) were statistically significant for improved tumour response. On a post hoc analysis, we found no significant association between a higher dose of drug-eluting beads or the use of additional bland beads and tumour response [6].

In addition, in a target lesion response analysis (94.6% vs. 71.6%; p=0.003) and overall response analysis (81.1% vs. 55.4%; p=0.004), the VLP group also presented higher objective response rates than the non-VLP group [6].

The results of these two last studies suggest that VLP may be associated with better local and overall response rates in patients that underwent DEB-TACE for HCC. Our next steps on this interesting topic will focus on histologic and follow-up studies, in order to go deeper into the structural characteristics that may cause VLP and the clinical relevance of the phenomenon.

References:
1. Lencioni R. Loco-regional treatment of hepatocellular carcinoma. Hepatology. 2010;52(2):762-73.
2. Majno P, Lencioni R, Mornex F, Girard N, Poon RT, Cherqui D. Is the treatment of hepatocellular carcinoma on the waiting list necessary? Liver Transplantation. 2011;17:S98-S108.
3. Nasser F, Cavalcante RN, Galastri FL, de Rezende MB, Felga GG, Travassos FB, et al. Safety and feasibility of same-day discharge of patients with hepatocellular carcinoma treated with transarterial chemoembolization with drug-eluting beads in a liver transplantation program. J Vasc Interv Radiol. 2014 Jul;25(7):1012-7.
4. Crespi S, Martinetti L, Nicolini A. Outcome of HCC patients presenting pooling phenomenom during TACE. Cardiovasc Intervent Radiol. 2013 Sep;36(3):S323.
5. Seki A, Hori S, Shimono C. Management of vascular lake phenomenom on angiography during chemoembolization with superabsorbent polymer microspheres. Jpn J Radiol. 2015 Dec;33(12):741-8.
6. Cavalcante RN, Nasser F, Motta-Leal-Filho JM, Affonso BB, Galastri FL, De Fina B, Garcia RG, Wolosker N. Occurrence of Vascular Lake Phenomenon as a Predictor of Improved Tumor Response in HCC Patients That Underwent DEB-TACE. Cardiovasc Intervent Radiol. 2017 Jul;40(7):1044-1051.

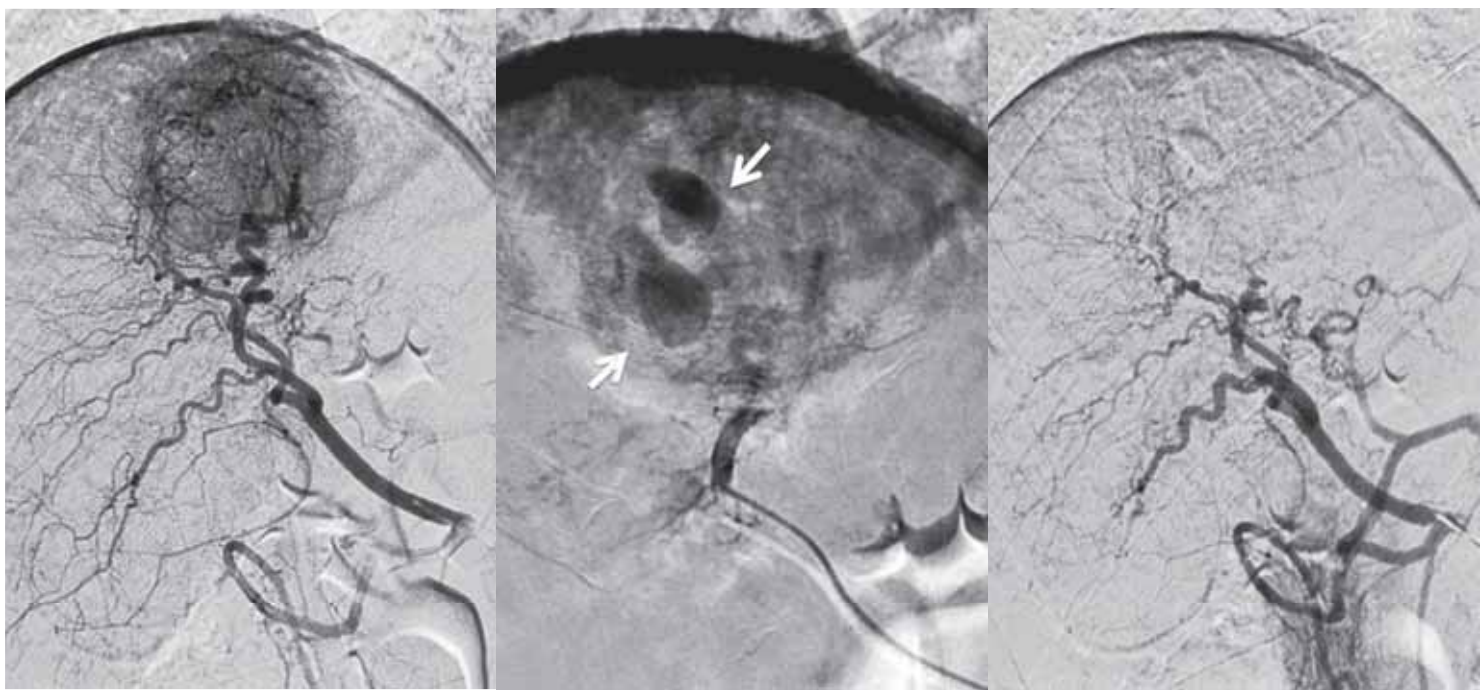

Fig. 1: A 33-year-old female patient, with a single tumour in segment VII: a) pre-embolisation hepatic angiography showing tumoural blushing on the right liver lobe; b) selective angiography after embolisation with DC-beads 100-300 µm showing the onset of VLP (arrow); c) selective angiography showing disappearence of VLP after additional embolisation with bland beads (Embosphere 300-500 µm and Contour 500-700 µm).

CIRSE Group Members: Welcome Canada!

At the start of the year, CAIR (formerly known as CIRA) joined CIRSE as its 37th group member, further strengthening ties across the Atlantic. We sat down with Jason Wong, President of the Canadian Association for Interventional Radiology (CAIR), to talk about interventional radiology in Canada.

CIRSE: CAIR has recently decided to become a CIRSE Group Member, how would you like to see these two societies working together?

Wong: One of CAIR's top priorities is education; specifically in the form of continuing medical education for physicians, education for our technicians and nurses, and most importantly, education for our patients. CIRSE has the largest online interventional radiology education portal and this will be of great benefit for our CAIR members. In the past, we have been very fortunate to have many CIRSE luminaries presenting at our CAIR meeting and I know that many Canadian IRs have presented at CIRSE meetings. It is my hope that the two societies will continue to foster and develop CME at both meetings. In addition, I hope that CAIR and CIRSE can collaborate to increase patient awareness of IR procedures and to educate them on the benefits of minimally invasive procedures. Lastly, in the past, other nascent IR associations have asked for CAIR's help to develop and become bigger organisations. This is also an area that both CIRSE and CAIR could collaborate – to further develop the global IR community.

