IR congress news

Don't miss the Film Interpretation Panel!

Join us for this year's Film Interpretation Panel and see how much fun an educational session can be!

Together with junior panellists senior IRs will diagnose several tricky cases. To give you a head start, we are showing you the cases in advance (pages 19-21).

The Film Interpretation Panel will take place today, 3 p.m. in Auditorium 1.

Photo Competition ends today - Cast your vote!

After the great response to the CIRSE 2008 Photo Exhibition CIRSE 2009 is featuring another photo contest. All medical delegates and industry representatives were invited to submit their best picture matching this year's theme "World Population and Friends".

Make sure to visit the exhibition located in Foyer C and cast your vote for your favourite image until 5 p.m. The winner of the photo contest will be announced at the Foundation Party.

CIRSE 2009 - Lisbon
Monday, September 21, 2009

Join us for the CIRSE Foundation Party!

Tuesday, September 22, 2009

Continuing CIRSE's long-standing tradition of ending its annual congress with a bang, the Foundation Party 2009 will be another highlight of entertainment and socialising not to be missed! A spectacular show entitled "Fado around the World" will show you that Portugal's most famous musical genre is far from its image of sad songs, but can be sang and performed in a great variety of rhythms, ranging from tango all the way to capoeira and of course samba.

Catering to all your senses, the Foundation Party 2009 will not only treat your eyes and ears, but also your taste buds with a delicious dinner including a variety of Portuguese specialties. After dinner and drinks you will have the chance to work it all off dancing until the morning hours Latin style.

To purchase tickets or pick up pre-ordered ones, please visit the Hotels and Social Events Booth in the registration area.

Jim A. Reekers
CIRSE President

Dear Colleagues,

CIRSE 2009 marks the conclusion of my term as CIRSE President. Although it is tempting to look back at all the things we have achieved in the past two years and pat ourselves on the shoulder, I would like to focus this address on the projects that lie ahead. I think that this is in the spirit of interventionists, as we tend to look forward, searching for new challenges to be tackled rather than resting on our laurels.

There are two projects which are particularly close to my heart. After laying their foundation I hope that they will be further developed and soon come to fruition:

- A new focus on research
- A European Interventional Radiology Skill Certificate

Although these two aspects seem quite different at a first glance, I think that research and training are very much intertwined, as only skilled physicians are able to do proper research and only sound research can provide us with the knowledge we need to teach the next generation of IRs.

Our plan to more actively engage in research was put into action with a first registry on closure devices. As it met with a great response, it is clear that many of you also see the need for more evidence in our specialty, and I hope that this project will be followed by many more of its kind.

The other main task for us now is to make sure that interventionists across Europe not only receive adequate training, but are also able to certify it to their hospital administrators and healthcare officials. This is why CIRSE is working on a European Certificate of Interventional Radiology – ECIR – which will allow interventional radiologists to officially document their qualifications.

I am happy to say that our society is as sound as ever. In the past I have often mentioned its strong growth, but I think that a community's strength is not only measured by its size, but most importantly by its actions and its conduct. Regarding CIRSE's actions I think we can safely say that its many projects speak for itself. Our congresses and courses are more attractive than ever, which can clearly be seen in the positive feedback from the participating physicians and industry as well as ever increasing delegate numbers. Furthermore we have developed from an association centred on a congress to a community providing services 24/7, such as our educational website www.esir.org.

Before concluding this address I would like to thank Jan Peregrin for his support as Vice President during the past two years, and wish him all the best for his presidency. I am confident that he will do an outstanding job and I look forward to his ideas and projects.

CIRSE Community continues to grow

During the course of 2008 and 2009 CIRSE has continued to expand considerably, welcoming four new Group Members to its community.

Among them are two of Europe's biggest nations; Germany and France which have, along with Hungary, decided to join forces with CIRSE at the preferential conditions offered to societies joining in their entirety. Furthermore, the South American Society of Interventional Radiology - SIDI comprising the majority of the South American continent all the way from the Rio Grande to Fireland, has become a CIRSE member, thus adding to our community's global character.

The continuous growth of the CIRSE family clearly shows the wish of interventionists worldwide to cooperate on issues that are the same everywhere; the definition of standards, furthering clinical involvement and achieving a clear profile for Interventional Radiology.

For more information on CIRSE's projects and group membership visit www.cirse.org

CIRSE Group Members


Tracheobronchial Stents

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Background
Unfortunately most patients with lung cancer present with advanced disease at the time of diagnosis. Moreover, up to 30% of patients with the disease will develop central airway obstruction because of endoluminal disease or external tracheobronchial compression (1). Critical airway stenosis may also result from post-intubation or post-tracheostomy trauma or other benign congenital, inflammatory or infectious etiology (Table 1).
Stenting may be applied for internal airway splinting to alleviate malignant or benign strictures of the tracheobronchial tree with impending asphyxia and death. Patients with advanced malignant obstructions present with chest pain, obstructive pneumonia, hemoptysis, severe dyspnea and stridor or a combination thereof, usually on the verge of suffocation. Given the limited life expectancy and poor performance status of these patients, urgent airway stenting is a sufficient and effective palliative therapy that improves their quality of life (2, 3).

Clinical and anatomic considerations
The procedure may be either palliative for inoperable primary or secondary lung or neck neoplasms encroaching, infiltrating or compressing the trachea and the main stem bronchi, or temporary for benign diseases like inflammatory and anastomotic strictures (2, 3, 4, 5). Table 1 summarises the accepted indications for placement of tracheobronchial stents in malignant and benign diseases.
The most common malignant pathology causing central airway obstruction is bronchogenic carcinoma. Intraluminal encroachment or extraluminal compression of the trachea or the main stem bronchi without involvement of the lobar branches is the best indication for stent placement (3). External airway compression by a vessel remains a definitive contra-indication because of the high risk of stent-related vessel erosion, haemorrhage and death (1).
Benign airway strictures are generally best treated surgically with appropriate reconstruction techniques. Temporary tracheal stenting is reserved for patients with severe comorbidities prohibiting open surgical repair and usually for anastomotic strictures in the lung-transplant patient population in specialised tertiary centres (1).
Notwithstanding the emergency mandated by the symptoms of imminent asphyxia, the site, the severity and length of the airway stenosis should be thoroughly evaluated with modern thin-section cross-sectional imaging and multiplanar reformatting before attempting stent placement (3). Volume rendering reconstructions of datasets acquired with sub-millimetre multidetector CT scans and virtual bronchoscopic navigation within the distal lobar branches allow for accurate treatment planning, especially in cases of high-grade strictures where the flexible bronchoscope cannot see beyond the stricture (6).

Procedure and Technique
The procedure generally involves multidisciplinary evaluation and execution by a team of interventional radiologists, thoracic surgeons and pulmonologists. A combination of rigid or flexible endoscopy and plain fluoroscopy under general anaesthesia is the safest approach for accurate stent deployment with minimal complications.
Alternatively, self-expanding metal stents may be placed under local anaesthesia and flexible bronchoscopy or even with direct transtracheal puncture (2, 3, 4).
Under routine fluoroscopy guidance, the stricture is initially manipulated with standard guidewires and catheters inserted through the working channel of the bronchoscope and avoiding excessive force and distal guidewire advancement that may cause a pneumothorax. Hydrophilic guidewires are rarely needed to transverse a malignant stricture. Direct bronchoscopic visualisation in combination with anatomic landmarks like the carina and the vocal cords are usually adequate for tracheal stenting, whereas selective bronchography with non-ionic contrast media may be employed for more accurate delineation of distal bronchic strictures.
Pre-dilation with undersized balloons is applied in cases of high-grade stenoses. Sizing of self-expanding metal stents (SEMS) is typically based on appropriate measurements of baseline CT scans and their diameter should be adequately oversized (10-20%) to optimise stent apposition and avoid migration. Balloon pre- or post-dilation should be generally exercised with caution and as necessary because of the risk of haemorrhage and perforation.
Bronchoscopy is always applied at the end of the procedure to confirm optimal stent placement and expansion and to identify and treat any sites of on-going haemorrhage.
Of note, with the exception of solely external airway compression, tracheobronchial stenting may be combined with other interventional bronchoscopic procedures, like laser resection, electrocautery, photodynamic therapy or argon plasma coagulation in order to debulk the tumour, maximise luminal gain and optimise stent expansion (1, 3, 7). In case of malignant tracheoesophageal fistulae, concomitant placement of covered esophageal and tracheobronchial stents is needed to effectively seal the fistulation tract (2).

Stents
The first airway stent applied, originally described in the 1960s, was the plastic Montgomery T-tube, which has a side-arm and requires a tracheostomy for insertion (1, 2). The first silicone plastic stent, developed by Dumon and inserted without the need for tracheostomy, was a milestone in interventional bronchoscopic therapies and is still in clinical use (1). Modern silicone stents are inserted under rigid bronchoscopy and may be removed as necessary [Dumon (Endoxane, Novatech SA, France), Hood (Hood Corp, Pembroke, USA), Dynamic & Polyflex (both Rusch AG, Kernan, Germany)]. However, silicone stents completely cover the respiratory epithelium interrupting mucociliary clearance and suffer from increased rates of secretions' retention (up to 15%) and migration (up to 20%) (2, 3, 7).
Modern airway stents dedicated for malignant disease are typically made of self-expanding metal alloys and may be uncovered or covered [Ultraflex & Wallstent (both Boston Scientific, Natick , MA, USA), Alveolus (Alveolus Inc. Charlotte, NC, USA)]. The main advantages of SEMS include their easy insertion through an endotracheal tube or even percutaneous transtracheal puncture under combined bronchoscopic and fluoroscopic guidance and their conformability to the airway anatomy with reduced risk of migration (3).
Uncovered SEMS maintain patency and perfusion of segmental branches if placed in the lobar bronchi and gradually become epithelialised allowing for effective drainage of respiratory cilia. However, they cannot be removed because they become embedded in the respiratory wall and inherently suffer from progressive tumour ingrowth and granulation tissue that may compromise luminal patency (8).
Covered tracheobronchial stents are preferentially placed in the trachea prohibiting tumour ingrowth, whereas uncovered SEMS are chosen in the main stem and lobar bronchi to avoid obstructive atelectasis of segmental branches. Balloon-expandable stents like the Gianturco and the Palmaz stent are no longer used in the airway tree because of their inflexible design, the risk of migration and expectoration during coughing and the high rate of hemorrhagic complications (2, 3, 5).

Clinical Outcomes
Technical success rates are very high 98%–100%), but clinical success rates are somewhat lower, at the level of 88%–100% for benign conditions and 82%–92% for malignant disease (3). Over 90% of patients with malignant central airway obstruction will experience relief of symptoms, and in about 10% of them the improvement will be delayed occurring within 1-2 weeks after stent placement (2). Furthermore, relief of central airway obstruction may allow for resolution of obstructive pneumonia so that the patient may be eligible for chemotherapy and further oncological therapy may be optimised (1). Stent placement in the setting of post-lung transplantation strictures has a reported 83% rate of immediate improvement of dyspnea (1).

Complications
Similar to applications in other hollow organs, uncovered stents mostly suffer from neoplastic tissue in-growth and covered ones from migration. Stent-related complications are more frequently encountered in the long-term treatment of patients with benign airway stenoses and include decreased mucociliary clearance and sputum impaction, development of granulation tissue at the stent edges, stent migration and fracture (3, 5). Development of obstructing granulation tissue after permanent tracheal stenting is reported in up to 28% of patients with benign strictures, but may be successfully treated with laser therapy and repeated balloon angioplasty or stenting. Therefore, treatment of benign disease should be restricted to retrievable plastic or covered metal stents.
Bioabsorbable stent devices with elegant biomechanical properties are currently being developed and will definitely play an important role in the future. Of note; both, plastic and covered SEMS suffer from bacterial colonisation and biofilm formation, though these do not always result in infection (5, 7). Other stent-related complications are stent fracture, stent expectoration and patient intolerance requiring early stent removal (5).

Conclusion
Tracheobronchial stenting is a well-established palliative therapy for patients with central airway obstruction due to inoperable advanced neoplastic disease with minimal serious complications. The interventional radiologist should be an integral member of a collaborative multidisciplinary team in charge of those critically ill patients.

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Table 1: Indications for tracheobronchial stenting (1, 2, 3)

Malignant causes	Benign causes
Inoperable malignancy causing intrinsic critical airway stenosis or obstruction, or severe extrinsic airway compression	Post-infectious (Tuberculosis, histoplasmosis)
Tumor in-growth or over-growth after previous stenting	Post-intubation or post-tracheostomy tracheal stenosis
Adjunct to bronchoscopic tumor debulking to maintain luminal patency	Post-surgery anastomotic strictures (Lung-transplantation, sleeve resection)
Malignant tracheoesophageal fistula	Tracheobronchomalacia
Relief of obstructive pneumonia to allow other palliative oncological therapies	Congenital tracheal stenosis

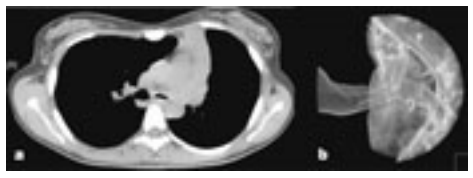

Fig.1: Bronchogenic carcinoma. (a) Axial CT and (b) transparent volume-rendered view of the left main stem bronchus.

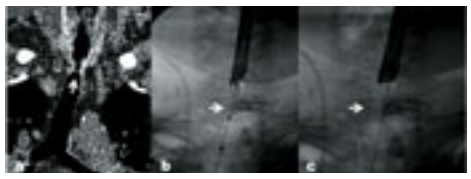

Fig.2: Tracheal stricture. (a) Curviplanar reformatted CT view of the trachea and (b, c) tracheal stent placement. The radiopaque marker was superimposed on the patient's skin centered on the stricture.

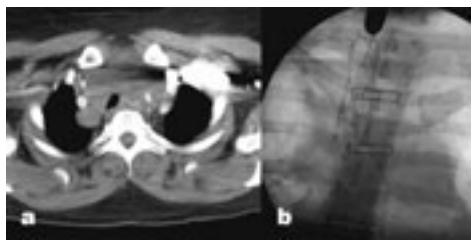

Fig.3: Severe external compression of the trachea from extensive mediastinal lymphadenopathy. (a) Axial CT view and (b) stent placement under rigid bronchoscopy and fluoroscopic guidance. The upper marker is centered on the stricture and the lower points to the level of the carina. Two overlapping covered stents were placed.

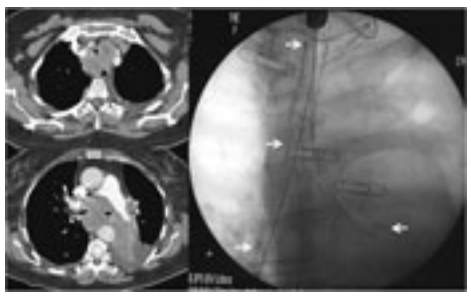

Fig.4: Extensive central airway stenosis involving the trachea and both main stem bronchi (left panel). Final fluoroscopic image shows a covered stent in the trachea and two uncovered metal stents placed in the main stem bronchi with an inverse Y configuration.

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BTK in Diabetics

Thomas Rand
Department of Interventional and Diagnostic Radiology
General Hospital Hietzing
Vienna, Austria

Don't miss it !
BTK in Diabetics
Special Session
Monday, September 21, 08:30-09:30
Auditorium 8

Critical limb ischemia in diabetic patients is a dramatic event in the course of a multifactorial disease. According to epidemiological investigations this problem will further increase due to the prognosticated rise in the number of diabetic patients expected in the next decades. Diabetic patients with CLI (critical limb ischemia) suffer from an enormous load of comorbidities, and if it comes to amputation further dramatic physical and psychological burden has to be managed.

