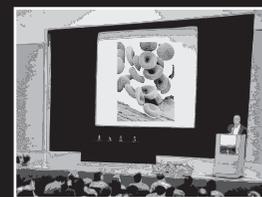


Conference Scene

CIRSE 2010 – helping minimally invasive therapy reach its maximum potential



Cardiovascular and Interventional Radiological Society of Europe Congress Valencia, Spain, 2–6 October 2010

The annual Cardiovascular and Interventional Radiological Society of Europe (CIRSE) congress is Europe's most influential interventional radiology platform, and 2010 was no exception. With over 5600 attendees traveling to the host city of Valencia, it once again set records. The high attendance is representative of the meeting's scientific importance – CIRSE 2010 also featured a broader scientific program than ever, with record numbers of scientific submissions and educational workshops.

Neurointerventions

Amongst the many trends presented at the meeting, of particular note was the new neurointerventions track. This was introduced to reflect the growing role of interventional radiology (IR) in managing neurological disease and stroke, and to show how improved diagnostic imaging can allow for a more tailored treatment approach to neurological emergencies.

Stroke represents one of the main causes of morbidity and mortality in industrialized countries, and is now an accepted medical emergency where treatment is possible by a number of methods. The role of imaging, as well as evaluation and knowing the correct indications, has become essential as quick treatment is the key to adequate management. These topics were addressed in a dedicated session 'Essentials of acute stroke management: imaging and indications'. Another session was dedicated to 'Essentials of acute stroke management: treatment'. The session opened with an update on intravenous and intra-arterial thrombolysis from Ethem Murat Arsava, from Ankara, Turkey. Arsava outlined the current use of intravenous recombinant tissue plasminogen activator (rtPA), which can obtain good results up to 4.5 h following the ischemic event. However, this treatment is not effective in treating proximal occlusions, and he therefore recommends using intra-arterial thrombolysis for all patients with proximal occlusions, with unsuccessful recanalization after intravenous thrombolysis or presenting outside the window of intravenous thrombolysis. A pilot study has shown the feasibility and safety of intra-arterial treatment after intravenous rtPA, and the ongoing

multicenter, randomized IMS-III trial is now testing the efficacy of this approach versus intravenous rtPA alone.

Mechanical revascularization was addressed by Hans Henkes. Henkes gave a comprehensive overview of the mechanical revascularization options currently available – aspiration, enhanced aspiration (ThromCat™), clot retrievers (including stent-structured retrievers), self-expanding stents, balloon dilation, balloon-expandable stents, crossing stents and temporary stenting. Mechanical thrombectomy (MT) is possible using any of the above methods, or a combination, but treatment has to be individualized and remains technically demanding. Henkes believes that MT is the future of endovascular stroke treatment.

The complications that can arise from intravenous stroke treatment were addressed by Thomas Mayer from Jena, Germany. Successful revascularization depends on the correct technique and tool being chosen for the occlusion site and type, which may be determined based on CT/MR imaging, angiography and peri-interventional findings. Secondary thrombosis may occur if arteriosclerosis is present or thrombocyte inhibition is insufficient, which should be measured. Dissection can be caused by the catheter, microcatheter, wires, rigid spiral retriever, retraction of a captured device, or proximal and intradural suction. Vessel rupture may be due to microwire and microcatheter perforation, balloon hyperinflation or pre-existing dissection (or even aneurysm). Late recanalization, hyperperfusion and fibrinolytics can cause intracranial or subarachnoid hemorrhage (ICH and SAH) in infarcted tissue. Anticoagulation and platelet inhibition have to be adjusted;

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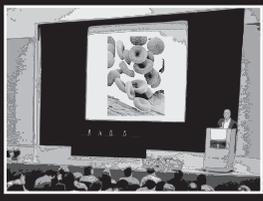
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if possible, heparinization after intervention should be avoided. Blood pressure has to be managed according to recanalization status. Fast and complete recanalization may prevent hemorrhage.