CIRSE: Since gaining subspecialty status in 2013, how have clinical guidelines and undergraduate training for IR changed in Canada?

Wong: Since we have had subspecialty recognition, there have been a core group of IRs working on the training pathway at the Royal College of Physicians and Surgeons of Canada. The new training pathway will not only develop good technical skills but most importantly, ensure that young IRs have a strong clinical background to succeed. As you can imagine, there is a lot of work involved to build a robust training programme that can be disseminated to the entire country. The goal is to have a comprehensive training programme that is uniform within Canada. In addition, each university has its own set of rules and regulations and we have members from each university doing a lot of the heavy lifting in terms of paperwork and filing the applications. All this is to say that the process is robust but long. Our first fellows in this training pathway will hopefully start this year. Additionally, in parallel, CAIR is trying to further educate the current practicing IRs to become more clinically oriented as well.

CIRSE: Do you also feel that patient awareness of IR procedures in Canada has grown in these last five years?

Wong: I do feel that patient awareness of IR procedures is increasing. This is due to many factors, including the ubiquitous presence of the internet, social media and direct word of mouth from patients to their friends. Additionally, many of my IR colleagues are doing neat things to improve patient awareness around Canada. One of CAIR's main priorities is to increase patient awareness and we will be partnering with some patient advocacy groups to get the message out that IR procedures are safe, effective, minimally invasive, and this allows a patient to get back to their life quicker than a traditional surgical procedure. There is still lots of work to do, many patients say that they still do not know that a certain IR procedure existed, or that they have never heard of interventional radiology! Importantly and similarly, there are many family physicians and specialist physicians who unfortunately do not know the abilities of IRs and that there are many IR procedures available to help their respective patients.

CIRSE: What are some of the primary areas of research and practice in IR in Canada?

Wong: In Canada, we have some outstanding and passionate researchers. I don't even know where to begin. The following list is off the top of my head and certainly not exhaustive: Dr. Bob Abraham is doing research in intrinsic bland and Y-90 radiopaque embolic beads; Dr. David Valenti has many studies underway including selective nerve blocks for IO procedures, paediatric PICC line research; Dr. Dave Liu is working on innovative Y90 treatments; Dr. Darren Klass has research on transradial access as well as treatment of aortic dissection; Dr. Gilles Soulez has many graduate students looking at stress/strain models of aneurysms. One of my partners, Dr. Vamshi Kotha, is the principal investigator on research looking at novel type A aortic dissection repair. Also, many Canadian centres are involved in multicentre industry-sponsored trials, and one example is BTG's EPOCH and STOP HCC trials. Again, this list is certainly not comprehensive but more of a "tip of the iceberg".

CIRSE: Are there any things that Canada is doing in IR that you think Europe could benefit from, or vice versa?

Wong: I think Europe and Canada are highly aligned. I also think that Canadian IR practices are more similar to European IR practices than in other parts of the world. However, it is clear that IR use in Canada is far behind Europe and we need to spearhead the efforts to work with government and health centres to change this. I hope that CAIR and Canada can learn from Europe to increase the use of IR within Canada.

CIRSE: How do you envision the future of IR in Canada and globally?

Wong: I see a very bright future for IR in Canada and globally. I think patients are becoming more aware and more educated on IR procedures. This is mainly due to the minimally invasive nature and the desire to be able to return to their busy lives after a procedure. With the progression of technology and research, IR will be at the forefront to deliver this high-end, effective and cost-effective care. Furthermore, IRs in Canada and globally are becoming more clinical: providing a longitudinal care model, by seeing patients in clinic before and after procedures to ensure that proper treatment has occurred. This type of model will serve IR well and poise the subspecialty to be a leader in the future. Ultimately, this is amazing for the patients that we care for every day.

CAIR

Introducing CIRSE's New European Microwave Ablation Registry

Martin Hajek, CIRSE Office

Adding to established registries on radioembolisation and chemoembolisation, CIEMAR will be the first CIRSE-sponsored study focusing on microwave ablation of liver metastases from colorectal adenocarcinoma. Thermal ablation is an established procedure in the treatment plan of colorectal cancer that has demonstrated its efficiency in multiple prospective studies and is recommended in the current ESMO guidelines. After being used for about 20 years, large-scale multinational data on this treatment remains one of the blind spots in the scientific literature.

Why CIEMAR matters

Colorectal cancer is the second most diagnosed type of cancer in Europe and was the cause of death of 153,000 patients or 11.4% of all cancer-related deaths, in the European Union in 2014 (source: Eurostat). Up to 70% of patients with colorectal cancer develop liver metastases, and curative treatment of these metastases is limited to surgical resection or thermal ablation.

CIEMAR Objectives

CIEMAR is an observational study that aims to investigate the real-life application of microwave ablation of colorectal liver metastases in a large European cohort. The study is currently being designed by a multinational and multidisciplinary Steering Committee co-chaired by Prof. Philippe L. Pereira (SLK Kliniken Heilbronn, Heilbronn, Germany) and Prof. Thierry de Baère (Institut de Cancérologie Gustave Roussy, Villejuif, France). To achieve this goal CIEMAR plans to reach an enrolment of 1,000 patients over the course of two years with a follow-up duration of three years. Local tumour control in the liver will be used as the primary endpoint with the objective being to observe the use of microwave ablation in the liver to assess its effectiveness in an everyday clinical setting in Europe. In order to broaden the understanding of thermal ablation of liver metastases, CIEMAR will collect extensive data on safety and toxicity, quality of life, survival and economic aspects of the treatment.

Project Outlook

As CIRSE aims to conduct impactful high-quality research, the Steering Committee is in the process of designing a comprehensive registry protocol that is planned to be finalised in April 2019. Patient enrolment is projected to begin in early 2020. The study is independently conducted by the society by means of a research grant provided by Medtronic, the manufacturer of the Emprint microwave ablation system. CIRSE and Medtronic plan to work on this project until 2025 with the aim of improving our understanding of microwave ablation in the liver in Europe.