Generally lack of conduit, bad or unclear run-off at the distal outflow site and other contraindications for surgery appear in this patient group. Therefore the successful and fast approach by endovascular means have made endovascular options the treatment of choice. Even if surgery is potentially a good technique with good results, the benefit/risk ratio usually seems too low for this patient group. Knowledge of the variety of percutaneous endovascular treatment options of BTK lesions is therefore mandatory for successful management of this patient group.

Endovascular options
Regarding endovascular techniques, a variety of treatment options are available. Driven by the urgent need for innovative treatment modalities, particularly in the last 5 years, a variety of techniques and innovative devices have been investigated. Starting from plain balloon angioplasty, subintimal recanalisation, cryoplasty, cutting ballon techniques and finally all variety of stents, such as bare metal stents, active and passive coated stents as well as balloon and self expandible stents have been evaluated and can be used sufficiently.

Studies
The use of balloon angioplasty for the recanalisation of infrapopliteal arteries has been established during the last decade. With the introduction of low profile, high pressure balloons in a vast variety of lengths it has become possible to re-canalise even longer and segmental lesions. Subintimal recanalisation has found its place within the BTK techniques as well. Innovative devices, such as cryoplasty or cutting balloon techniques have also been found feasible for application in the lower leg. The most innovative technique, coated balloons, is recently under investigation.

Several trials have been established regarding the use of stents for the treatment of infrapopliteal lesions, such as passive coated stents (PCS), balloon expandable stents, bioabsorbable stents, balloon expandable drug eluting stents (DES) and self expanding nitinol stents. All stents demonstrated their potential when used in CLI patients using an infrapopliteal approach.

Biondi et al. comprised all recent data from a total of 640 patients in a meta analysis of 18 studies, providing important insights on early and mid-term outcomes following infra-genicular stenting for BTK disease. Specifically, they found that bail-out stenting (i.e. performed for suboptimal results of balloon-only PTA) with either balloon-expandable or self-expandable stents was associated with satisfactory angiographic results with patency and clinical outcomes up to a median of 12 months of follow-up.

Sub-analyses were also performed, focusing more precisely on device type and comparing balloon vs. self-expandable devices and bare-metal vs. drug-eluting stents. Such interaction analyses showed that balloon- and self-expandable stents perform similarly at early and mid-term, at least as when employed in the included studies (i.e. avoiding joint segments or pedal vessels). In addition, the available data suggest the superiority of sirolimus-eluting stents in comparison to bare-metal or paclitaxel-eluting stents, even if such analyses should be viewed mainly as exploratory.

Clincial outcome
The observations in most current studies mainly concentrate on the angiographic and numeric data, such as restenosis rate, late lumen loss due to intimal hyperplasia and long term patency. Also, dedicated devices and stents for below the knee (BTK) applications have only recently become available and data regarding the use of stents in the infrapopliteal arteries is still limited. General limitations of BTK studies are relatively small numbers of patients and high drop out rates, which result in decreased statistical power. Therefore clinical data is also limited and the leading question that remains is if stents in an infrapopliteal approach might have an effect on the clinical outcome of patients and if such stents might reduce the amputation rate in these patients.

Angiographic results vs. clinical data?
Regarding angiographic data alone, a discrepancy between clinical data and angiographic data might indeed exist, indicating that angiographic results alone do not always reflect the clinical status. In our own observations we found the use of stents for endovascular therapy clinically most effective within the first 6 months, where stent application might play an important role to improve clinical conditions. Later on the clinical effects of stents and PTA seem to equalize.

The general clinical approach in the treatment of critical limb ischemia is early ulcer healing. This, however, is induced by a first pass effect, and might even overcome a secondary or midterm deterioration of the vascular situation. Our considerations underline the meaning of the first pass effect and we suppose that in a critical situation a short term revascularisation might overcome ischemia and later a diminished flow might be enough to maintain vitality without the need of permanent patency.

Future concepts
Below the knee (BTK) peripheral artery disease is characterised by a multi-level type of peripheral artery disease involving the infrapopliteal arteries. The endovascular approach is made even more complex by the fact that BTK disease in diabetic patients usually ends up being very diffuse with a high prevalence of long total occlusions. Therefore the endovascular approach must include a variety of options, including all techniques of PTA as well as stenting and results in an individual approach to each patient. The IR has to offer a broad knowledge of these techniques. Further development in this fast growing field of endovascular therapy has to be expected and it is our duty to learn and weigh up all forms of innovative procedures.

The basic goal of treating CLI in diabetic patients remains very simple; to reduce amputation rates and improve clinical status as much as possible. An open minded early approach and forced application of endovscular techniques will definitely help us reach this goal.

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15. Giuseppe G. L. BIONDI-ZOCCAI,1 Giuseppe SANGIORGI,2 Marzia LOTRIONTE,3 Andrew FEIRING,4 Philippe COMMEAU,5 Massimiliano FUSARO,6 Pierfrancesco AGOSTONI,7 Marc BOSIERS,8 Jan PEREGRIN,9 Oscar ROSALES,10 Antonio R. COTRONEO,11 Thomas RAND,12 and Imad SHEIBAN, MD1 Infra-Genicular Stent Implantation For Below-The-Knee Atherosclerotic Disease: Clinical Evidence From An International Collaborative Meta-Analysis On 640 Patients. J Endovasc Ther. 2009 Jun;16(3):251-60.

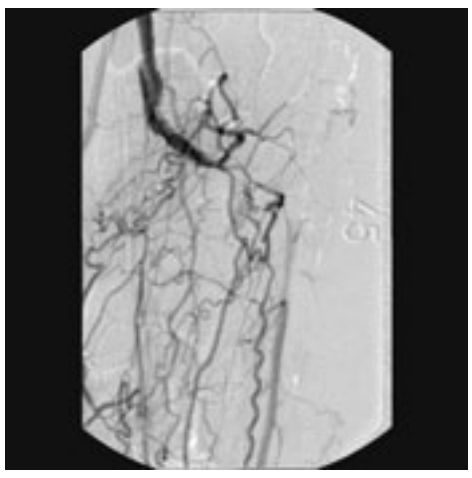

Fig.1a: Occlusion of the ATA as single infrapopliteal vessel in CLI

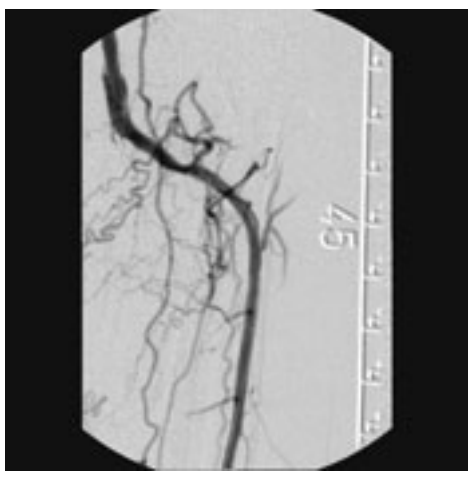

Fig.1b: Stent application

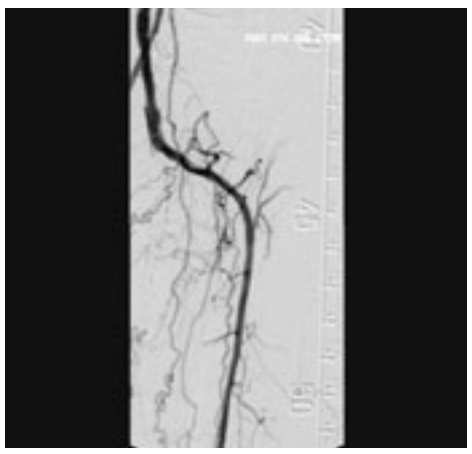

Fig.1c: Recanalisation after PTA and Stent application

Table 1a: Clinical evaluation of patients treated with PTA vs Stent after 3 months. Data from INPERIA II

Total	PTA (32)	STENT (33)	p-value
Clinical improvement	62,5 % (20)	81,8 % (27)	0,008
Stable Disease or Clinical worsening	37,5 % (12)	18,2 % (6)	n.s
ABI Index	0,7 ± 0,3	0,9 ± 0,1	n.s

Table 1b: Clinical evaluation of patients treated with PTA vs Stent after 9 months. Data from INPERIA II

Total	PTA (24)	STENT (19)	p-value
Clinical improvement	58,3 % (14)	47,4 % (9)	n.s
Stable Disease or Clinical worsening	41,7 % (10)	52,6 % (10)	n.s
ABI Index	0,8 ± 0,3	0,8 ± 0,1	n.s

Data by Rand et al., under revision

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Foundation Course
Monday, September 21, 10:00-11:00
Auditorium 1

Introduction
There are a number of ways to maintain nutrition in patients who cannot tolerate oral food. These include:

- Parenteral feeding via a central venous line
- Enteral feeding via a nasogastric tube or nasoenteric tube
- Gastrostomy (surgical, endoscopic gastrostomy (PEG) or radiologic gastrostomy)
- Direct jejunostomy

Parenteral feeding is useful in patients with short gut syndrome or patients with an inactive gut, but is more commonly used as a short term nutrition boost in patients who have lost significant weight before embarking on major surgery. Parenteral feeding is associated with venous stenosis, occlusion and infection and therefore enteral feeding is preferred, if possible. The advantages of enteral feeding over parenteral feeding include the fact that with enteral feeding, gut integrity and gut mass is maintained, gut stasis is prevented, there is better metabolic handling of food, it is less expensive and has less infectious complications

Nasogastric or nasoenteric tube feeding is suitable for patients who require feeding for less than thirty days. After this time period patients are at risk of developing oesophageal stenosis. If feeding is required for more than thirty days, a gastrostomy procedure is required. Surgical gastrostomy has been performed since the eighteen hundreds, but is now in decline, due to the development of percutaneous endoscopic gastrostomy (PEG) and percutaneous radiologic gastrostomy (PRG).

The PEG technique involves the placement of a gastrostomy tube with the aid of an endoscope. The stomach is first transluminated with the endoscope, which defines the point of puncture for gastrostomy tube placement. The tube is then either placed by a push or pull technique.

Indications
The main indications for enteral feeding include patients with swallowing disorders such as those with stroke, multiple sclerosis or motor neuron disease, patients who have increased nutritional requirements such as those with cystic fibrosis and burn patients or patients with upper GI tract obstruction such as patients with oro-pharyngeal or laryngeal cancer. Other indications are rarer. In terms of contraindications colonic interposition, gastrectomy and gastric varices are absolute.

It is also important to consider whether or not the patient's demise is imminent. There is not much point in perfroming a PRG in patients who are likely to die in a few weeks. Relative contraindications include partial gastrectomy, coagulopathy and ascites. Note: if a gastrostomy tube is to be placed in patients with ascites, the ascites will need to be regularly drained to prevent migration of the tube out of the stomach.

Percutaneous Radiologic Gastrostomy
There are a number of techniques to place radiologic tubes. Fluoroscopy is the mainstay of image guidance. A nasogastric tube is inserted into the stomach for stomach inflation during the procedure. This is the key step in the procedure, in that gastric inflation needs to be maintained during the procedure. A gastropexy (fixing the stomach to the anterior abdominal wall) is performed to form a seal around the gastrostomy tube. These are usually performed with T-fasteners (BALT or Kimberly Clark). After the gastropexy has been performed, the stomach is punctured in the centre of the gastropexy area and a stiff guidewire inserted into the stomach. The tract is dilated and a tube placed.

Current tubes available for radiologic gastrostomy are either derivations of abscess drainage catheters or Foley catheters. These are generally inadequate for long-term feeding. However, they are simple to place. Laterally, interventional radiologists have moved away from placing these tubes and have moved either towards primary placement of button type gastrostomy tubes (Mic-Key, Kimberley Clarke or Corflo Cubby, Corpak) or placement of PEG tubes.

PEG tubes can be placed by interventional radiologists without the use of an endoscope. These are more robust and associated with a much better long-term patency. They also have better fixation devices, so that they do not dislodge easily. The rate limiting step with this procedure is cannulating the GE junction from the stomach. This can be achieved by either puncturing the stomach from the anterior abdominal wall and cannulating the GE junction with an angiographic catheter and hydrophillic guidewire or putting an angiographic catheter and guidewire through the gastroesophegeal junction from the mouth and using a snare to achieve a through and through access. Once a through and through access from the mouth to the anterior abdominal wall is created, a pull type gastrostomy tube can be pulled from the mouth through the oesophagus and stomach and out the anterior abdominal wall to create a PEG.

The placement of gastrostomy buttons is a novel technique for gastrostomy. Gastrostomy buttons are preferred by patients, as they are flush with the skin. They are designed for insertion in mature tracks, but can be inserted de novo into immature tracks. T-fastener gastropexy is mandatory. The measurement of track length is also mandatory to devise a correct button length. A kit is provided by one company (Kimberely Clark, Fig. 1) which contains all the equipment necessary for button placement.

Alternatively, a homemade kit can be made up, using an angioplasty balloon to measure the track length and also dilate the track. The button can then be placed over a stiff guidewire, using an inner small fascial dilator to help guide the button over the wire (Fig. 2). In the Kimberley Clark kit, a telescoping dilator with a peel-away sheath, T-fasteners and tract measuring balloon are all included.

Results
Technical success for PRG approches 100% compared to 97% - 98% for endoscopically placed PEG tubes. However, the rate of blockage and dislodgement is much higher for the old type radiology gastrostomy tubes (Table 1).

Major complications such as aspiration, peritonitis, perforation, haemorrhage and major wound sepsis occur in approximately 6% of radiologic gastrostomy tubes compared to 10% with PEG tubes and 20% with surgical tubes (Table 2). Minor complications such as dislodgement and superficial wound infection or pain at the site occur much more frequently with radiologic tubes than with PEG tubes (Table 3).

Gastrojejunostomy
We perform gastrojejunostomy when there is a history of reflux, hiatus hernia, gastroparesis or history of aspiration. The key step in gastrojejunostomy is to angle the puncture of the stomach towards the pylorus to facilitate cannulation of the pylorus with a hockey-stick catheter and hydrophillic wire. A gastrojejunostomy tube can then be placed in the jejunum, or indeed a gastrojejunal button can be used (Kimberely Clark)

Radiologic, surgical and endoscopic tubes can also be converted to gastrojejunal tubes by interventional radiology. The key step in these procedures is to insert a peel-away sheath into the stomach to redirect the track towards the pylorus.

Difficult Access
Occasionally CT ultrasound guidance may be necessary to access the stomach. Generally, the indications for CT/ultrasound guidance are patients with complete oesophageal obstruction, kyphoscoliosis or partial gastrectomy. The stomach can be inflated using a percutaneous needle with a second access used for gastrostomy tube placement. I emphasise, however, that CT/ultrasound guidance is rarely needed.

Conclusion
Interventional radiologists can now offer primary button gastrostomy tube placement, PEG tube placement or gastrojejunal placement. I believe that this places interventional radiologists in a unique position in providing enteral nutrition. A regular screeing room can be used for gastrostomy and the procedure takes approx 30 mins. Is should be a routine IR procedure in all IR departments.

Table 1: Complications

Author	Pat	Success (%)	Complications (%) Major	Minor	Mortality (%)
O'Keeffe	100	100	0	15	0
Saini	125	99	1.6	9.5	0
Halkier	252	99	1.6	4.4	0.8
Hicks	158	100	6	12	2
Bell	519	95	1.3	2.9	0.4
Ryan	316	99	0.9	3.2	0.3

Wollman et al. Radiology 1995;197:699

Table 2: PEG vs PG

Method	Pat	Success (%)	Complications (%) Major	Minor	Mortality (%)
PG	837	99.2	5.9	7.8	0.3
PEG	4194	95.7	9.4	5.9	0.5
Surg	721	100	19.9	9.0	2.5

Table 3: Radiologic PEG/PIG

	50 PEG (%)	50 PRG (%)	60 RadPEG (%)
Technical Succ	98	100	100
Replacement	12	20	0
Infection	18	2	3.3
Aspiration	10	0	3.3
Blockage	0	10	0

24 radiologic PEG in failed PEGS

Endoscopy detected peptic disease in 21%
- *Laasch et al. Clin Rad 2003;58:398-405*

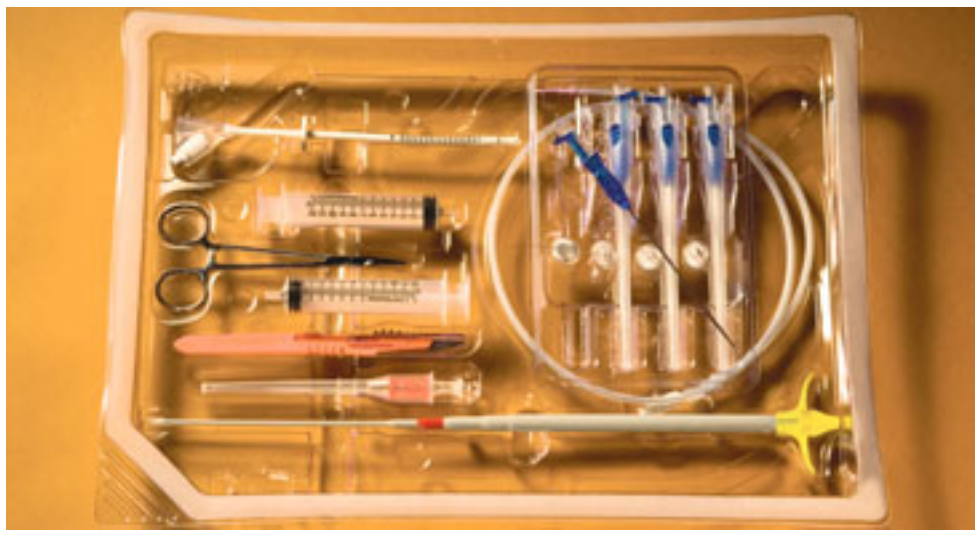

Fig.1: Kimberly Clark gastrostomy button set containing T fasteners, track measurement balloon and telescopic dilator with peel-away sheath. Note the gastrostomy buttons come in different lengths (1.5 to 5 cms) and are chosen after track measurement.

The History of Interventional Radiology in Portugal

Paulo Vilares Morgado
CIRSE 2009 Host Committee Chairman

Vascular and Interventional Radiology in Portugal dates back to the late 1920s, when the most innovative and productive developmental period in diagnostic radiology took place. This was due to a group of brilliant Portuguese physicians who were responsible for the development of diagnostic angiography, together with the introduction of the first organic radioopaque contrast medium by the young American urologist Moses Swick, synthesized by Binz and Rath in Berlin, and thanks to Werner Forssmann's heroic catheterization of his own heart in Berlin in 1929.

The Portuguese School of experimental and clinical investigators was led by the 1949 Nobel Prize Winner in Physiology and Medicine Egas Moniz, a distinguished inaugural professor of neurology and psychiatry at Lisbon University.

It was Moniz's goal to develop cerebral arteriography to localize cerebral tumours and to treat neurological disorders by intra-arterial injections. He planned a great number of experiments on monkeys, rabbits, dogs and human cadavers in an attempt to discover a safe intra-arterial radiological contrast agent and a suitable technique for clinical cerebral arteriography. His first successful human clinical carotid arteriogram was performed on June 28th, 1927 using 25% sodium iodide. He subsequently utilized colloidal thorium dioxide, but later abandoned it due to its delayed carcinogenic properties, replacing it with the new organic iodine media introduced by Swick.

Moniz's success stimulated his talented clinical colleagues to extend the new arteriographic technique into new territories. Reynaldo dos Santos, Augusto Lamas and J. Pereira Caldas introduced aortography and peripheral arteriography; Lopo de Carvalho, Almeida Lima and Egas Moniz developed pulmonary and cardiac angiography;

Hernani Monteiro developed lymphography; João Cid dos Santos introduced clinical peripheral phlebography; A. Sousa Pereira developed abdominal and portal venography and N. Aires de Sousa conceived the technique of angiokymography and contributed to the Portuguese School of angiography by his remarkable work on microangiography.

These researchers were not only interested in the purely diagnostic aspects of their newly created science, but also in the therapeutic potential of intra-arterial therapy. This was a truly remarkable and probably unique record of medical innovation by a small group of brilliant investigators from the Portuguese school who within a few years established an entirely new dimension of vascular and organ imaging in anticipation of Interventional Radiology.

To my knowledge the first PTA in Portugal was performed in Lisbon in 1981. Many other hospitals followed this practice in the consecutive years with the first stent deployed in 1987. The first TIPSS procedures were done in 1992 in Coimbra and Lisbon. The first uterine fibroid embolization on Portuguese soil was performed in Lisbon in 1996, the first carotid angioplasty was carried out in Coimbra in 1997. In 1999 the first abdominal aortic endoprothesis was implanted in Lisbon. Oporto and Coimbra followed one year later.

In this context I would also like to mention the First International Symposium on Intervention Radiology that was held at Algarve in 1979, M. Martins da Silva and J.A. Veiga-Pires being the chairmen of that event.

As you can see, Portuguese interventional radiologists have been in the forefront of IR developments in Europe in many aspects and I am confident that the new generations will achieve the fulfilment of their scientific ambitions, their spirits being lifted by the memory of Egas Moniz who achieved so much with so few resources.

The number of hospitals practicing Interventional Radiology has increased in recent years despite the more heavy duty procedures mostly being carried out in specialized General and University hospitals.

At the 1995 General Assembly of the Portuguese Society of Radiology and Nuclear Medicine (SPRMN) the Portuguese Section of Vascular and Interventional Radiology (SRVI) as well as the Magnetic Resonance Imaging and Pediatric Imaging Sections were established. Today the SRVI has more than one hundred and sixty active members. It is a well established section organizing thematic meetings, case-based discussions, hands-on workshops as well as a regular general assembly. It actively participates in the biennial meeting and other scientific activities organized by the SPRMN.

We are extremely happy about CIRSE's decision to come back to Portugal in 2009 thirteen years after the CIRSE's Annual Meeting in Madeira. We feel it is time to give something back to CIRSE and are therefore considering, among other things, becoming a CIRSE Group Member. We feel that this will be mutually beneficial to both CIRSE and the SRVI and as a result to all Portuguese interventional radiologists.

CardioVascular and Interventional Radiology
The official journal of the Cardiovascular and Interventional Radiological Society of Europe
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Israeli Society of Interventional Radiology (ILSIR)
Japanese Society of Angiography and Interventional Radiology (JSIR)
Russian Society of Interventional OncoRadiology (SIOR)

Don't miss it !
Venous Disease
Special Session
Wednesday, September 23, 08:30-09:30
Auditorium 6

Foam/Laser/RF for varicose veins (Why we should get involved)

David West
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Varicose veins are a very common problem affecting up to 40% of the adult population in the Western world. Their management throughout the 20th century was patchy to say the least and remained so despite the move away from treatment largely by general surgeons to management solely by vascular specialists. Over the last decade several new, office based, local anaesthetic, ultrasound guided catheter techniques have been developed which are very popular with patients due to reduced pain, early return to normal activities, absence of cuts and scars, lower risks, good symptom relief and cosmetic results as well as low recurrence rates.

The poor results of traditional surgery with high recurrence and low patient satisfaction can be attributed to several factors. Firstly, even the best surgical technique in the best hands in many cases inevitably results in neo-vascularisation and recurrence. Secondly, varicose veins were often perceived as less important, less demanding and less interesting than arterial problems. As a consequence of this many varicose vein operations were commonly delegated to the most junior members of the surgical team with little or no supervision. Thirdly, preoperative treatment planning has often been suboptimal with very few vascular surgeons undertaking a duplex ultrasound scan themselves.

With the advent of effective image guided catheter techniques for the management of venous insufficiency we as interventional radiologists are falling into the trap of replicating the past attitudes of surgeons towards venous disease. Aortic aneurysms and arterial insufficiency are viewed as sexy, important and challenging, whereas varicose veins and venous insufficiency in general are regarded as boring, easy and unimportant.

There is almost an embarrassment among some who think of varicose veins as just a cosmetic vanity issue rather than a genuine medical problem. Although many patients do just find them ugly, the small proportion of a massive population who have serious symptoms, ulceration and dangerous bleeding still mean that the overall impact on the health of our nations and the associated costs exceeds that of peripheral arterial disease.

These attitudes are compounded by the potential turf battles in healthcare systems where personal income is involved. Many vascular surgeons rely on "veins" to pay private school fees and exotic holidays. To avoid such turf battles the majority of interventional radiologists have left the management of venous insufficiency to their surgical colleagues justifying their unwillingness to enter the field to themselves and others by the "facts" that such work is boring, easy and unimportant and in any case they have too much else to do and hence no time. These are just the same attitudes which led to such poor surgical results in the past. There should be no need to be concerned about turf here; there will always be plenty of venous work to keep us all busy.

With a widespread shortage of interventional radiologists to provide an adequate cover for emergencies we cannot afford to turn away high volume elective work on the pretext that we have too much to do already. This may help in the short term, but in the long term we will have insufficient income to pay for the numbers of interventional radiologists required to provide 24/7 emergency care. To survive as a specialty it is widely recognised that we need to morph into "proper" clinicians with outpatient clinics and properly assess and follow up the patients we treat. A venous clinic is an ideal route into such clinical interventional radiology, enabling referral patterns with primary and secondary care physicians to be established as a springboard for other conditions.

On top of all this is our responsibility to patients. Without a shadow of a doubt those trained and experienced in the use of ultrasound to make diagnoses and to guide needle punctures and wire and catheter manipulation through often hostile vascular territory are those best able to provide safe and effective catheter based venous therapy. We as interventional radiologists have just those skills in abundance and we owe it to patients to offer these treatments and be at the forefront of service provision and future developments. In addition it is only us who have the experience of fluoroscopically guided embolisation which many patients require.

In an IR venous practice all patients can be treated safely and effectively without surgery. This is what they want and this is what they get. Compare that to the online patient information on varicose veins from the Vascular Society of GB and Ireland (mainly vascular surgeons) which claims that the new non-surgical treatments are only suitable for 70% of those with no previous surgery and only 20% of those who had had previous surgery.

I can only assume that these figures are a result of the practitioners avoiding difficult cases (tortuous, short and spasm prone veins, obese patients, etc.). Such cases are just those which interventional radiologists find an enjoyable challenge. Certainly the technical skills required to undertake venous intervention successfully are just as demanding as those required for arterial work.

Effective management of venous insufficiency requires detection of all sources of reflux usually by duplex ultrasound scanning and then obliteration of the reflux starting proximally and moving distally. The most common veins which contribute and require ablation are internal iliac, ovarian, truncal (great and small saphenous, anterolateral thigh) perforators and branch varicosities. The majority of patients require truncal ablation, best dealt with using thermal methods and obliteration of branch varicosities by foam sclerotherapy or microavulsions.

Foam sclerotherapy
Sclerotherapy using intravenous injections of liquid sclerosants like STD and polidocanol has been used for the last 50 years or so but waned in popularity towards the later part of the 20th century following the publication of a 10 year RCT showing high recurrence rates. More recently developments using foamed liquid and gas combinations and ultrasound guidance of the injections have led to something of a resurgence of interest.

Despite this, however, the results of foam sclerotherapy for truncal incompetence are significantly worse in most hands than surgery, laser or RF and most practitioners reserve foam sclerotherapy for the treatment of branch varicosities after truncal ablation. For this application it is very effective. The foam is made by mixing 1 part sclerosant with 4 parts air or CO2/oxygen mix, using the Tessari method of rapid injection from one syringe to another through a part closed 3 way tap. This is then injected into the varicosities and massaged through the veins followed by two weeks of class 2 compression hosiery. One treatment session is usually sufficient, but it can be repeated if necessary. Complications are rarely serious, but there is a very small risk of cerebral embolus leading to visual disturbance and potentially a full blown stroke. Skin staining is common, but usually resolves with time. Phlebitis can occur and occasionally requires aspiration of retained coagulum.

Thermal ablation
This involves the use of an intravenous catheter to deliver thermal energy either by way of laser light (EVLA) or RF (RFA). Both techniques are guided by ultrasound and involve the insertion of a catheter into the incompetent truncal vein at the point where the lowest varicose tributary arises.

This is either done Seldinger style or through a vascular sheath. The catheter is advanced to just below the superficial/deep vein junction and in the case of laser a fibre is threaded up and left protruding from the end of the catheter. Local anaesthetic is injected around the vein along its length. The laser fibre or RF catheter is then withdrawn down the vein as energy is delivered at a rate dependant on size of vein. A compression stocking is applied and worn for 2 weeks. Injections or avulsions of the branch varicosities are undertaken either at the time of truncal ablation or more commonly at follow up after 6 weeks.

There is much discussion about the relative merits of RF or laser, most of which is of dubious scientific basis and largely commercial in origin. The major companies have invested hugely in protecting and growing their markets resulting in much mutual criticism and some overegging of their own claims. There is good evidence that both the major thermal techniques work remarkably well with few side effects.

The actual treatments are very well tolerated and virtually pain free. Laser does cause some minor pain usually around 5 days, but is below 2 on a 1-10 pain scale. RF causes even less pain. Laser causes more bruising than RF, but it has usually gone by 2 weeks which is when the stockings are removed. More serious side effects with laser are virtually unknown, but RF does have a higher and significant incidence of DVT, nerve injury and skin burns. Laser's great advantages are its low inherent cost (a simple bare fibre) and its small size and flexibility which enable it to effectively ablate virtually any vein however tortuous or however much in spasm. RF has limitations with treating short segments and accessing tortuous and narrowed veins.

Capital equipment costs are similar between the two and most manufacturers will loan a machine free of charge in the hope of making a good profit on the consumables. Most manufacturers (laser and RF) insist on their own kits being used on their machines. The most cost effective option is to choose a generic laser and shop around for the best deal on fibres. Don't be put off by the RF manufacturer's claims that laser regulations are difficult to abide by. At most you will need to cover up windows and mirrors with blinds, have a lock on the door and access to a laser protection advisor which most hospitals already have.