CIEMAR

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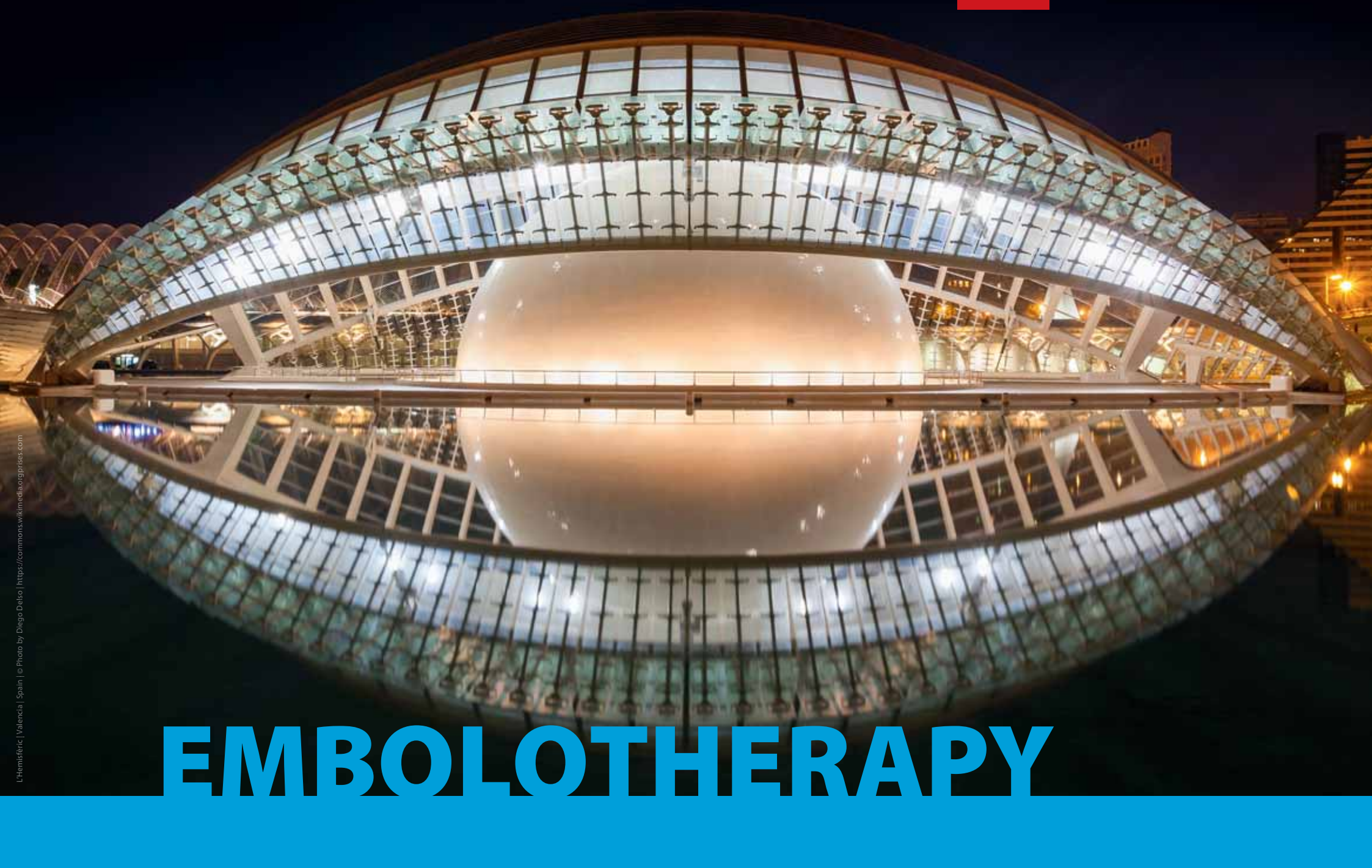

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CIRSE

How to build a research team in your IR department

Carole Déan

As a major player in innovation, interventional radiology actively participates in the development of new technologies, mainly in the field of medical devices. However, the new European Regulation on Medical Devices (EU 2017/745 of 5 April 2017) requires the collection of a greater amount of clinical data about the device, compared to the old regulation. For instance, the new regulation stipulates that clinical data has to be collected throughout the lifecycle of a device.

This talk has two key aims: firstly, to educate IR practicioners on how to build and organise a clinical research team in their IR department and secondly, to help practicioners familiarise themselves with creating a research plan. All information provided here is based on our experience in the IR department of HEGP in Paris as well as the recognition that research is important for improving patient care. In our view, any IR department willing to participate actively and ethically in clinical research should build a dedicated research team.

There are two main ways in which an IR practicioner can be involved in clinical research; they can either participate in trials that have already been launched or alternatively, develop new trials to address specific questions. The logical process is to first actively participate in a few trials to be able to develop effective studies afterwards. For instance, being an investigator in an academic or in a company-sponsored study provides a comprehensive oversight of the basic legal and logistical requirements.

The very first step for the IR is to obtain the Good Clinical Practice (GCP) certificate to attest that the practicioner is trained in clinical research because, as an investigator, the practitioner is obliged to fulfill legislation listed in national law which relates to clinical research. These rules are mandatory to keep their centre open and to avoid legal issues.

Before any inclusion, the IR is responsible for making sure that all the required authorisations are obtained, a contract is signed with the hospital/clinic, a site initiation visit is scheduled and their centre is officially open. Consequently, the IR's responsibilities include ensuring that the patients are properly informed and consent to participate, the visits are organised according to the protocol timeline, the data are correctly collected, the case report form (CRF) is filled in, the adverse events and serious adverse events are declared within the appropriate timeline, any further queries are answered, and finally, that the monitoring visits are settled and you are available to solve any issues. All this requires a lot of effort and a significant time investment, but the good news is that a dedicated team can help. The IR will keep the legal responsibility, but they will be assisted in their task by the clinical research assistant (CRA) who will take the charge of all the logistical aspects of the trial. The assistant will schedule the different visits with the sponsor or the delegated CRO, produce specific worksheets, schedule patients visits in the appropriate timeline, take the time to find missing data, fill in the CRF, communicate with the sponsor monitor, help with patient's screening, be in the cath lab to collect procedural data and also be with the physicians/radiographers to collect data out of IR scope. All of these time-consuming tasks can be delegated, and during the talk, certain clues will be given to help the subject with recruiting their CRA.

Once the practicioner becomes familiar with participating in a trial, they may wish to elaborate their own research. In the light of a failure experienced by the IR department of HEGP in Paris, this talk will help others avoid some pitfalls in study elaboration. Merely having the patients and good intentions is not enough. The IR needs to collaborate closely with a number of stakeholders including methodologists, other clinical departments, statisticians, administration, the financial department and so forth.

To achieve this goal, having a clinical research manager in the team could make all the difference. Their role is to translate the idea into a protocol, as well as to be the link between the IR and the different collaborators, helping to advance the entire project, and in this talk, some clues will be given to assist IRs in finding their clinical research manager. Lastly, based on our experience in the protocol PARTEM on PAE, the talk will cover the different steps of the trial in detail, from funding and patient inclusion to the mistakes in the protocol wording and setting that will not be repeated.

Don't miss it !
Clinical trials in IR: what an IR has to know in clinical research
Focus Session
Tuesday, September 25, 08:30-09:30
Room 5.A

Carole Déan
Hôpital Européen Georges-Pompidou
Paris, France

Carole Déan currently works as a clinical research manager at the Hôpital Européen Georges Pompidou in Paris, France where she manages clinical trials in the field of medical devices for interventional radiology. Previously, Ms. Déan was a researcher in basic medical sciences at the Vessels and Blood Institute and Sanofi-Aventis as well as a lecturer at the Université Victor Segalen. She is the co-author of over 20 publications in peer-reviewed scientific and medical journals. She holds a PhD in medical and biological sciences from the Université Bordeaux II and a postgraduate diploma in Advanced Clinical Research from Université Paris VII.

News on Stage

News on Stage will feature displays on the latest results from multi-centric trials, ground-breaking techniques and many more IR hot topics, shown in a dedicated open area. Large-screen presentations given by the authors during dedicated slots around lunch time will give delegates the opportunity to hear from the experts and engage with them and other key opinion leaders in active, lively discussions.

Tuesday, September 25, 13:15-14:15, News on Stage Area

NoS 2804 Interventional Oncology News on Stage

Moderators: F. Orsi (Milan/IT), J. Ricke (Munich/DE)

2804.1 Prospective randomized trial: tumor response of colorectal liver metastases after transarterial chemoembolization with two different protocols using MRI
T.J. Vogl, M.C. Langenbach, C. Marco, R. Hammerstingl, J. Scholz, T. Gruber-Rouh; Frankfurt/DE

2804.2 The usefulness of liver parenchymal perfusion simulation using commercial 3-dimensional workstation and simulation software in conventional transcatheter arterial chemoembolization for hepatocellular carcinoma
M. Kinoshita[1], K. Takechi[2], Y. Arai[2], R. Shirono[2], Y. Nagao[2], S. Izumi[2], S. Noda[1], S. Takao[1], S. Iwamoto[1], M. Harada[1]; [1]Tokushima, JP, [2]Komatsushima/JP

2804.3 WITHDRAWN

2804.4 In vitro bovine liver experiment of cisplatin-infused and normal saline-infused radiofrequency ablation with an internally cooled perfusion electrode
K. Park, H.P. Hong; Seoul/KR

2804.5 Stereotactically navigated percutaneous microwave ablation (MWA) compared to conventional MWA: a matched pair analysis
L.P. Beyer, L. Lurken, B. Pregler, J. Schaible, P. Wiggermann; Regensburg/DE

2804.6 Irreversible electroporation in central renal tumor
A. Camacho Martinez, J.M. Abadal Villayandre, E. Galvez, M.J. Alvarez; Madrid/ES

Adjusting selection based on DEFUSE and DAWN trials

Elke R. Gizewski

Don't miss it !
Essentials in IAT
Clinical Evaluation Course
Tuesday, September 25, 10:00-11:00
Auditorium 1

Since the first five randomised trials in 2015, the inclusion criteria for mechanical thrombectomy in acute stroke patients have changed continuously. In the first studies, the same inclusion criteria were used for mechanical thrombectomy as for IV thrombolysis, namely: large vessel occlusion of the internal carotid artery (ICA) or middle cerebral artery (MCA), ASPECT score 6-10, within 6 hours of onset [1, 2].

Within the last few years, further studies and sub-group analyses were published. The main sub-group analyses focused on the search for possible exclusion criteria (e.g. patients with no or negligible benefit from thrombectomy). However, no such exclusion parameter could be identified; neither age, gender, NIHSS, ASPECT values, location, nor tandem lesion revealed any significant predictor. The only positive predictor for better outcome was the time from onset to recanalisation [3].

A more controversial point is the use of CT or MR perfusion for patient selection. Within the early time window (up to 6 hours), even sub-group analyses could not identify a convincing imaging biomarker for selecting patients. However, visualisation of sufficient collateral flow in addition to the ASPECT score proved to be helpful in some cases.

With increasing evidence for good outcomes in patients outside the above-mentioned criteria, further studies were conducted. The demonstration of preserved collateral flow to the brain tissue at risk is especially helpful for selecting patients with a good ASPECT score who present later than 6 hours after the onset of an ischaemic stroke. This led to the conclusion that the time window is not the only valuable criterion for patient selection.

The first randomised study including patients in an extended time window was the DAWN study [4]. This study enrolled patients with occlusion of the ICA or proximal MCA. The time window between onset of symptoms and treatment was 6–24 hours. In addition, all patients had a mismatch between the severity of the clinical deficit and the infarct volume. The mismatch criteria were defined according to age and infarct core. The mismatch of infarct core and clinical symptoms was assessed by CT perfusion or MR imaging (diffusion-weighted images). Patients were randomly assigned to thrombectomy plus standard care or to standard care alone. The main end-point was the utility-weighted modified Rankin scale (mRS; ranges 0 to 6) and the rate of functional independence (mRS 0–2 at 90 days). Interestingly, the study had to be stopped after the first 206 patients because of the significant benefit in the thrombectomy group in interim analysis. The mean score on the utility-weighted mRS was 5.5 in the thrombectomy group and 3.4 in the control group, and the rate of functional independence at 90 days was 49% in the thrombectomy group and 13% in the control group. The rate of symptomatic intracranial haemorrhage or mortality did not differ significantly between the two groups.

A few months later, a second study including patients in an extended time window was published: the DEFUSE study [5]. This multicentre, randomised, open-label trial included patients between 6 to 16 hours after onset of symptoms with a significant difference between malperfused brain tissue and infarct size. The inclusion criteria were: proximal MCA or ICA occlusion, an initial infarct size of less than 70 ml, and a ratio of the volume of ischaemic tissue on CT- or MR-perfusion imaging to infarct volume of 1.8 or more. The primary outcome was the mRS at day 90. This study was also terminated earlier than planned (after 182 patients) because of the significant benefit for patients undergoing thrombectomy. Endovascular therapy plus medical therapy showed a favourable shift in the distribution of functional outcomes on the mRS (odds ratio, 2.77) and a higher percentage of patients who were functionally independent at 90 days (45% vs. 17%). The 90-day mortality rate was 14% in the endovascular therapy group compared to 26% in the medical therapy group. There was no significant difference of symptomatic intracranial haemorrhage or of serious adverse events.

Following these two landmark studies, further results providing additional evidence for treating patients beyond 6 hours were published, for example a stroke network's experience of late intervention using endovascular thrombectomy beyond 12 hours of stroke onset [6]. In this study, out of 542 consecutive endovascular thrombectomy cases, 25 (4.6%) were later than 12 hours from stroke onset. NIHSS on presentation was 14 (IQR 11–18.5) and median ASPECTS was 8 (IQR 8–9). Multiphase CTA was used and showed a rate of moderate-good collateral status in 96% (n=24). Median time between onset of symptoms and groin puncture was 14:40 hours. The rate of successful recanalisation (2b–3) was 88%, resulting in functional independence after 90 days (mRS 0–2) in 52%.

The results of these studies indicate that patient selection for thrombectomy in acute stroke has to be re-defined according to the significant benefit even after 6 hours of onset. Patients with a relatively small area of core infarction as shown by perfusion-imaging (CTP or MRP), MR diffusion or multiphase CTA and a large artery occlusion with severe clinical symptoms will most likely benefit from thrombectomy combined with medical treatment.

However, we have to bear in mind: time still matters!!! Even with an extended time window with additional imaging criteria indicating better outcomes, patients should be treated as soon and as fast as possible to achieve the best outcome. Further studies or sub-group analyses may also indicate that patients with a good ASPECT score and severe clinical symptoms can also be selected for thrombectomy in an extended time window; however, this topic has not been addressed so far. Further studies have started recently, e.g. thrombectomy in patients within the early time window, but ASPECT score 3–5. We can be curious where the path of thrombectomy will lead us in the coming years.