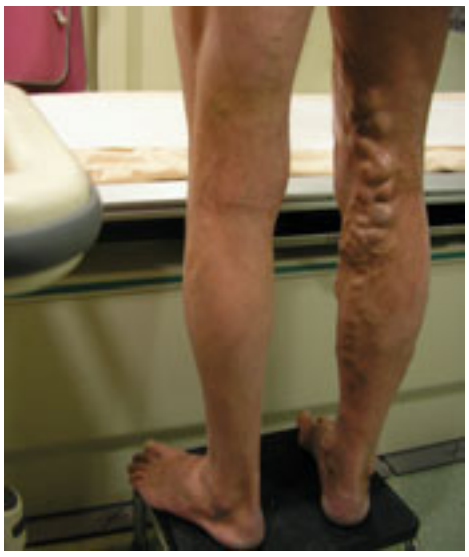

Fig.1: Gross varicose veins before treatment

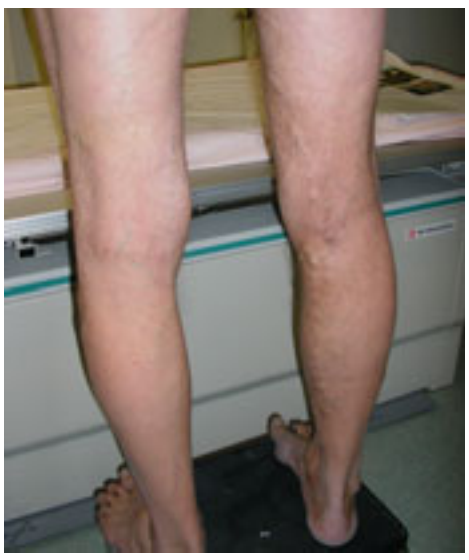

Fig.2: The same patient after EVLA

Don't miss it !
AAA
Special Session
Monday, September 21, 10:00-11:00
Auditorium 6

EVAR - Updates on Results


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Nearly 2 decades ago the deployment of the first endovascular graft in an abdominal aortic aneurysm by Parodi ushered in a new era in the treatment of an extremely deadly vascular condition. Since then, there has been significant evolution in both, devices and technique with increasing amounts of data available to the lineated outcomes in various types of procedures. More recently both, devices and operators have begun pushing the boundaries of what has been traditional endovascular aneurysm repair (EVAR). Additionally, there has been a steady increase in the utilization in EVAR, likely associated with a decline in the mean annual number of AAA ruptures and mortality for intact and ruptured AAAs (1).

In the United States, according to Medicare Part B data sets, the number of EVAR cases has shown 162% growth from 2001 to 2006 (11,028-28,937), while surgical AAA repairs decreased by 51% (31,965 to 15,665) during the same period of time. The overall frequency of treatment of AAA has remained stable (2). This trend has also shown to be more and less similar in European studies (3). Currently, based on manufacturer provided data, 64% of AAAs in the United States and 40% in Europe are being treated with EVAR.

EVAR vs. Open Repair
A number of historic trials comparing EVAR to open surgery (DREAM & EVAR 1) and one randomised trial comparing EVAR to no intervention (EVAR 2) in "unfit" patients have already been completed (4-6). DREAM and EVAR 1 trials clearly demonstrated an early perioperative mortality benefit for EVAR. According to the EVAR 1 trial, blood product use and length of hospital stay also favoured EVAR. Although the trend towards an early mortality advantage for EVAR was lost within 2 to 4 years in these studies, aneurysm related death remained less (3.5% EVAR vs. 6.3% OS) than OS (5).

The Open Versus Endovascular Repair (OVER) trial, which is ongoing in the United States, is a 9 year old study that began in 2002 comparing EVAR with standard open surgery using a multi-centre randomised trial through the Department of Veteran Affairs (VA). The researchers enrolled 881 patients and randomly assigned 444 patients to undergo EVAR for aneurysms ≤5 cm and 437 patients to open repair. Its primary results which were announced this year at the Society for Vascular Surgery Meeting (Denver 2009, OVER: EVAR associated with lower post-procedural mortality. Cardiology Today: June. 2009) showed that EVAR is associated with less post-procedural and 30-day mortality than open repair (0.2% EVAR versus 2.3% OS; P=0.006), while mortality was lower for both procedures than in earlier trials. Secondary procedures and abdominal aortic aneurysm-related hospitalisations and claudication were more frequent after EVAR, but not significant according to the author, Frank A. Lederle, MD (7).

Yet, based on current data, EVAR has proven its superiority in short term results and showed at least comparable long term outcomes to OS, which seems convincing to be considered as the first treatment in appropriate candidates. This has been reflected in large administrative data bases in the United States, which have documented a trend towards AAA repair using EVAR technique (2).

EVAR & Small Aneurysms
A few retrospective studies suggested that the outcomes after EVAR are better in patients with smaller (4-5 cm) vs. larger (>5.5 cm) aneurysms (8-10). This has advocated the idea that EVAR might actually improve survival in patients with small aneurysms while previous randomised clinical trials (ADAM and UKSAT) failed to show such benefit in early open surgical repair (11). Two randomised clinical trials, one in Europe (CAESAR) and one in United States (PIVOTAL), are ongoing to provide objective evidence to guide the use of EVAR for small AAAs (12).

EVAR & Ruptured Aneurysms
Use of EVAR for ruptured AAAs (RAAA) has also shown promise, yielding survival results comparable with open repair for rupture (13). A recent study on National Inpatient Sample (NIS) in the United States showed that from an estimated 27,750 hospital discharges for RAAA between 2001 and 2006, 11.5% were treated with EVAR. Additionally, despite the relatively insignificant change in incidence of aneurysmal rupture, the percentage of patients undergoing EVAR for RAAA increased from 5.9% in 2001 to 18.9% in 2006. Furthermore, the overall crude mortality following EVAR and OR for ruptured AAA was 31.7% and 40.7% respectively while these mortality rates were significantly lower at the centres with high annual volume of AAA repairs (20% vs. 37%), suggesting that the experience of the centre is a strong predictor of survival (14).

Another literature review study showed an overall 94.9% technical success rate in 531 patients undergoing EVAR for ruptured aneurysm and a short-term mortality of 30.2% with 4.9% mortality reduction for each 10% increase in the proportion of cases done endovascularly (15). Whether the results of this study are due to selection bias is open to debate. Yet, well defined criteria of EVAR treatment for ruptured aneurysms and randomised trials in this setting are needed.

EVAR & Complex Anatomy
Anatomy is the single most important factor in deciding whether to treat the AAA with EVAR or open repair. Although their long term follow ups are yet to come, the advent of new techniques and devices such as fenestrated and multi-branch endografts has shown promising results in patients with a short, angulated or otherwise challenging proximal neck. A few new endograft designs are currently under trial attempting to improve issues such as deliverability, fixation, flexibility and durability (16).

EVAR techniques have also been subject to considerable changes. Hybrid procedures have shown the potential for extension of stent graft applications to the aortic arch, ascending aorta, and thoraco- abdominal aortic pathologies. Furthermore, randomised clinical trials are under way to determine whether the generally accepted threshold of 5.5 cm for elective open AAA repair should be decreased in EVAR candidates (13).

However, there are still many patients with anatomies, such as unfavourable neck, tortuosity, or difficult access that preclude them from candidacy or cause them to have sub-optimal results keeping a wide open field for device manufacturers and physicians to refine existing platforms and conceive of possible next-generation solutions.

The Future of EVAR
The future of EVAR as the potential gold standard for aortic aneurysm therapy is highly dependent on the vision and creativity of both, interventionists and technology innovators. The next generation of aortic endografts with more flexibility and lower profile as well as application of new techniques such as electromagnetic (EM) tracking systems, 3D navigation, real- time MRI guidance and robotic technology could facilitate visualisation, improve accuracy, reduce contrast requirements and simplify the follow up, bringing EVAR even closer to the ideal AAA treatment.

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Standards of Practice

All CIRSE SOP documents can be viewed at www.cirse.org

Standards of Practice Committee Chairman Thierry de Baère and his committee are happy to announce that CIRSE has recently released two new standards of practice documents.

Fabrizio Fanelli from the Sapienza University in Rome and Michael Dake from the Stanford University School of Medicine, California, have drawn up a comprehensive SOP document on the endovascular treatment of thoracic aortic aneurysm and type B dissection and portal vein embolization which will be published in CVIR shortly. Another new standards document was elaborated by Alban Denys and Nicolas Demartines from the University of Lausanne, Switzerland in cooperation with Frederic Deschamps and Thierry De Baère from the French Institut Gustave Roussy. Afshin Gangi, Georgia Tsoumakidou and Xavier Buy's guideline on bone tumour management has recently been made available online at the CIRSE website.

A document on Percutaneous Ablative Techniques of Intervertebral Discs by Alexis Kelekis and a document on Liver RFA by Thierry de Baère and Laura Crocetti are about to be completed. All documents will be available in CVIR shortly and can be viewed at www.cirse.org.

Together with the SIR CIRSE is working on guidelines on embolization, patient radiation dose management and the treatment of lower extremity superficial venous insufficiency with ambulatory phlebectomy.

Management of acute femoro-popliteal thrombosis

Fabrizio Fanelli
Vascular and Interventional Radiology Unit
"Sapienza" University
Rome, Italy

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SFA
Special Session
Tuesday, September 22, 08:30-09:30
Auditorium 6

Acute peripheral arterial occlusion is responsible for a wide variety of complications culminating in limb loss or death. The incidence of acute limb ischemia is still unsettled, but it is assessed at 14/100.000 people and accounts for 10-16% of the vascular workload.

Various causes for acute occlusions of the peripheral arteries have been described:
- thrombosis of a native artery with atherosclerotic stenoses
- thrombosis of an arterial bypass graft
- embolism from the heart
- aneurysm
- atherosclerotic plaque
- thrombosed popliteal aneurysm

Generally speaking acute arterial occlusion is mainly provoked by embolism and thrombosis whose differentiation is difficult and clinically impossible in 10-15% of cases. The severity of acute peripheral arterial occlusion primarily depends on location and extent of luminal obstruction by a new thrombus or embolus and the capability of the existing collateral bed to let the blood flow around the obstruction.

Three different stages of the disease are clinically classified:

I-Viable
II-Treated
III-Irreversible

The sudden onset of hypoperfusion of the leg rapidly leads to systematic acid-base and electrolyte disorders that impair cardiopulmonary function. Successful revascularization may induce a severe injury, causing further neuromuscular damage within the extremity.
Thrombolytic agents have been clinically employed since 1955. In the early 1970s thrombolytic agents were administered by intravenous route; Streptokinase and Urokinase are effective in restoring the patency of acute occluded arteries in about 75% of cases.
The high risk of bleeding complications of systemic infusion has increased the catheter-direct thrombolytic therapy.

Thrombolytic therapy can be used in case of acute thrombosis of a patent by-pass graft or native artery, acute arterial embolus not accessible to embolectomy, acute thrombosis of a popliteal artery aneurysm resulting in severe ischemia and acute thromboembolic occlusion when surgery involves a high degree of mortality risk. Contraindications to thrombolysis can be divided into:

Absolute - active bleeding diathesis, acute gastroduodenal ulcers, recent gastrointestinal bleeding within previous 10 days, history of stroke, neurosurgery or intracranial trauma within 3 months
Relative - uncontrolled hypertension, intracranial neoplasm, intracerebral vascular malformations, antiplatelet therapy
Minor - renal or hepatic insufficiency

Patients with an acute, severe, irreversible limb ischemia and no evidence of collateral circulation are not candidates for thrombolysis.
Indeed in these cases the rapid restoration of the blood flow increases the risk of the rare (<1%) but serious reperfusion syndrome. Intra-arterial thrombolysis is based on the original technique described by Mc Namara and Fisher in 1985. In patients with femoral and iliac occlusion the favourite access site is the controlateral femoral artery. Access through the ipsilateral femoral is preferred for thrombi in the superficial femoral artery, popliteal artery or tibial arteries.

By using the ipsilateral limb access, potential catheter-related complications in the intact limb are avoided. If no femoral artery can be used, a brachial approach may be considered. The thrombolytic agent can be infused through a catheter with the tip at the level of the proximal part of the thrombus or with the catheter advanced within the thrombus. Several studies have documented that forceful infusion of the thrombolytic agent into the entire length of the thrombus accelerates thrombolysis.

A successful passage of the guidewire through the thrombus predicts >95% likelihood of successful lysis, whereas inability to pass the thrombus reduces the chance of success. A positive outcome is more frequent in prosthetic graft (78%) and native arterial occlusion (72%) than in vein graft thromboses (53%). An efficacious procedure is based on the aggressive initial lacing of the entire length of the thrombus with a high dose bolus of lytic agent, followed by a continuous low-dose infusion.

Another technique is based on the use of a pulse-spray infusion of forceful periodic injection of thrombolytic agent into the thrombus in order to fragment it and increase the surface area available for the action of the lytic agent. Different types of plasminogen activators have been used, such as Streptokinase, Urokinase, Tissue-type Plasminogen Activators (rt-PA), Recombinant Glycosylated Pro-Urokinase and Recombinant Staphylokinase.

Nowadays in most centres Urokinase is preferred, as it achieved a higher initial clinical success rate with a lower incidence of bleeding complications. Several studies have also demonstrated the validity of rt-PA (Alteplase) especially in case of fresh thrombus. It permits a more aggressive treatment, but an accurate analysis of the clinical history of the patient is mandatory to avoid intracranial hemorrhagic complications. Rt-PA seems to induce a more rapid thrombolysis than urokinase, but statistically there is no difference either in the number of patients achieving complete lysis at 24h or in the clinical outcomes at 30 days.

A non randomized retrospective analysis has been performed to compare the efficacy and safety of local infusion of Streptokinase, Urokinase and rt-PA (Table 1). However, cost-analysis studies comparing rt-Pa and Urokinase are not available for the present. New thrombolytic agents with a superior fibrin-specificity are currently subject to an extensive investigation with the main target to decrease the bleeding complication rate of intra-arterial thrombolysis.

The percutaneous treatment of acute thrombosis can be associated with some technical complications related to intra-arterial catheter insertion including pericatheter thrombosis (3%). To minimise the risk of pericatheter thrombosis it is necessary to maintain a therapeutic anticoagulation and to avoid any unnecessary prolongation of the infusion. Other complications are represented by distal embolization of thrombus fragments during treatment, causing a sudden onset of pain or loss of distal pulse. This can occur with an incidence ≥5%. Most such emboli are resolved prolonging the lytic therapy.

Table 1: Non randomized retrospective analysis comparing results of local infusion of Streptokinase, Urokinase and rt-Pa

	Streptokinase (%)	**Urokinase** (%)	**Rt-PA** (%)
Complete Thrombolysis	60	91	95
Major Hemorrhage	28	12	6
Death	4	2	0
Intracranial Hemorrhage	2	0	2

Compartment syndrome, a complication secondary to a rapid reperfusion of the limb, occurs in 2% of patients. It is clinically manifested with pain, tenseness over the anterior muscle compartment and progressive loss of muscle and nerve function. Fasciotomy successfully relieves the high compartment pressures.
Death is a rare complication (<1%) and is often secondary to intracranial, intraperitoneal haemorrhage or reperfusion syndrome. Surgical revascularization is indicated in case of profoundly ischemic limb.

Embolectomy should be performed in case of acute ischemia with loss of sensitivity, discolouration of the skin, decreased skin temperature and moderate rigor of the muscles. When ischemia becomes irreversible, blotchy cyanotic discolouration is observed, the calf muscle has a firm consistency and there is anaesthesia and paralysis of the extremity. Primary amputation represents the treatment of choice.
Embolectomy can be performed via arteriotomy of the femoral artery using Fogarty catheters. Multiple passages of the catheter are recommended to avoid any residual embolic material being left. An angiogram should be performed at the end of the procedure, as residual stuff has been found in 25-40% of cases.