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Prof. Gizewski is a Professor as well as the Deputy Managing Director of the Neurology Department, Medical University of Innsbruck. She studied medicine at the University of Duisburg-Essen and subsequently became a resident at the Institute for Diagnostic and Interventional Radiology and Neuroradiology in the Department of Nuclear Medicine at the same institution. She was appointed as an adjunct Professor there in 2009 and a year later became the Director of the Department of Neuroradiology at the Justus Liebig University in the city of Giessen, before moving to her current role the Medical University of Innsbruck. Her scientific focus consists of functional and structural MRI, high-field MRI, ultra-high-field MR and interventional neuroradiology.

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SMART AND SAFE!

CIRSE **Radiation Protection**

How to make your angio suite smart and safe!

Visit the Radiation Protection Pavilion

CIRSE's Radiation Protection Pavilion, located in the exhibition hall, is here for you during the entire Annual Meeting, offering information material and opportunities to engage directly with experts in radiation protection. Interventional radiologists are exposed to high levels of radiation in daily practice and therefore face particular health risks. Take a seat in the Radiation Protection Pavilion and learn how to reduce and protect against exposure.

Today's RPP Mini-Talks, which feature short expert presentations, cover a wide range of topics delving further into various aspects of radiation safety.
We hope to see you there!

Today's RPP Mini-Talks

	Time	Mini-Talk	Speaker
TUE SEPT 25	11:00 – 11:15	Live demonstration on ANGIO Mentor simulator – reducing dose levels during prostate embolisation (3D Systems)	F.C. Carnevale *(São Paulo/BR)*
	11:15 – 11:30	High dose procedures: how to manage dose in TIPS	A. Moelker *(Bergschenhoek/NL)*
	13:00 – 13:15	Establishment of clinical diagnostic reference levels for Europe (EuroSafe Imaging)	W. Jaschke *(Innsbruck/AT)*
	13:30 – 13:45	High dose procedures: how to manage dose in liver embolisation	R. Kickuth *(Würzburg/DE)*

16:15-17:15, Room 5.B

Free Paper Session

FP 3006 Super Tuesday

SUPER TUESDAY

Moderators: T.J. Kroencke (Augsburg/DE), D.A. Valenti (Montreal, QC/CA)

3006.1 Incidence of new osteoporotic vertebral compression fractures and further vertebral height loss after vertebroplasty compared with a sham procedure. Results from VERTOS IV trial
C.E. Firanescu, P.N.M. Lohle; Tilburg/NL

3006.2 Geniculate artery embolization (GAE) for osteoarthritis (OA)-related knee pain: interim results from a multicenter US trial
R. Piechowiak[1], S. Bagla[1], J. Orlando[1], T. Hartman[2], A. Isaacson[2]; [1]Woodbridge, VA/US, [2]Chapel Hill, NC/US

3006.3 Portal vein embolization, simple and extended liver venous deprivation before major hepatectomy: which is the best technique for liver preparation?
B. Guiu, C. Cassinotto, L. Piron, J. Delicque, C. Allimant, V. Schembri, F. Quenet, E. Deshayes; Montpellier/FR

3006.4 Percutaneous irreversible electroporation to treat locally advanced pancreatic cancer: the PANFIRE-2 trial final results
A.H. Ruarus, L.G. Vroomen, R.S. Puijk, M.C. de Jong, B.M. Zonderhuis, M.G.H. Besselink, M.P. van den Tol, F. van Delft, H.J. Scheffer, G. Kazemier, M.R. Meijerink; Amsterdam/NL

3006.5 Percutaneous MR-guided whole-gland prostate cancer cryoablation: first results at 5 five years and safety considerations
P. De Marini, R.L. Cazzato, J. Garnon, M. Gaullier, G. Koch, J. Caudrelier, H. Lang, A. Gangi; Strasbourg/FR

3006.6 Minimum ablation margin assessment with intraprocedural FDG perfusion PET during PET/CT guided liver tumor ablation
A.J. Cubre, P.B. Shyn, K. Tuncali, V. Levesque, T. Kapur, V. Gerbaudo, S. Silverman; Boston, MA/US

3006.7 Prostatic artery embolization versus transurethral resection of the prostate in the treatment of benign prostatic hyperplasia: 12-month results of a clinical trial
A. Sáez de Ocáriz García, I. Insausti Gorbea, S. Solchaga Álvarez, R. Monreal Beortegui, P.J. Giral Villalta, S. Napal Lecumberri, F. Urtasun Grijalba; Pamplona/ES

The Female Threat

Anna Belli and Meridith Englander

Published in CVIR in May 2018, this paper by Prof. Anna-Maria Belli and Dr. Meridith Englander explores how the gender gap is a great obstacle to the expansion of the subspecialty.

It has only been 100 years or less since women earned the right to vote throughout Europe and in the USA. Since that time, women have entered the workforce and joined the professions. Whereas once they were barred from professional medical practice, the percentage of medical school graduates that were women rose from approximately 10% in the 1960s to over 50% in the early part of this century. The number of women physicians is also increasing. This past year, for the first time ever, the province of Quebec reported more female physicians in practice than male. This changing demographic has implications for medical practice as women are needed in all the specialties to ensure equitable availability of services for patients.

According to the 2016 UK radiology workforce census, 35% of consultant radiologists and 39% of trainees are female, but only 10% of the current consultant IR body is female. At both CIRSE and SIR, only 12% of full members are women. Although precise figures vary between countries and continents, this phenomenon is repeated globally. Interventional radiology (IR) is under threat, not just by competing specialties, but by its apparent lack of attraction to women. Unless IR is able to reverse this and recruit more women, it will be missing out on some of the most talented medical graduates and may have trouble filling all the jobs. In the UK, there is already a crisis of not enough interventional radiologists to meet the need.

In 2009, the Royal College of Physicians of the UK published research into the implications of the rapidly increasing share of female doctors on the medical profession. The two major findings from this report were that women doctors had a far greater preference for flexible working arrangements with scheduled work hours and they preferred specialties offering greater patient interaction. There are many aspects of IR which should appeal to women. It offers patient interaction and longitudinal care and the opportunity to make a real difference to patients' lives using innovative, minimally invasive procedures. It is constantly progressing and evolving, and consequently, is never boring. IR is inclusive of almost every body system, and there is the opportunity to develop a subspecialty interest in areas including interventional oncology, vascular disease, women's health, neurovascular and paediatrics, to name but a few.

So why aren't women flocking to IR? Assuming they learn about IR in medical school (and that is an issue in itself), the fact that radiation is involved is a big deterrent. This is despite the fact that nowadays occupational radiation exposure to IRs is similar to the natural background dose and most female IRs who continue to work through their pregnancy have foetal radiation doses well below recommended guidelines.

Medical graduates choosing their career need to know these facts, but some of those practising IR inadvertently perpetuate misinformation by excluding or discouraging women who are pregnant from performing fluoroscopically guided interventions. This gives the message that occupational radiation exposure is dangerous. The result is that women's training is derailed and the pregnant woman is perceived as a burden to her IR colleagues who have to cover the work and on-call responsibilities. Nobody would argue that it is a woman's choice to avoid radiation exposure during pregnancy, but it should be made clear that this is a choice with two valid alternatives.