Many surgeons still consider surgery to be the best treatment option, despite reports of high mortality (20 to 30%) and morbidity. A large prospective randomized trial (TOPAS – Thrombolysis or Peripheral Arterial Surgery) comparing lytic therapy (Urokinase) and operative intervention (thromboembolectomy) has shown that both forms of treatment have similar results in terms of amputation-free survival. However, the exact role of the lytic treatment is unclear. Percutaneous thrombolysis can be considered an appropriate and valid therapeutic option especially in case of acute condition. Surgical procedure should be selected only in case of acute severe ischemia or profoundly ischemic limb. However, an accurate evaluation of the patient's clinical conditions is fundamental to correctly select the lytic agent and consequently reduce the incidence of bleeding complications.

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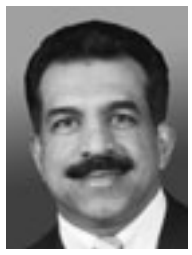

Thoracic stent grafting: Which patients, which stent-grafts, which technique?

Ajay Chavan
Professor and Head of the Department of Diagnostic and Interventional Radiology
Klinikum Oldenburg
Germany

Don't miss it !
Thoracic stent grafting: Which patients, which stents, which technique
Workshop
Monday, September 21, 17:30-18:30
Auditorium 8
Wednesday, September 23, 11:30-12:30
Room 3.A

Over the past decade and a half endografting has revolutionized the management of thoracic aortic disease. Reports of successful stent grafting of descending thoracic aortic aneurysms were quickly followed by the demonstration of their utility in type B aortic dissections.

Whereas atherosclerotic aneurysms generally present in patients above 65 years of age, aortic dissections have a peak incidence between 45 and 70. Younger patients, often below 45, predominate in the group with traumatic aortic injuries. Evidence in favour of stent-grafting as first line therapy in these patients is ample and ever increasing (1-7). Procedure related mortality (2.1 % vs. 11.7 %) and paraplegia (3 % vs. 14 %) rates with endovascular therapy are lower than in surgical series (8).

Thoracic aortic aneurysms
Descending thoracic aortic aneurysms with adequate anchoring zones (≥ 15 mm) distal to the left subclavian and proximal to the celiac trunk have long become the domain of endografting. Increasing experience with covering of the left subclavian artery in order to increase the length of the proximal neck has shown that such a manoeuvre is well tolerated by more than 90 % of patients, provided the circle of Willis intracranially is patent. A carotid-subclavian bypass as a second stage procedure is necessary in less than 10 % of the patients.

The fact that interventionists are participating actively in treating the aortic arch is evident from the development of hybrid endografts as well as hybrid-procedures. Hybrid endografts consisting of a proximal non-stented and a distal stented component are introduced antegradely via the aortic arch into the descending aorta while repairing the ascending aorta. The stented portion forms the distal `anastomosis´ in the descending aorta; the non-stented segment is used to reconstruct the aortic arch. Multi-segment pathologies affecting the ascending aorta, aortic arch and descending aorta, which classically require two or more operations, can thus be treated in a one-step procedure with the so called "Frozen Elephant Trunk" technique (9,10). As opposed to the hybrid endografts, hybrid procedures consist of surgically carrying out a conduit from the ascending aorta to the supra-aortic vessels followed by transfemoral stent-grafting of the entire aortic arch. The procedure is especially useful in pathologies of the descending aorta extending proximally into the aortic arch. Both procedures combine open surgery and endoluminal stent-grafting.

At the distal end, thoraco-abdominal aneurysms pose a challenge to the surgeon and the interventionist alike. Reports of branched endografts, with endograft sleeves to the celiac trunk and the superior mesenteric artery for treating thoraco-abdominal aneurysms have appeared in the past few years. The mid-term patency rates of branch vessels (one of the main issues) are about 90 %. The implantation procedure however can be lengthy and complex, and presently, the procedures are performed only at limited centres of excellence (11).

Aortic Dissections
Clinical experience has been gathered in patients with type B dissections over the past few years (6,7). Controversy exists regarding the usage of stent-grafts in chronic type B dissections. The same holds true for uncomplicated acute or sub acute cases. In contrast, stent-grafting appears to help in such cases with contained rupture or persistent intractable pain (12). A further indication is a rapid increase in diameter of the false lumen. Distal branch vessel ischemia in the acute or sub acute setting can also be relieved by stent-grafting. However, further peripheral interventions may be necessary to optimise the outcome (12,13).

Stent-grafting of retrograde type A dissections with entry tears in the descending aorta has been shown to induce thrombosis and resolution of the false lumen (6,12). Anecdotal reports exist of successful sealing of entry tears in the ascending aorta in acute type A dissections using a short endograft introduced transfemorally and placed between the coronary ostia and the brachiocephalic trunk (14).

Traumatic aortic injury
Patients in this group are generally younger with smaller aortas and access vessels as compared to those of other patients undergoing stent-grafting. Often only a short aortic segment around the isthmus requires to be covered by the endograft. With the endografts commercially available at present, aortas with diameters below 18 mm cannot be stented optimally. Selection of endograft size can be difficult. Endografts with smaller diameters fitting the aorta at the time of treatment may become too small with advancing age, with the associated risk of dislocation. Individual, case-specific solutions may have to be resorted to. Although the mid-term results of endografting in these patients are encouraging, only time can tell how these endografts hold out with the passage of time. Procedural mortality of stent-grafting in these patients is below 10% and the reported risk of paraplegia is negligible (3,4,15,16,17).

Stent-Grafts
At present about six endograft systems are commercially marketed (Bolton Medical, Cook, Gore, Jotec, Le Maitre, and Medtronic) in Europe. Off-the-shelf endografts with diameters ranging between 22 and 46 mm and lengths between 95 and 250 mm are available. Made to order endografts to suit individual patient anatomies are offered by most manufacturers. Consequently, too large an aortic diameter in the landing zones and too long an aortic segment to be covered by the endograft are no longer significant issues. The endograft skeleton is made of either nitinol or stainless steel, whereas the graft material is either polyester or ePTFE (polytetrafluorethylene). On the basis of the data available so far, a clear cut superiority of any one material over the others has not been proven. A factor which may be of relevance to the final outcome, however, is the size of the introducer system. Outer diameters of the introducer systems should be considered when choosing the endograft system. To my knowledge, the Medtronic devices have a slimmer profile than the other introducer systems.

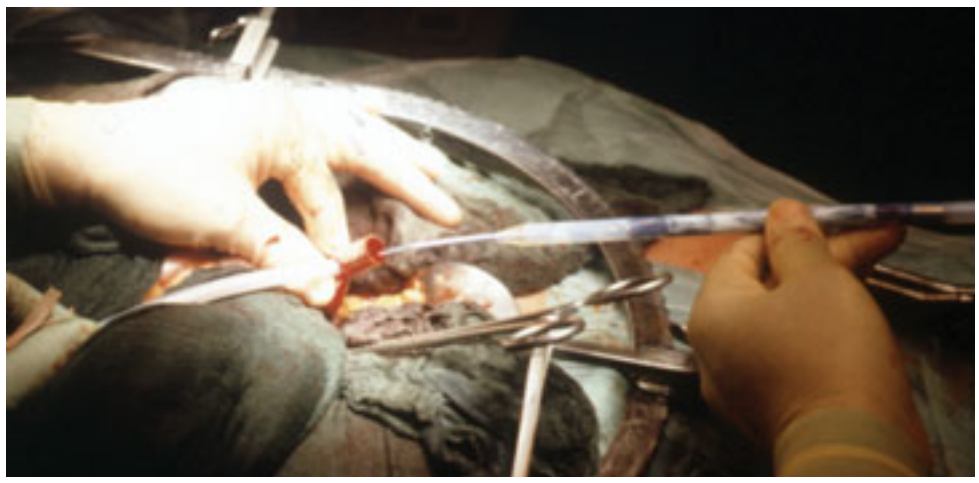

Fig.1: Thoracic endoluminal device being introduced via a dacron sleeve attached to the abdominal aorta.

Technique
Most stent-graft systems still necessitate a femoral arteriotomy. Care should be taken to expose the common femoral artery and as far as possible avoid using the superficial femoral artery. This renders the introduction of the device easier and helps reduce the incidence of post-operative surgical complications. In centres with large volumes, suture devices are being used more and more often for performing the procedures percutaneously. Should the access vessels be too small or tortuous, the introduction of the device can be facilitated by surgically suturing a conduit to the common iliac artery or to the abdominal aorta (Fig.1).

In patients with aneurysms, oversizing the endograft by 10-15 % in relation to the healthy aortic landing zone provides an optimal seal. In cases with type B dissections, the diameter of the non-dissected aortic arch should be used as reference diameter and over-sizing should be kept below 10 %. Ballooning of the endograft in cases with dissections may lead to further tears of the intimal flap and should be avoided. If correctly placed, the inherent radial expansion of the endograft normally seals the entry tear in the course of time.

To summarise, the answers in a nutshell:

Which patients?
- Those with descending thoracic aortic aneurysms and traumatic aortic injury.
- Thoracoabdominal aneurysms – with branched endografts – but only at centres of excellence.
- Aortic arch aneurysms and dissections - with a combination of open surgery and endografting.
- Retrograde type A dissections with entry tears in the descending aorta.
- Complicated acute or sub-acute type B dissections with persistent intractable pain, contained rupture, rapidly expanding false lumen or distal branch vessel ischemia.

Which stent-graft?
- This is a tough one! I would say the one with which the interventionist feels most comfortable.
- In patients with small or tortuous access vessels, go in for a low profile system.
- Use hybrid endografts to facilitate one-step total aortic replacement in multi-segment aortic pathologies.

Which technique?
- If possible, percutaneously, if not, via a femoral arteriotomy.
- Bypass non-negotiable access vessels using a surgical conduit to the common iliac artery or to the abdominal aorta.
- Oversize the endografts about 10-15 % in aneurysms and below 10 % in aortic dissections.
- Avoid ballooning in cases with dissections.

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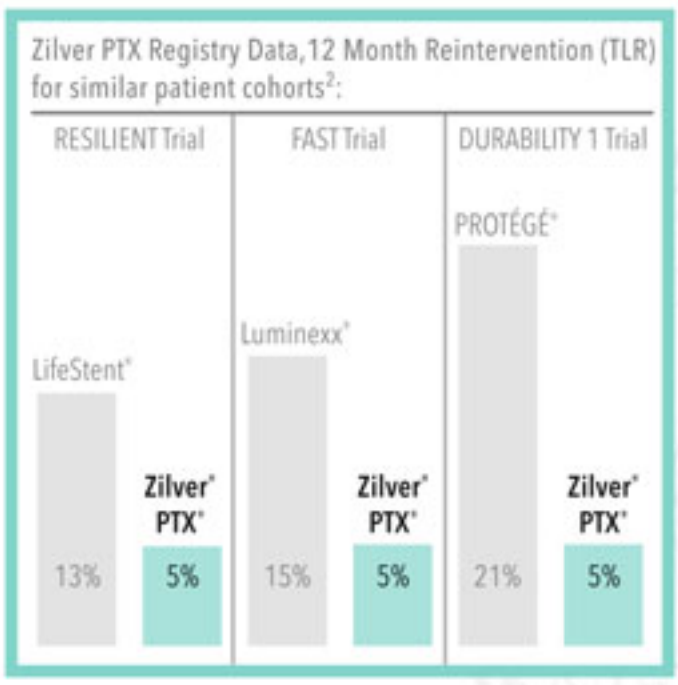

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Pancreatic Islet Cell Transplantation

Michel Greget
Interventional Radiology
University Hospital Strasbourg
France

Type 1 dependant diabetes mellitus (T1D) is consecutive to loss of insulin production due to the autoimmune destruction of β pancreatic cells (islets of Langerhans). Classical treatment is based on insulin therapy to normalise blood glucose levels and prevent acute and chronic complications of type 1diabetes.

Transplantation of human islets began in the 1970s, but it was not until 1989 than the first patient was able to stop exogenous insulin. The success rate improved dramatically in 2000 with the "Edmoton Protocol" based on the need to transplant high quality islets in sufficient number and the use of steroid-free immunosuppressive therapy (4,10). Generally admitted criteria for allogenic islet cell transplantation are C-peptide negative type 1 diabetes for more than 5 years with previous kidney transplantation or T1D with poor diabetes control including episodes of severe hypoglycaemia, hypoglycaemia unawareness, wide swings of blood glucose levels or consistently high HbA1c levels (>8%)(6,7,11).

Islets isolation is performed in a specialised laboratory by a dedicated team. Islets are processed from pancreases procured from cadaveric heart-beating donors. The procedure of islets isolation consists in placing the harvested pancreas in a digestion chamber after injection of an enzyme (collagenase or liberase) in the main pancreatic duct. Islets are purified from the obtained preparation by gradient in a cell separator. Islets are then cultured in adapted solution. All the processing is done under sterile conditions. To be suitable for transplantation, the islet preparation isolated from a donor must contain more than 250,000 islet equivalents and viability must be of up to 80% (12). The goal is to infuse 10,000 islets equivalent/kg of body mass of the recipient, although it is frequently necessary to perform one or two subsequent grafts.

The transplantation of islets is performed in a heterotopic location in the liver via the portal vein (8). The procedure is carried out under the responsibility of the interventional radiologist when performed percutaneously. The access to the portal vein is obtained by either trans-hepatic venous catheterisation or through a mesenteric vein during a mini-laparotomy. The percutaneous image-guided trans-hepatic route is mainly used. This procedure can be done under local anaesthesia and conscious sedation. An intrahepatic portal branch is generally punctured in the right lobe of the liver. Ultrasonic guidance allows succeeding and securing the puncture.

The remaining procedure is performed under fluoroscopic control. A guide wire is placed through the needle in the portal vein and a 4 to 6 French catheter is then pushed up to the portal trunk. Prior to islets infusion, an angiogram is performed to check the position of the catheter, the distribution and the patency of the portal tree (Fig.1). The pancreatic islets (size about 150µm) suspended in albumin solution are infused by gravity, along with heparin to embolise in the whole liver parenchyma. Portal pressure monitoring usually shows a slight elevation during cell infusion. At the end of the delivery, as the catheter is withdrawn, the trans-hepatic tract is usually occluded with an embolic agent. A prophylactic anticoagulation is continued for several days to reduce the likelihood of an instant blood mediated inflammatory reaction (9).

Exogenous insulin is given in the early post transplant period to prevent islet damage caused by hyperglycaemia.

The majority of serious adverse events related to the infusion procedure mainly consists in bleeding complications (13% of procedures) and, more rarely, in portal vein thrombosis (4%, partial or complete). The use of heparin has been shown to limit the incidence of thrombosis but to increase the rate of procedural bleeding. Sealing the intrahepatic tract has demonstrated a reduction of the incidence of post-procedural bleeding (13). The most frequently administered immunosuppressive protocol uses Sirolimus and Tacrolimus in combination as maintenance therapy (5, 7) and one or more induction agents (i.e. anti IL-2 receptor) at the time of the first islet infusion.