Some will prefer to select a specialty offering a different work–life balance, with less emergency work. This is true for both genders and applies to many specialties. There is no doubt that women will and can work hard and long; just look at the number of female obstetricians. Perhaps most of IR has not applied itself to imagining flexible work schedules which allow staff to have more predictable working hours. This may be a consequence of insufficient numbers of IRs to allow flexibility. Or perhaps, there is no perceived need for change by a currently male-dominated specialty.

The lack of female role models is also a problem. If women do not see other women flourishing in a specialty, they are likely to think it is an unsuitable career choice for them. After all, if it were a great field for women, wouldn't there be more women? It is imperative that female IRs show themselves and speak up by taking leadership roles in their departments and at the society level. It is also incumbent on male colleagues to act as allies for women. We need to work together to assure that women in IR are given the same opportunities to succeed as men.

These two authors have had stimulating and satisfying careers in IR, have achieved international recognition, received great support from male and female colleagues alike and have enjoyed successful family lives. We are not exceptional but dedicated to the specialty that we love and to the patients that we treat. And, we are not alone.

Many IR societies throughout the world are awakening to the threat that attracting insufficient numbers of women to IR poses and are encouraging women to get involved. We owe it to our patients that this specialty should continue to thrive and innovate. That can only be done by continuing to inspire and attract the brightest graduates who are increasingly women. The workforce needs to reflect the population, allowing patients' choice not only in how they are treated, but also by whom they are treated.

If we fail in this, IR will fail too. If we succeed, then we will have a well-balanced, intelligent and expanding workforce with a successful future.

Belli AM, Englander M. Cardiovasc Intervent Radiol. 2018; https://doi.org/10.1007/s00270-018-1915-2

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Dr. Meridith Englander is an interventional radiologist at Albany Medical Centre Hospital in New York State.

The first Women in IR Session at CIRSE 2017

IDEAS 2018

Maximum conservative treatment in uncomplicated TBAD

Ian Loftus

Don't miss it !
Hot debates in aortic interventions
Controversy Session
Tuesday, September 25, 16:15-17:15
Auditorium 2

Definitive management of uncomplicated Stanford type B thoracic aortic dissection (TBAD) is a clinical challenge. Patients with uncomplicated TBAD patients have a 20-30% of aortic dilation. However, surgical management poses specific risks of complications and mortality. As a result, there is ongoing debate of how best to treat these patients.

In the US Medicare population, between 2000 and 2010, the overall rate of repair of TBAD increased by 21%, with a significant decrease in the rate of open surgical repair and a marked increase in the rate of thoracic endovascular repair (TEVAR).

Current classification of aortic dissection includes time from presentation and a further sub-classification into complicated and uncomplicated. Management for TBAD is generally based on whether the presentation is associated with complications. Most agree that acute complicated TBAD should be treated with TEVAR, if feasible. In uncomplicated TBAD, despite the absence of complications, patients have an in-hospital mortality of 3-10%. TEVAR-related complications can be severe, including up to 10% risk of stroke, paraplegia, retrograde type A dissection and death. As a result, equipoise still exist on the management of acute uncomplicated type B dissections fuelling debates on the best management of TBAD.

Initial management, unless there is severe end-organ malperfusion or rupture, should comprise intensive monitoring and maximum medical therapy to control blood pressure, cardiac output and pain. The first-line treatment of blood pressure involves the use of β-blockers, with the aim to reduce the systolic blood pressure to between 100-120mmHg and a heart rate <60 beats per minute. This should be combined with adequate and liberal use of analgesic agents as required. Close monitoring and repeated CT surveillance to identify signs of disease progression and potential development of complications is needed.

The latest guidelines published by the European Society of Vascular Surgery recommend that patients with acute uncomplicated TBAD should be treated conservatively, but may benefit from TEVAR in the subacute phase. The rationale behind intervention is to cover the entry tear, reduce the pressure in the false lumen, promoting false lumen thrombosis and thus prevent late aneurysmal dilatation.

Up to this date, there have been two randomised controlled trials, the INSTEAD-XL and the ADSORB trial. In the INSTEAD-XL trial, 140 patients were randomised to optimal medical treatment and TEVAR or optimal medical management alone. For years 2-5 after randomisation, there was no significant difference for the risk of all-cause mortality. However, there was a significant reduction in the risk for aorta-specific mortality with TEVAR, and reduced progression of disease which persisted after landmark analysis.

In the ADSORB trial, 61 patients were randomised either to optimal medical treatment and TEVAR or optimal medical management alone. After one year, patients randomised to medical treatment and TEVAR experienced a reduction in the false lumen size with an increase in the true lumen size. There were limitations with both trials and it is difficult to draw robust conclusions or recommend dramatic changes to established clinical practice.

Our literature search revealed 110 studies from 1999-2018. However, only three observational studies have been published since 2015, one in abstract form. Numbers of patients treated were consistently low, highlighting the difficulty of studying this cohort of patients. Furthermore, patients with complicated and uncomplicated TBAD were often combined. In one relatively large series of 338 patients with uncomplicated TBAD from 3 tertiary medical centres, by Qin et al. in 2016, 184 patients received TEVAR and best medical therapy (BMT) and 154 patients received BMT only. Early events and 30-day mortality were not significantly different between the 2 groups. Patients receiving BMT had significantly higher aortic-related adverse events compared with those in the TEVAR group (46.7% vs 71%, p=0.025). All-cause mortality with TEVAR was significantly lower than that of BMT (p=0.01) with 0% mortality of patients receiving TEVAR in the subacute phase.

One meta-analysis has been recently published by Li et al. comparing: TEVAR with BMT vs. BMT alone, open surgical repair (OSR) with BMT vs. BMT, and TEVAR with BMT vs. OSR with BMT. When analysing the TEVAR with BMT vs. BMT only, there was no difference in 30-day mortality or in-hospital mortality. However TEVAR with BMT provided better results of long-term survival rate compared with BMT only (hazards ratio (HR) = 0.71; 95% confidence interval (CI): 0.52–0.95). On further analysis, TEVAR with BMT was associated with a higher rate of stroke (odds ratio (OR) = 1.65; 95% CI: 1.21–2.23), but a lower rate of late rupture (OR = 0.21; 95% CI: 0.10–0.43) and late aneurysmal dilatation (OR = 0.15; 95% CI: 0.04–0.63). TEVAR had the greatest probability for being the first effective treatment (probability of 84%) on long-term survival, while OSR (probability of 79%) and BMT (probability of 70%) showed less effective treatment, respectively. However on subgroup analysis stratifying patients by severity (complicated TBAD, uncomplicated TBAD or mixed), the pooled results were not significant for studies covering patients with uncomplicated TBAD only.

All studies and guidelines, whatever the treatment option chosen, recommend life-long clinical and imaging surveillance to monitor for persistent false lumen perfusion and aortic dilatation in uncomplicated acute TBAD. However little is known as to whether patients are being compliant to surveillance programmes. In an observational study by Afifi et al., over a median follow-up time of 4.6 years, loss to follow-up for long-term re-intervention for the overall cohort was 22%, although the non-compliance rate was not provided. Sensitivity analysis for long-term re-intervention among patients with incomplete follow-up demonstrated a 4.7% increase in possible re-interventions.