Due to the application of the Edmonton Protocol the results of Islet cell transplantation have dramatically improved since 2000. The report published by the Collaborative Islet Transplant Registry (CITR) in 2008 on 325 recipients of 624 islets infusions shows 23% insulin independence at three years, 29% insulin dependence with detectable C-peptide, 26% loss of graft function and 22% missing data (Fig.2). Severe hypoglycaemic events decreased dramatically from 85% of patients before transplantation to less than 5% in the first year (1). High numbers of infusion, greater number of islet equivalents infused, lower pre-transplant HbA1c, a processing centre related to the transplant centre and larger islet size are factors favouring the primary outcomes. In our Swiss-French multicentre study GRAGIL 2 concerning 18 patients (34 infusions), we report significant decrease of HbA1c levels (≤7%) in 67% of recipients, decrease of insulin requirement ≥30% in 89%, C-peptide ≥0,5ng/ml in 83% and no severe hypoglycaemia in 67% at one year after transplantation (2,3).

Conclusion : Transplantation of isolated pancreatic islets has presently become a clinical option to be considered in the treatment of T1D after kidney transplantation or in case of unstable T1D despite optimal insulin therapy.

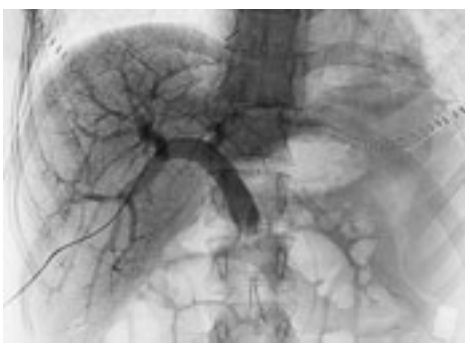

Fig.1: Pre-infusion portal angiogram in a combined Lung-Islet transplantation. A patient with end-stage cystic fibrosis and related type 1 diabetes mellitus benefited from double lung transplantation followed 7 days later by intra-portal Islet transplantation using the pancreas of the same donor.

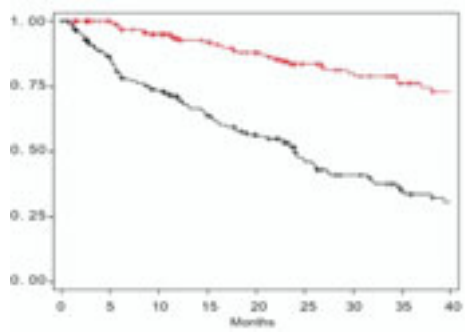

Fig.2: Results of Islet cell transplantation. Persistence of insulin independence (black) and persistence of graft function (red) months after last infusion in Islet Alone recipients (from Alejandro R, Barton FB, Hering BJ et al. 2008 Update from the Collaborative Islet Transplant Registry. Transplantation 2008 27; 86(12) : 1783-1788).

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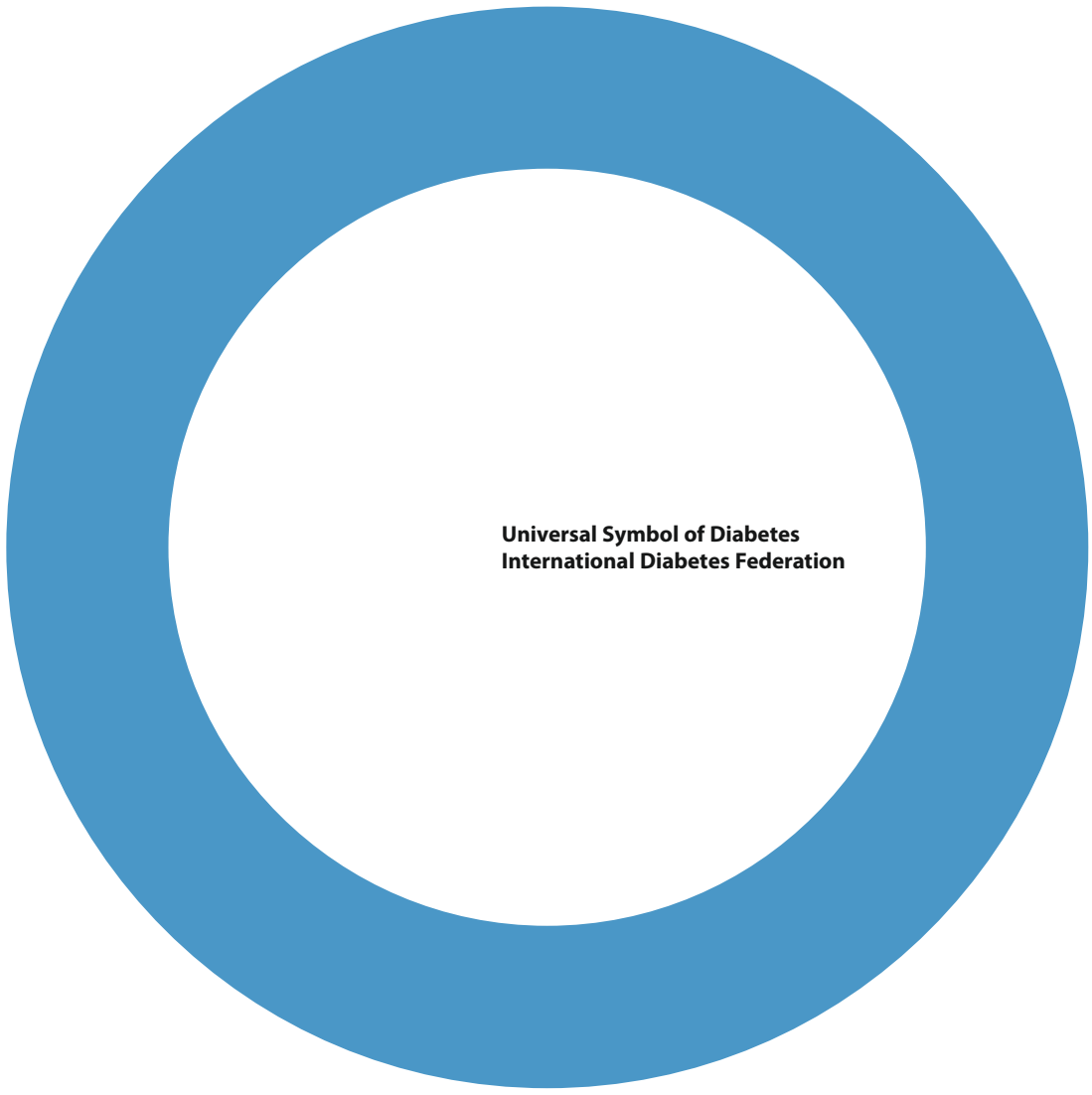
Interventional Radiology's Increasing Role in Diabetes Management



CIRSE joins forces with the International Diabetes Federation (IDF), the European Association for the Study of Diabetes (EASD) and the Danish-based World Diabetes Foundation (WDF).

Together, we are dedicated to further the research of diabetes and its complications, and through close work with other medical societies or industry partners, look set to increase the scope of our influence in the area of diabetes awareness and management.

A venture of particular interest is this year's collaboration between CIRSE and the EASD. We are working together to promote both awareness of medical solutions to diabetic complications and research into further treatment options. Within this framework, prominent opinion leaders offer an exclusive account of diabetes at "CIRSE Meets EASD" at 1pm tomorrow, Tuesday September 22.

Collaboration between CIRSE and the IDF Working Group on the Diabetic Foot is also underway with the purpose of revising the existing guidelines for the treatment of the condition, as well as launching an educational programme which will deal with such issues as how to set up a diabetic foot clinic.

The decision to form such a joint venture was taken on the grounds that vascular disease is the major cause of death in people with diabetes, and is an area in which interventional Radiology is making incredible progress.

The mutual efforts of CIRSE and the major diabetes associations aim to raise awareness of the benefits of multidisciplinary care clinics, and encourage individual hospitals, diabetologists and interventional radiologists to establish such institutions.

www.cirse.org
www.idf.org
www.easd.org

CIRSE

International Diabetes Federation

EASD

One not to miss!

For years the number of people suffering from diabetes has been rising at alarming speed. According to the World Health Organization, the number of patients with diabetes will double by 2030. Out of the numerous complications caused by diabetes, PVD is one of the most severe. It is estimated that it accounts for approximately 70% of all non-traumatic amputations.

It is clear that diabetes will constitute one of the major medical challenges of the future. It has also been abundantly shown that Interventional Radiology can assume an important role in the fight against the disease, providing minimally invasive solutions to intermittent claudication and PVD. The question is how well physicians from the various fields dealing with the treatment of diabetes will cooperate in their fight against this crippling disease.

In an effort to foster this much needed cooperation, the "CIRSE Meets" session at 1pm tomorrow will feature the European Association for the Study of Diabetes (EASD).

CIRSE talks to Andrew J.M. Boulton, Vice President and Director of International Postgraduate Education European Association for the Study of Diabetes.

Q: What have been the milestones in the history of the EASD?
A: The EASD was founded in Montecatini, Italy, in 1965. Its initial aim was to bring together scientists, physicians, laboratory workers, nurses and students with an interest in diabetes in Europe and it has expanded greatly over the last 44 years. Its main activities are the organization of an annual meeting that attracts up to 1,800 individuals and providing postgraduate education on diabetes and its complications. It has a high impact factor journal – Diabetologia – and it organises a number of other activities, the most important of which has been the establishment of the European Foundation for the study of diabetes which is a grant giving body.

More on the treatment of the diabetic foot. Don't miss today's session….

08:30-09:30
BTK in diabetics Special Session
Auditorium 8

Moderators: D. Henroteaux (Liège/BE), J.A. Reekers (Amsterdam/NL)

Factors and time line of healing of the diabetic foot
S. Morbach (Soest/DE)

Update on results of PTA
K. Katsanos (Patras/GR)

Update on results of stents
T. Rand (Vienna/AT)

Long infrapopliteal occlusions
A. Bolia (Leicester/UK)

CIRSE meets EASD

Tuesday, September 22
13:00-14:45

Auditorium 1


Jim A. Reekers
CIRSE President

J.M. Boulton
Vice President European Association for the Study of Diabetes

Today the membership of the EASD comprises more than 7,000 individuals from over 130 countries and the EFSD has raised over € 60,000,000 for European Diabetes Research in partnership with industry and the Juvenile Diabetes Research Federation as well as through independent funding. The first grants were awarded in 2001 and regular calls for grant applications are made each year. Another activity of the EASD is its study groups. People with particular interests have regular meetings, e.g. for the area of most interest to CIRSE; the diabetic foot.

Q: What is your main membership?
A: Our main membership comprises healthcare professionals with an interest in diabetes. Diabetes awareness is promoted through postgraduate education and more recently through the introduction of webcasts which are available for free on the internet.

Q: Do you think that the number of patients with diabetes will continue to rise the way it has in recent years?
A: We are currently facing an epidemic of type 2 diabetes and it is projected that there will be more than 350,000,000 patients worldwide with diabetes by 2025, although this is most probably a gross underestimate. Sadly the numbers do indeed continue to rise and it is likely that, for example in India, there are more people with diabetes (both known and unknown) than the whole population of the United Kingdom.

Q: Do you have any patient support initiatives?
A: Patient support initiatives are generally carried out by National Societies such as, for example, Diabetes UK.

Q: Do you think that awareness campaigns will be able to slow down this development and which efforts can yield the best results (healthy eating campaigns, lobbying government, diabetes training courses for GPs, etc.)?
A: There is no doubt that promoting awareness amongst high risks groups and healthcare professionals is essential in tackling the worldwide epidemic of type 2 diabetes. Healthy eating campaigns and government lobbying are of course important and as noted above we do run postgraduate courses for GPs and other healthcare professionals. More recently, we have embarked upon international postgraduate education and regularly run courses in developing countries and recently we have had such courses in South America, Vietnam and India. The EASD also runs regular postgraduate courses in China.

Q: How do you think the EASD and CIRSE could best cooperate in the fight against diabetes related complications?
A: Co-operation is essential between our two organisations, as vascular disease is the major cause of mortality in people with diabetes. In addition to joint symposia at our annual meetings, the possibility of joint research activities is also an important one.

Q: Do you think endocrinologists and interventionists could join forces to treat diabetes? What form could this partnership take?
A: Naturally I believe that diabetologists and interventional radiologists should join forces to work together and one area is the possibility of having joint clinics which could be run periodically, attended by both specialties for patients who have particular vascular problems.

Q: Do you dispose of statistics on IR treatment of diabetic complications in Europe – referral rates/channels, policy, numbers of clinics, etc?
A: Unfortunately the EASD does not collect statistics on interventional radiological treatment for diabetic complications in Europe, although the diabetic foot study group of the EASD is looking into the possibility of having such a registry.

Be sure to visit tomorrow's exclusive session: CIRSE Meets the European Association for the Study of Diabetes (EASD)

Minimal Invasion, Maximum Impact

In the Middle Ages, they used to taste urine to test for diabetes; 90 years ago, experiments on dogs paved the way for insulin treatment and in 1963, Dotter's theory behind angioplasty proved a medical breakthrough in limb salvation.

Diabetes is predicted to reach pandemic levels within 15 years, but what are the real facts and figures? What needs to be done to prevent its spread? Interventional Radiology has come very far in diabetes treatment and continues to do its bit to reduce the impact of this life threatening disease.

THE STATS
- Diabetes causes as many deaths each year as HIV / AIDS.
- In 1985, there were an estimated 30 million diabetics worldwide, 246 million in 2007 and a predicted 380 million in 2025.
- Cardiovascular disease is the major cause of death in diabetes, accounting for some 50% of all diabetes fatalities, and much disability.

THE TEAM
- **Diabetologists**
- **Podiatrists**
- **Orthopaedics**
- **Interventionists**
- **Vascular Surgeons**
- **Technicians**
- **Nurses**

The most effective diabetic care clinics are those that are multidisciplinary and there is strong evidence that such an approach can reduce amputation rates by a sizable percentage.

THE ECONOMICS
- The cost of 16 amputations is more than the cost of managing 120 active ulcer cases or 834 preventative cases.
- The direct costs of 8 below-knee amputations is equal to the combined annual salary of a medical team of 3 doctors, 5 nurses, 1 dietician, 1 secretary and 3 auxiliary staff.

A great proportion of these costs are attributable to amputation, prolonged hospitalisation and aftercare.

Clearly, even from a budget perspective, prevention is far better than cure. Early intervention and proper treatment is key, and offers good value for money.

THE POLITICS
Interventional Radiology holds many clinical and economic benefits within the field of diabetes. Raising awareness of these benefits as well as a review of the medical structures will prove indispensible to the progression of the discipline and can bring much needed developments to fruition.

- Standardisation of IR training
- Greater interdisciplinary cooperation
- Suitable referral system
- Direct patient contact
- Appropriate clinical facilities

THE FUTURE
The discovery of insulin and the insulin producing beta cells of the pancreatic islets has proved to be an essential step in the search for a cure. As research into possible cures is being carried out in various fields of medicine, physicians could be on the brink of finding a definitive cure.

The minimally invasive treatment of pancreatic islet transplantations offers patients an effective alternative to open surgery with the added benefits of being less painful and more cost-effective. With advances such as the Edmonton Protocol being made into decreasing the risk of immunosuppressant drugs, pancreatic islet transplantations could well be a key future diabetic cure.