As a result, given the lack of data compliance to TBAD surveillance protocols, the true picture of aortic remodelling with persistent false lumen perfusion and its implications will remain difficult to understand fully. This holds true for patients treated with TEVAR and BMT, and also for those treated with medical management only.

Using the current evidence, the vascular community is still unconvinced about early intervention for uncomplicated TBAD. However, there is a growing trend to tailor the management to the individual patient. There is a need to understand anatomical, morphological and clinical features that predict patients at high risk of developing complications, and experts believe that this is the best way to tackle this equipoise for uncomplicated TBAD.

Currently, there are a number of variables which can help predict patients at higher risk of developing complications, but there are too many predictors to accurately predict late behaviour. However, predictors can be based on initial presentation, clinical characteristics and follow-up imaging.

Studies have shown that acute initial characteristics associated with complications included increasing age (with age of 70 years or older have the highest risk of mortality), male gender, arterial hypertension, aortic dissection diameter, partial thrombosis of the false lumen and enhanced focal 18F-FDG uptake. The patients with primary tears located in the distal arch (zone 3) and the number of vessels originating from the false lumen have a higher risk of developing late complications. During in-patient stay, recurrent pain or refractory hypertension should be considered signs of potential extension of dissection or diameter increase and represent increased risk of poor outcome without intervention.

In conclusion, there is evidence to suggest that thrombus biological dynamics may drive progressive expansion of type B dissections and 20% of patients with uncomplicated TBAD will develop an aneurysmal dilatation of the false lumen, requiring late surgical intervention. As a result there is a need to identify and treat those patients at high risk of developing complications. Given the equipoise of management of uncomplicated TBAD which is unlikely to be answered soon by a randomised control trial, it is it probably time for a registry-based international clinical trial.

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Prof. Ian Loftus did his vascular surgery training in Leicester and was appointed as a consultant at St. George's Hospital, London in 2004. He is now Professor in Vascular Surgery at St. George's University of London, as well as Director of the Regional Aneurysm Screening Programme and Clinical Tutor for Critical Care at the Royal College of Surgeons of England. He sits on the Council of the Vascular Society of Great Britain, and the British Society for Endovascular Therapy. Prof. Loftus has been a member of the national quality improvement programme (QIP) for vascular surgery, including the lead for the London Aneurysm QIP, and Department of Health working on peri-operative care. He has published almost 200 papers and contributed to numerous books relating to vascular and venous disease.

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Prof. Loftus will argue his case against Dr. Richard McWilliams today at 16:15. Don't miss this and the other exciting debates!

Open surgery better for juxtarenal aneurysms
S. Michelagnoli (Florence/IT)

Endovascular repair better for juxtarenal aneurysms
A. Winterbottom (Cambridge/UK)

The EVAR concept cannot prevent late failures from late ruptures
G.N. Kouvelos (Larissa/GR)

Late failures can be avoided (proper case, device and technique selection)
A. Hyhlik-Dürr (Augsburg/DE)

STUDENT CORNER

Risha Rose, CIRSE Office

COMING SOON! A newly updated IR Curriculum for Medical Students

In order to increase awareness and knowledge of the ever-expanding role that interventional radiology plays in modern medicine, in 2012 CIRSE published an IR Curriculum for Medical Students, stimulating awareness of IR throughout Europe. As the subspecialty continues to grow and advance, CIRSE recognises that the teaching of radiology in medical schools has become vital both for the education of medical students as well as for their future careers (regardless of specialty). The Society has thus formed a new Task Force, chaired by CIRSE Treasurer Prof. Christoph Binkert, with the aim of creating a new curriculum to mirror these needs. The new IR Curriculum for Medical Students will introduce interventional radiology to all those currently studying medicine, and also act as a guide for medical professionals teaching radiology programmes.

We had a chance to ask one of the Task Force Members, Dr. Roberto Cazzato from the University Hospital of Strasbourg, a few questions on what to expect from the new Curriculum. Read on to find out what he had to say!

CIRSE: For those who have not heard of the Undergraduate Curriculum for Medical Students, can you give a brief overview of what it is?

Cazzato: The curriculum is an official CIRSE document, which was created to provide an updated outline of the most relevant IR topics and procedures in order to firstly, provide an educational tool for professionals involved in the organisation of radiology training programmes and secondly, introduce IR to medical students.

CIRSE: How will the new curriculum differ from the old one that was published in 2012?

Cazzato: IR is a rapidly evolving discipline, so the curriculum will be updated to include the most relevant "new-entry" procedures. Moreover, the basic topics contained within the curriculum will provide inspiration for the production of short videos intended to promote IR among medical students.

CIRSE: Tell us about the videos. How will they help to promote the Undergraduate Curriculum?

Cazzato: The videos will be designed to introduce students and young medical professionals to IR by showcasing both the existence of interventional radiology, as well as the numerous benefits that minimally invasive treatments offer patients. Since we live in the Facebook and YouTube era, we thought it would be more effective to capture the attention of younger generations using the video format. Each video will focus on a single IR topic or procedure.

CIRSE: What are some of the main areas that will be covered in the curriculum?

Cazzato: There are four main areas of interventional radiology: vascular, non-vascular, interventional oncology and musculoskeletal (MSK). While the largest area still remains vascular IR, the other three areas will also be covered.

CIRSE: How would you encourage medical students to choose IR?

Cazzato: I would encourage medical students to attend IR conferences and visit the angio suite to see for themselves how strongly committed and enthusiastic IRs are to innovation and their work. Staying curious is key, and getting involved to find what suits your interests best is important. When I was a medical student, I attended an IR conference that advertised the interventional radiologists as superheroes. Originally, I thought these IRs were crazy, but when I looked at the procedures they performed, I quickly realised that these physicians are the real super heroes of modern medicine. This realisation confirmed my desire to become an IR.

CIRSE: What advice would you give to young and aspiring IRs throughout Europe who are just starting their IR training?

Cazzato: Your dreams can become a reality! Stay motivated, curious and work hard to achieve what you want. IR is a continuously evolving discipline so, as an interventional radiologist, you should be a leader in innovation, and continuously adapt to the changing medical landscape.

QUESTIONS OF THE DAY

Tuesday, September 25, 2018

Be in with a chance to win daily prizes by sending your correctly answered questions to **students@cirse.org** by 18:00 tonight!

Answers to the below questions can be found within today's Congress News.

The first three correct responses will win €25 Amazon vouchers. Ready… set… GO!

1. ■■■■■■ is the **first CIRSE-sponsored** study focusing on microwave ablation of liver metastases from colorectal adenocarcinoma.
2. In the article dedicated to drug-eluting bead transarterial chemoembolisation Dr. Cavalcante uses the term **VLP.** What does it stand for?
3. What are the **three major classes** of medications Dr. Garnon spoke about in his keynote lecture at ICCIR in June 2018?
4. The **new home** for congress presentations and topic packages:
5. What, according to Prof. Anna Belli and Dr. Meridith Englander, is the **threat facing IR?**

Students in the Spotlight

We had a chance to speak with some of your peers about their interest in medicine and experiences studying throughout Europe. Meet today's students from Germany and Italy.