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CM 2401 **CIRSE meets the European Association for the Study of Diabetes (EASD)**

Moderators: A.J.M. Boulton (Manchester/UK), J.A. Reekers (Amsterdam/NL)

2401.1 **The diabetic foot in 2009 - an overview**
A.J.M. Boulton (Manchester/UK)

2401.2 **Medical aspects of peripheral vascular disease in diabetes**
N. Schaper (Maastricht/NL)

2401.3 **Arterial bypass versus angioplasty in diabetic peripheral vascular disease**
M. Lepäntalo (Helsinki/FI)

Advertorial

Providing Evidence for Plaque Excision

Atherectomy has experienced increased interest as a treatment in the peripheralarteries. Recent data indicates that plaque excision is an effective solution for patients suffering from PAD that can result in excellent patency, limb salvage, wound healing and pain reduction. As a leader in peripheral vascular disease technology, ev3 remains committed to conducting clinical studies using the SilverHawk™ Plaque Excision Device. In 2008, ev3 began investing in several clinical trials as a part of their strategy to continue enhancing the data available on atherectomy.

Initiated in April 2009, DEFINITIVE LE *(Determination of Effectiveness of SilverHawk™ Peripheral Plaque Excision System for the Treatment of Infrainguinal Vessels/Lower Extremities)* is the largest study to date to investigate the utility of minimally invasive plaque excision (atherectomy) for peripheral artery disease (PAD) as a frontline therapy. With an expected enrollment of up to 800 patients at 50 sites in the United States and Europe, this prospective, multicenter, single-arm study will evaluate 1-year patency rates in patients with claudication and limb salvage in patients with critical limb ischemia (CLI) after treatment with ev3's catheter-based SilverHawk™ Plaque Excision System. Because of the study's unprecedented large scope and hard endpoint with core-laboratory adjudication, it is expected to generate robust data to support the use of plaque excision in a wide variety of PAD patients.

DEFINITIVE LE may be the first large-scale study that will demonstrate where plaque excision can be used effectively in a wide series of patients. It is really an all-comers study looking at the simple claudicant with mild, moderate, or severe disease and also gleaning a tremendous amount of data for patients with CLI.

DEFINITIVE LE is examining patency rates after atherectomy, which is a standard endpoint in peripheral studies, but limb salvage, wound healing, are all critical when dealing with CLI patients with threatened limbs. The rate of wound healing, in particular, is being looked at in this study.

A large series such as DEFINITIVE LE, with multiple investigators at varying levels of ability will provide a very realistic interpretation of what the technology can do; it will allow to go in and actually look at these patients and perform an overall analysis as well as a subset analysis to more closely evaluate specific issues.

Another very interesting area that DEFINITIVE LE will look at is the comparison of the diabetic and non diabetic patient population and their outcomes.

Diabetics have a very high proportion of coronary and peripheral arterial disease, and their risk of limb loss is higher than that of patients who do not have diabetes.

There have been several kinds of glimpses into diabetics with plaque excision. The original TALON registry, which confirmed plaque excision with the SilverHawk™ as an effective treatment for patients with significant blockages above and below the knee, showed a fairly good result with diabetics who did just as well with plaque excision. Subsequent studies, both European and more recently the Columbia dataset, suggested that the TALON data were not outliers, and that plaque excision may have a role with diabetics who may respond just as well as nondiabetic patients with PAD. DEFINITIVE LE will advance the knowledge of the diabetic patient population and whether or not claudicants or CLI patients benefit by this type of therapy. DEFINITIVE LE will also include a substudy focused on protein and gene analysis of the plaque that has the potential to add new insight on the biology of the disease process and the potential differences between diabetics and nondiabetics.

Advertorial

The Crossroads Institute

An Established Standard for Medical Education in Cardiac and Vascular Disease Management

Since its establishment in 2000, Abbott Vascular's Crossroads Institute for Cardiac and Vascular Education has built a reputation for unrivalled medical education in interventional cardiac and vascular disease treatment. To date nearly 15,000 healthcare professionals at all stages of their careers have chosen the Crossroads Institute for its faculty of world-renowned experts, cutting-edge educational techniques, and unbiased approach to medical education.

1. FOCUS ON HEALTHCARE PROFESSIONALS

Programs are tailored to the different needs and levels of expertise of participants with an aim to equip them with the tools to achieve excellent patient outcomes. Many of these programs are CME-accredited.

- For practitioners, programs are offered on a variety of therapies. For experts, programs take the format of discussion forums. The latter provide an arena for reaching common consensus on the most current 'hot topics'.
- For young physicians, the Executive Fellowships help develop skills that complement university curriculum through modular programs.
- For nurses, technicians, pharmacists and purchasing staff, modular programs are offered in the form of Crossroads Institute-in-a-Box. These programs aim to increase knowledge of the support staff to make them more effective in their daily responsibilities.

Abbott Vascular and Crossroads also support and collaborate with ESIR – The European School of Interventional Radiology, to offer specific courses.

2. FOCUS ON TECHNOLOGIES

In clinical practice, one of the most important factors that any healthcare professional faces is patient safety. The ability to react with good judgment comes with experience, especially in unexpected or critical situations. Experience can only be gained from continuous practice. This is why Crossroads has developed programs that develop skills by training through:

- **Simulation**

Simulators provide valuable hands-on opportunities that enhance the interventional experience, reducing risk to the patient.

- **Cath lab experience**

Using the latest imaging technology, this model provides real-life cathlab setting where a variety of catheterization techniques can be performed.

- **Hybrid Flow Models**

The Hybrid Flow Model is a synthetic replica of the human arterial anatomy that allows physicians to practice procedures and treat different types of complex lesions, allowing a detailed view on product behaviour.

3. FOCUS ON THERAPIES

Core Programs have been developed to offer the latest insights into management of peripheral arterial disease and carotid artery stenosis. The Crossroads Institute Program Director and faculty members review the most recent scientific publications, practices, and evidence-based medicine outcomes, applying objective principles to develop state-of-the-art content.

"The Crossroads Institute offers best-in-class medical education on interventional treatment options for cardiac and vascular disease," said Dr. Luc Stockx, M.D., medical education program director for the Crossroads Institute. "Our objective is to equip attendees with the best skills and knowledge, through teaching imparted by thought leaders in interventional procedures, to achieve the best outcomes for their patients."

ABOUT THE CROSSROADS INSTITUTE

The Crossroads Institute is funded by Abbott Vascular and headquartered in Brussels, Belgium, with additional facilities in Tokyo, Japan, and Johannesburg, South Africa. For more information, contact your local Abbott Vascular representative.

ABOUT ABBOTT VASCULAR

Abbott Vascular, a division of Abbott, is one of the world's leading vascular care businesses. Abbott Vascular is uniquely focused on advancing the treatment of vascular disease and improving patient care by combining the latest medical device innovations with world-class pharmaceuticals, investing in research and development, and advancing medicine through training and education. Headquartered in Northern California, Abbott Vascular offers a comprehensive portfolio of vessel closure, endovascular and coronary products.

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

AP2930698 Rev. A

Film Interpretation Panel

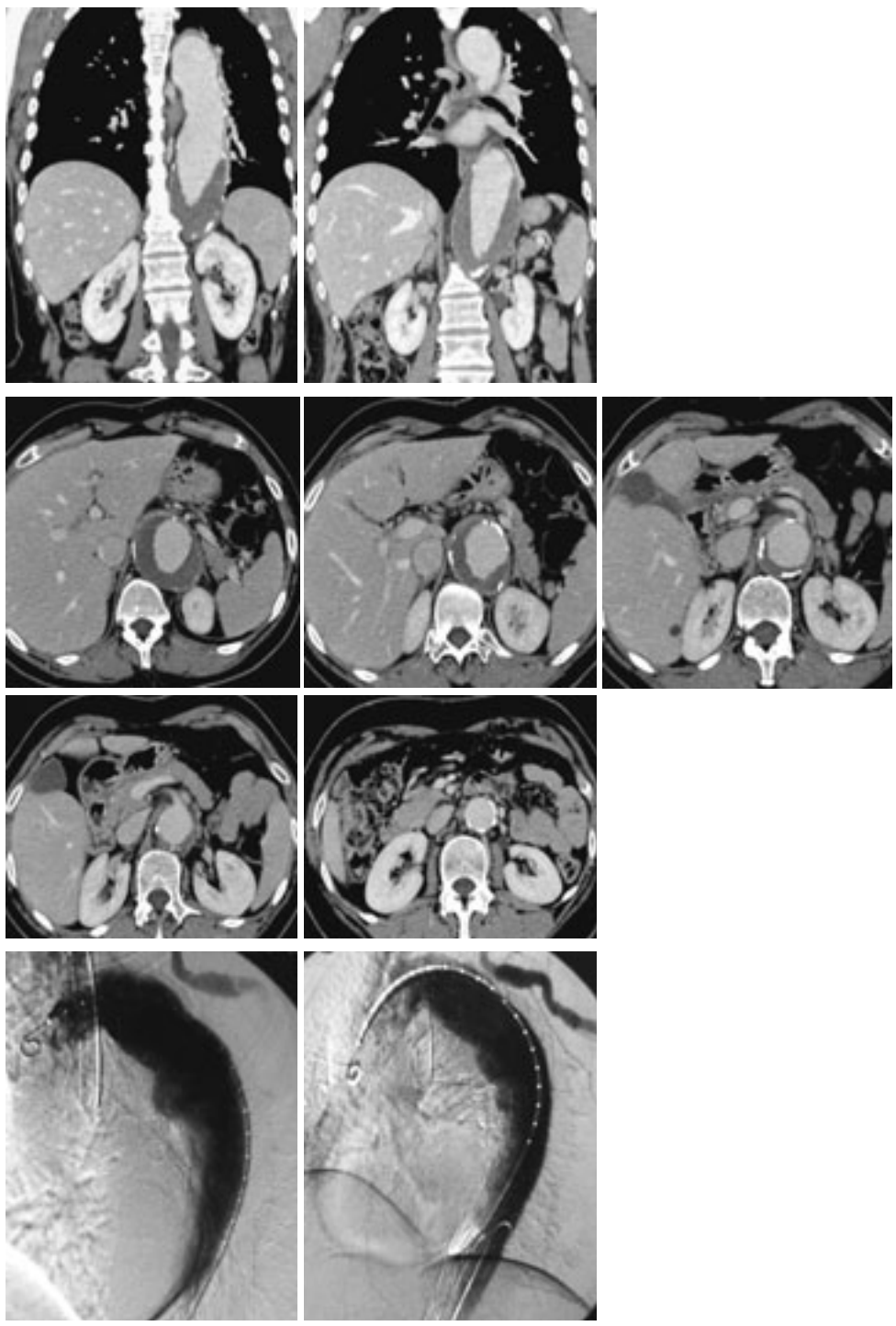
**Join us for this year's Film Interpretation Panel and see how much fun an educational session can be! Together with junior panellists senior IRs will diagnose several tricky cases.
To give you a head start, we are showing you the cases in advance.**

Don't miss it !
Film Interpretation Panel
Monday, September 21, 15:00-16:00
Auditorium 1

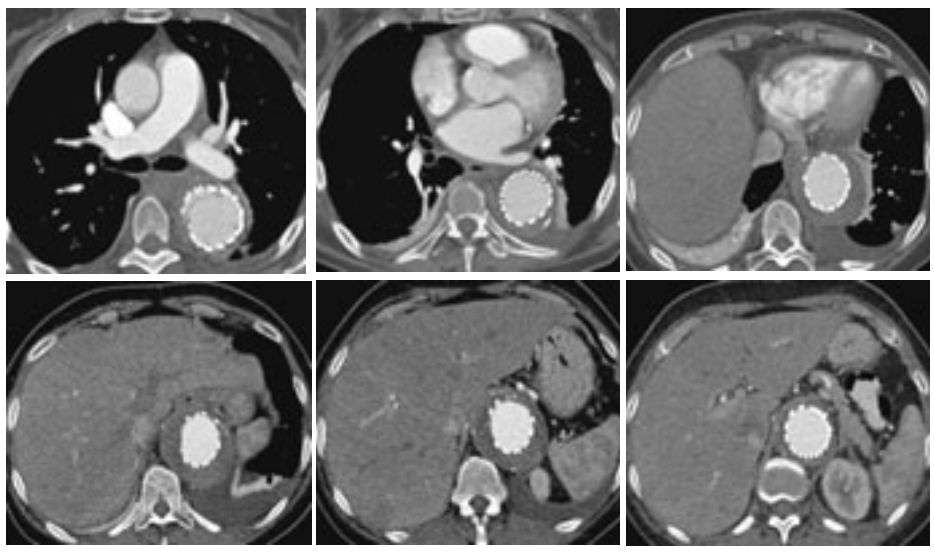
Case D

Female, 70 y.o.

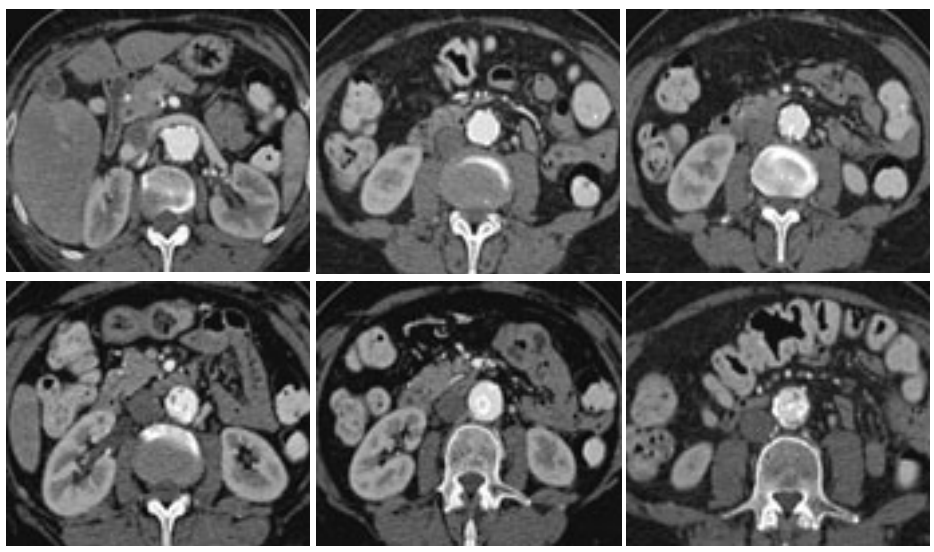
- **History of hypertension**
- **Atherosclerotic aneurysm of thoracic aorta**
- **No dissection**
- **EVAR is undertaken**



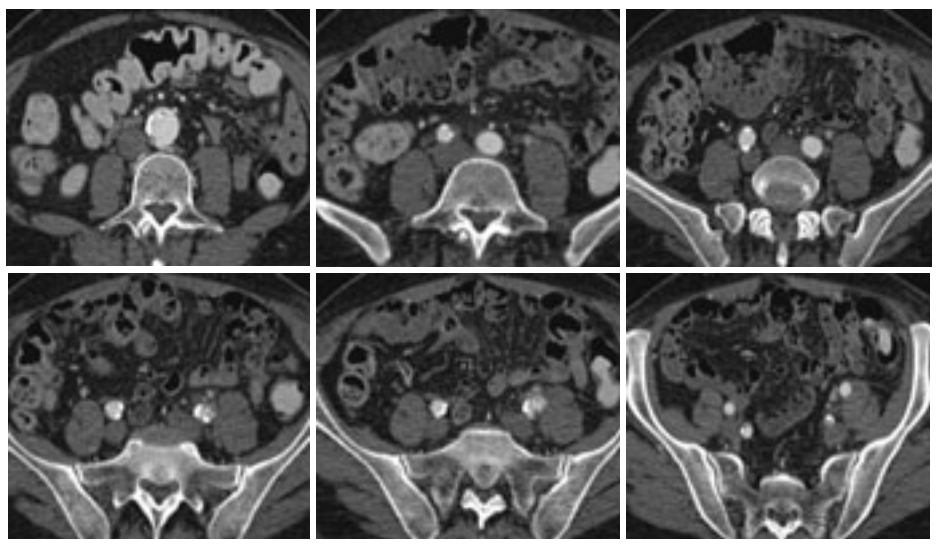
5 days after placement, vague abdominal pain – c.e.CT