Leona Alizadeh
Germany

CIRSE: What kind of exposure do you get to IR at your university and within your undergraduate studies?

Alizadeh: My first encounter with IR was during an internship in the department of radiology in my fifth semester of medical school. I had not yet learned about IR in my regular curriculum and was quite surprised to hear about the many treatment possibilities that IR offers. I was also fascinated by how much practical work you can do as a radiologist, beyond regular diagnostics. After this, IR was sadly a subject of minor priority in the regular curriculum. The importance of IR treatments was only mentioned in the radiology lectures and scarcely in other subjects.

CIRSE: How did you hear about the CIRSE Annual Congress and Student Programme and why did you decide to attend?

Alizadeh : When I visited my first IR congress (ECIO 2017 in Bilbao, Spain) I learned about the Annual CIRSE Meeting, and immediately wanted to visit it. I wanted to see the whole IR spectrum and all the possibilities I have for later specialisation. As CIRSE is one of the biggest IR congresses providing a huge variety of different lectures as well as seminars and hands-on-trainings for medical students, it seems to be the ideal event to attend.

Pierfrancesco Lapolla
Italy

CIRSE: How did you hear about interventional radiology?

Lapolla: They say the best things sometimes happen by chance, and that's how I was first exposed to IR. For my university's diagnostic imaging course practical activity, I was randomly assigned to the IR unit. Seeing the interventional radiologists wearing their lead aprons, managing catheters and wires, and using a range of imaging modalities and techniques simply amazed me.

CIRSE: Why did you decide to study medicine and why are you interested in IR?

Lapolla: A fascination for the human body and curiosity to understand its function were the most compelling reasons for me to study medicine. I believe that precise and personalised medicine will be the future of healthcare, and I wish to be a part of that future. An attractive feature of interventional radiology is its cutting-edge procedures and ongoing development of new techniques and devices. It is very exciting!

Crossword puzzle answers from Monday's Student Corner:

1. Embolisation 2. Connect 3. Cholangitis 4. Miradouros 5. Andreas Gruentzig 6. Students Quiz 7. Angioplasty 8. Jerónimos Monastery 9. Hypertension 10. Ablation

be inspIRed...

5 Ways to keep learning about IR after you leave CIRSE 2018

1. CIRSE Publications

Students can get acquainted with CIRSE and interventional radiology by reading the various CIRSE publications, which are intended to inform the IR community about current happenings and support interventional radiologists in their daily practice. The society newsletter, *IR News,* which is published and sent to CIRSE Members tri-annually, is also available to access online. From society news and expert interviews, to meeting announcements and session previews, to educational information and support, *IR News* is a must-read for aspiring IRs. Likewise, all current and past editions of the *Congress Newspaper* can be read online year-round.

2. Medical Journals

Founded in 1978, *CardioVascular and Interventional Radiology (CVIR),* is CIRSE's official journal and available for online subscription. While subscription is free only for CIRSE Members, students can benefit from selected articles that are available through CVIRonline.org free of charge. Additionally, CIRSE recently launched a new journal to heed the growing endovascular field. CVIR Endovascular is a multidisciplinary open access and open peer-reviewed journal. Articles from *CVIR Endovascular* can be read online at CVIRendovascular.org.

3. Social Media

Students can stay connected with the IR community by following CIRSE's many media channels. Facebook, Twitter, LinkedIn and YouTube will all provide up-to-date information on what's going on in the world of interventional radiology. CIRSE's YouTube channel engages audiences with special topic segments and commentaries on IR's newest innovations. Through Facebook, CIRSE also offers content tailored to students (CIRSE students) and residents (European Trainee Forum). Students can like these pages to stay informed on how CIRSE is supporting the next generation of IRs.

4. National IR Society

Looking to get involved in IR on a national level? CIRSE strives to forge strong partnerships with European and international IR societies, with the objective to advance interventional radiology worldwide. Medical students wishing to increase, improve, or get involved in the IR opportunities available to them in their country should reach out to their national society for support. For a list of national IR societies who are also CIRSE Group Members, please visit the CIRSE website.

5. Your University

While interventional radiology is a relatively young field of medicine, its level of growth and innovation is rapid, promising the subspecialty a leading position in modern medicine. Some universities have already recognised this and incorporated IR into their undergraduate curriculum in various forms, with professors encouraging students to attend congresses such as CIRSE. Many students, however, are lucky if they stumble upon IR accidentally during their courses. Interventional radiology is a growing subspecialty that deserves merit from medical universities across Europe, and students can have a collective voice in encouraging more IR exposure within their undergraduate studies. Getting involved and active within your university is an excellent way to foster improved educational opportunities in the field of IR.

Today's Highlights!

FC 2504: Postpartum haemorrhage
08:30-09:30, Auditorium 8

FS 2505: IAT: where do we stand?
08:30-09:30, Room 3.A

CEC 2603: Kidney tumours
10:00-11:00, Auditorium 8

CEC 2605: Essentials in IAT
10:00-11:00, Auditorium 1

IRT 2606: Clinical know-how
10:00-11:00, Room 3.A

Students' Quiz
11:00-13:00, Room Master (Vila Galé Ópera)

CBD 2704: IR for surgical disasters
11:30-12:30, Auditorium 8

MM 2902: Morbidity and Mortality
15:00-16:00, Auditorium 1

FC 3005: Biopsy
16:15-17:15, Room 5.A

DON'T LEAVE WITHOUT PICKING UP YOUR CERTIFICATION OF ATTENDANCE!

IR Congress News is published as an additional source of information for all CIRSE 2018 participants. The articles and advertorials in this newspaper reflect the authors' opinions. CIRSE does not accept any responsibility regarding their content.
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CONGRATULATIONS TO THIS YEAR'S CVIR AWARD WINNERS!

The prestigious **"2018 Editors' Medal"** was awarded to:

Qi-Feng Chen and Zhen-Yu Jia et al.,
"Transarterial Chemoembolization Monotherapy Versus Combined Transarterial Chemoembolization–Microwave Ablation Therapy for Hepatocellular Carcinoma Tumors ≤5 cm: A Propensity Analysis at a Single Center"

CVIR's **"2018 Awards for Outstanding Service to the Journal"**
were awarded to the following recipients:

- Most downloaded article in 2017: de Bruijn, A.M. et al.,
  "Uterine Artery Embolization for Symptomatic Adenomyosis: 7-Year Clinical Follow-up Using UFS-Qol Questionnaire"
- Most cited article in 2017: Chen, J.X. et al.,
  "Embolotherapy for Neuroendocrine Tumor Liver Metastases: Prognostic Factors for Hepatic Progression-Free Survival and Overall Survival"
- Best media performance in 2017: Bagla, S. et al.,
  "Cost Analysis of Prostate Artery Embolization (PAE) and Transurethral Resection of the Prostate (TURP) in the Treatment of Benign Prostatic Hyperplasia"
- Most reviews carried out in 2017: Kyung Cho, University of Michigan, United States

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