5 days after placement, vague abdominal pain – c.e.CT



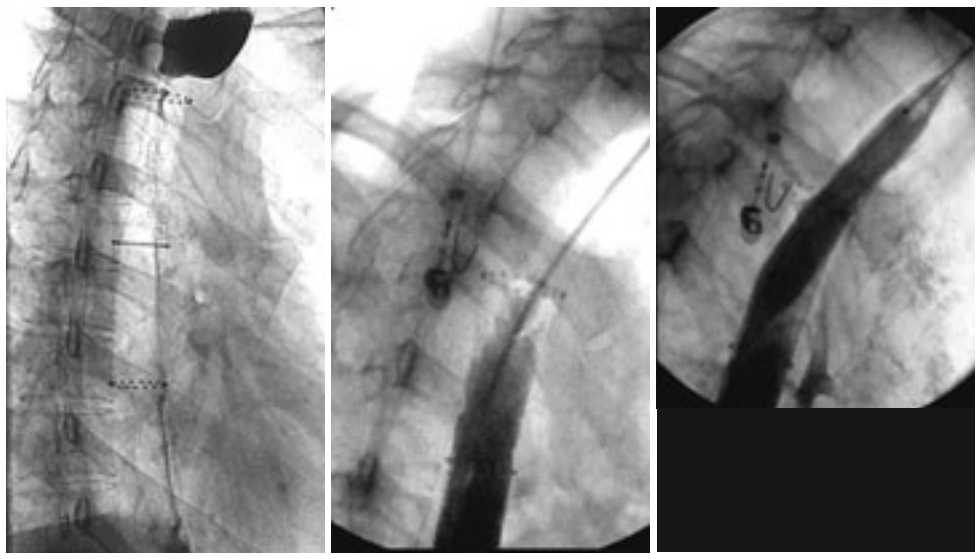
5 days after placement, vague abdominal pain – c.e.CT



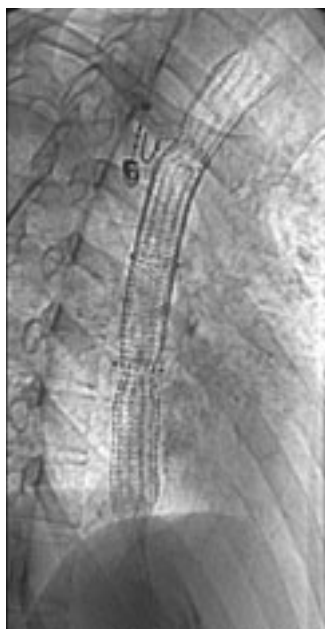
Case E

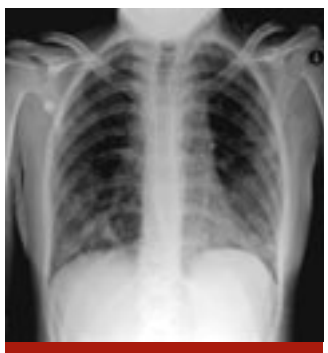
Female, 26 y.o.

- Patient with Fanconi anaemia and inoperable oesophageal cancer
- Treated with palliative chemo-radiotherapy and plastic polyflex oesophageal stent
- Presented two months after stent insertion with total dysphagia

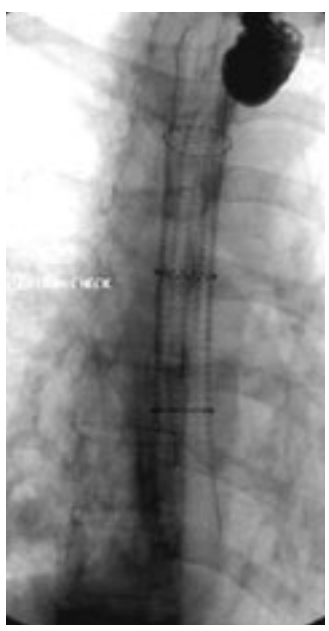


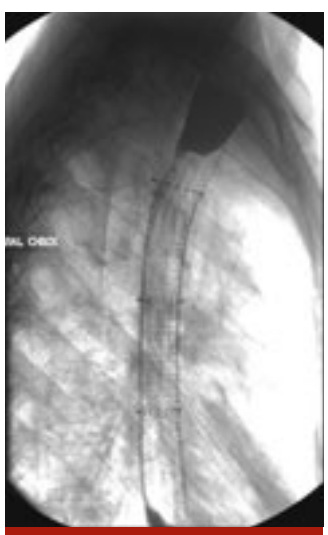
Contrast swallow demonstrated overgrowth which was treated with balloon dilation and restenting





- Two uncovered 23mm x 10cm ultraflex stents inserted
- Severe chest pain post procedure





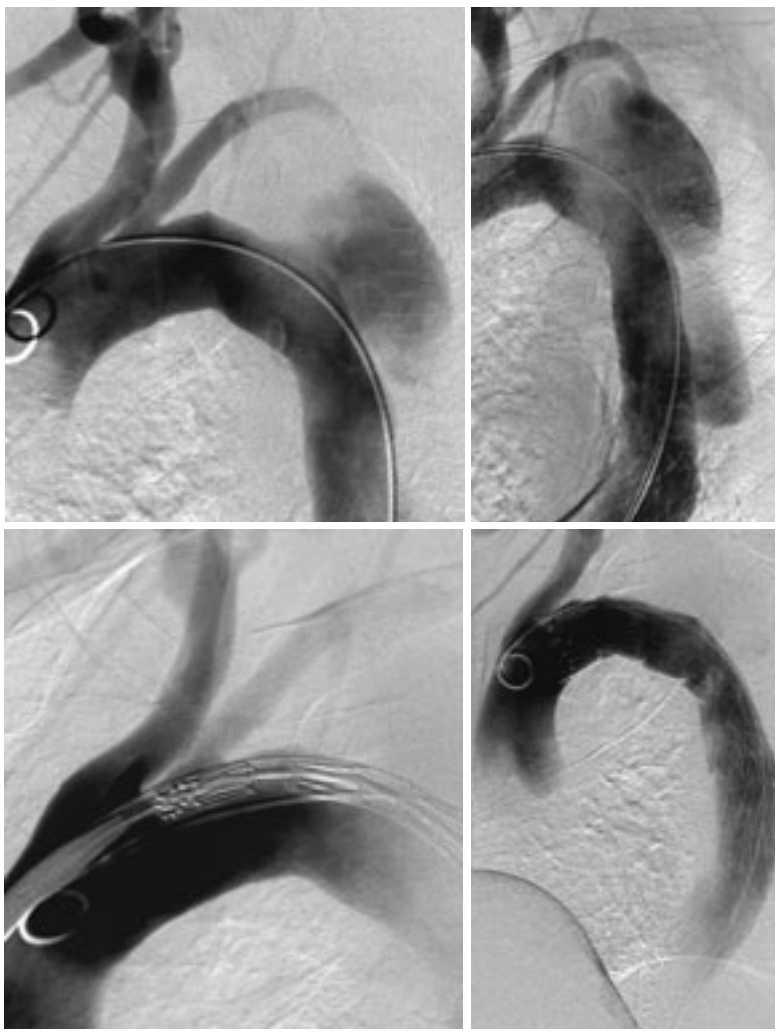
4 hr post - check swallow

What has happened?
What can you do?

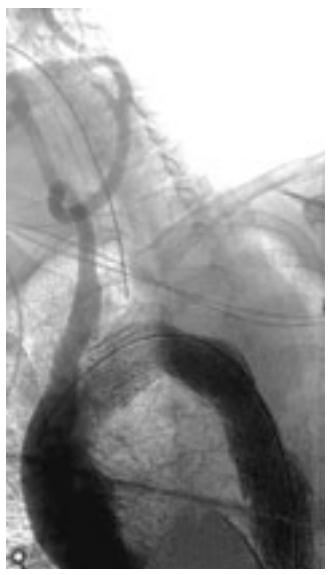
Case F

Female, 61 y.o.

- Chronic dissection
- Pre-procedure C-C bypass



1 hr post-procedure
- Epileptic fit
- No arm pulses
- Angio

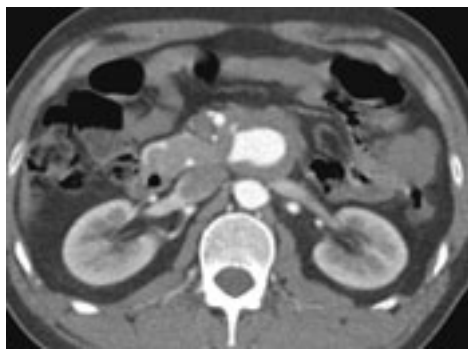


What has happened?
What can you do?

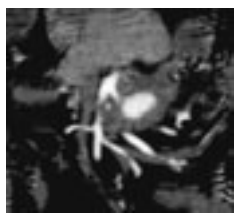
Case G *(Courtesy of Johannes Lammer)*

Male, 32 y.o.

- **Presents with**
  - **anaemia**
  - **recurrent melena**
- **No relevant Past Medical History**



What do you see?



Sagittal reconstruction

What else is interesting? (1)

Coronal reconstruction

What else is interesting? (2)

See you today!
Come & play!

Today, 15:00-16:00
Auditorium 1

Mark your Calendar !

ECIO 2010

Second European Conference on Interventional Oncology

April 21-24, 2010
Florence, Italy

- Technical Focus Sessions
- Clinical Focus Sessions
- Workshops
- Multidisciplinary Tumour Board
- ECIO meets ESMO
- ECIO meets ILCA
- ECIO meets WCIO

MAIN TOPICS

- Tumour ablation
- Advances in image guidance
- Intra-arterial treatments
- Radioembolization
- Hepatocellular carcinoma
- Lung/Kidney/Bone tumours
- Current and future research in interventional oncology

www.ecio2010.org

What to do in Lisbon

Petra Mann
CIRSE Office

Tram line 28
In order to get a first overall-impression of the city I highly recommend taking the 28 tram crossing the city from East to West. You might think that you'd rather walk, but when they say Lisbon was built on seven hills, unlike in other cities they really mean it. A short walk through a small neighbourhood can therefore sometimes require the stamina of an alpinist, so if you have left your climbing axe at home, do catch a tram and enjoy a beautiful ride through Lisbon's most famous districts, such as Baixa and Alfama.

Except for one line, all of Lisbon's trams have remained almost unchanged since their introduction in the 19th century when they were first imported from America, hence giving them their original name *americanas*. Today most Lisboners refer to them as *eléctricos*. In order to get through Lisbon's winding and often very steep roads, they consist of a single car, which is why you might sometimes have to wait for the next tram, unless you want to get to know the Lisboners from up close, REALLY close.

As the 28 line is usually filled with tourists gaping at the beautiful views, you might unwittingly have acquired the services of a personal pick-pocket with your ticket, so make sure to keep an eye on your belongings!

Jerónimos Monastery
When entering Lisbon from the West you will first get to the Belém disctrict. Literally meaning Bethlehem, this is the part of town most strongly linked to Portugal's seafaring past. Unfortunately the corresponding taverns have long gone and so have the sailors (Sorry, girls!).

Legend has it that Vasco da Gama and his men spent the night in prayer at the site of the monastery before departing for India in 1497. Upon da Gama's return from the successful voyage (well, successful for the lucky third of the crew who survived it, I guess) Manuel I. commissioned the construction of Jerónimos Monastery to commemorate the epic feat. The very distinct architecture of the monastery is Manueline style, named after said emperor. Its main features are inspired by seafaring and the countries discovered during Portugal's Age of Exploration, thus incorporating rope-like structures, palm-tree shaped columns and such, although you will look for tattooed sailors and ladies of the night in vain.

In 1755 the strongest earth quake ever recorded in European history hit Lisbon, causing a massive tsunami and countless fires on top of its estimated magnitude 9 on the Richter scale and almost completely wiping Lisbon off the face of the earth. Miraculously Jerónimo's Monastery survived the seism almost undamaged, the missing statues on some of its columns being the only evidence of the catastrophe.

Lisbon experiences light earthquakes quite frequently, so if you feel the ground shaking, this might not necessarily be the consequence of an early happy hour. I was assured that these light quakes are a good sign, though, as "big ones" are preceded by a lack of seismic movement. If it is a big one, an elevated alcohol level is probably better anyway.

Christo Rei
Although not as big and imposing as Rio de Janeiro's Christ the Redeemer statue (and therefore probably coming with less redemption), Lisbon's Christo Rei is still quite an impressive landmark. The funny thing is that it was built under Salazar's dictatorship, once again showing the strange desire of totalitarian regimes to use religious figures as their pinups.

Another interesting fact is that the 28m statue was placed on a base three times as tall as the statue itself, so if you like concrete the way they did in the fifties, do go there! From the observation deck below the statue you will be able to enjoy a wonderful view of the city of Lisbon, the Tagus River and the 25 de Abril Bridge named after the date of the Carnation Revolution bringing an end to Salazar's regime.

The Cristo Rei Statue; nothing says salvation like 41 thousand tons of concrete!

Basilica de Estrela
This beautiful church in late baroque/neoclassical style is located on a hill in the Western part of Lisbon and can easily be reached with the 28 tram. It was commissioned by Queen Maria I. who had vowed to build a church if she gave son to an heir. She must have prayed a little too hard for her wish, though, as after the desired heir she gave birth to five more children, hence becoming the 18th century equivalent of octo-mom.

MORE TITBITS ON LISBON

- **Coffee**

If you feel like an espresso while on a break, ask for a bica. The Lisboners around you will surely be very impressed and applaud your command of the Portuguese language. That is, of course, until you have to say anything else. Coffee is referred to as bica only in Lisbon, though, as Bica is the name of the city's neighbourhood where it was first sold as a great novelty from the Brazilian colonies.

- **Fado**

Although fado music (literally meaning fate or destiny) can be about anything, it is most famous for its songs about the sea, the life of the poor and saudade – the nostalgia felt when missing someone who has usually gone to sea or left "to get cigarettes" and not returned since. Make sure to reserve one night of your stay to go to one of the many establishments playing fado. In Lisbon you can applaud a fado performance by clapping, while in the city of Coimbra people cough as if clearing their throats to show that they liked a song. I am actually serious!

The best places to listen to live fado are in the Alfama district, for example A *Baiuca* or *Grupo Excursionista Vai Tu*, where the locals will often sing along with the artist. As a tourist you might stick out a little, but the Lisboners gathering there will certainly appreciate your interest in Portugal's most popular musical genre. Please make sure you don't have one port wine too many and start mistaking it for a karaoke bar, though, because fado is NOT, and I cannot stress this often enough, the Portuguese version of your take on "Love me tender". Let's all agree on that.

- **Mosaic sidewalks**

When walking through Lisbon you will notice the beautiful mosaics on the sidewalks, particularly on the big boulevards. Legend has it that when Vasco da Gama returned from India, Manuel I. commissioned the first mosaic sidewalks to make sure that a man of da Gama's importance would not have to walk across dirt streets. Sure beats a red carpet, if you ask me.

Calçadas – the 18th century way of putting a little glamour in everyday life.

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