Spinal interventions

Given the controversy that has surrounded spinal interventions in 2009 [1,2], it is to be expected that these controversies were discussed at CIRSE 2010. The 'Update on spine interventions' session delivered the latest data on this field. Hendrik Fransen opened with updates on the latest trials. Following on from the good results of the Vertos I trial, the Vertos II study was started in 2003: a multicenter prospective double-blind prospective randomized study comparing vertebroplasty with conservative treatment. The inclusion criteria included vertebral compression fracture (type A.1–3.1), local back pain for 6 weeks or less, bone edema (MRI), osteopenia or osteoporosis (T score: -2.5), and age greater than 50 years. The study concluded that vertebroplasty was not a risk factor for new osteoporotic compression fractures, and produced significant pain relief with very low complication rates – similar to the Fracture Reduction Evaluation (FREE) clinical trial results. The full results of Vertos II were presented at a separate session at CIRSE.

New devices for vertebral augmentation were evaluated by Giovanni Carlo Anselmetti of Candiolo, Italy. Despite the recent controversies regarding the *New England Journal of Medicine* articles [1,2], both vertebroplasty and kyphoplasty are currently applied in Europe due to the favorable clinical outcome reported by treated patients. Many new devices have also been developed to reduce the risk of cement leakage complications and to significantly restore initial vertebral height. High viscosity polymethylmethacrylate is one such development, and is now widely used for vertebroplasty procedures. Viscosity can also be increased using radiofrequency assistance, which heats the tip of the needle constantly. Anselmetti believes that generally, an experienced interventional radiologist with high-quality imaging systems can perform a satisfactory vertebroplasty procedure without new devices; however, they can be of use in selected cases.

Francisco Aparisi, Valencia, Spain, discussed percutaneous posterior element devices in the treatment of degenerative disease, the most common cause of back pain. The development of minimally invasive spine surgery has been a major benefit to patients suffering from this complaint, and in the future, interventional radiology may have a role to play, either as part of a team approach or in training hybrid specialists.

The complications of vertebroplasty were presented by Alexis Kelekis, Athens, Greece. The complication rate for bone augmentation ranges from 1 to 10% – material failures are rare, and technical complications are mainly related to leakage of bone cement, more frequently in metastatic lesions. Most leakages result from overzealous complete vertebral body filling. It is important to note that if significant neurological compromise were to occur, surgical colleagues must be available for immediate consultation or intervention. Vertebroplasty should therefore only be performed at sites where surgical back-up is available. Inappropriate needle positioning is another cause of complications. Procedural complications related to anesthesia and radiation exposure must also be borne in mind. By recognizing and avoiding the potential pitfalls described above, operators will markedly decrease their complications. Kelekis recommends the 'Standards for the performance of percutaneous vertebroplasty' produced by CIRSE, the Society of Interventional Radiology (North America) and the American College of Radiology.

Interventional oncology

Interventional oncology is a rapidly growing subspecialty of IR, and featured prominently in the scientific program. A session of particular note was 'Interventional oncology at the cellular level', in which the latest findings of the most prominent interventional oncology researchers were presented.

In 'Tissue changes after ablation', Constantinos Sofocleous of the Memorial Sloan-Kettering Cancer Center, NY, USA, discussed the value of tissue examinations after ablation. Radiofrequency ablation of liver malignancies is recognized to be a safe and effective treatment option. One important limitation, however, remains the difficulty of margins evaluation following the treatment, and this is the next consideration

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for ablation research. Tissue examinations from ablated tumors can be used as prognostic biomarkers of outcomes and identify patients at risk for local tumor progression after treatment. The development and improvement of these tissue examinations can be used to identify patients at risk who may benefit from additional treatment prior to the imaging evidence of recurrent disease. The development of new methods to evaluate treatment effectiveness upon completion is of paramount importance for the development of ablative therapies as an alternative to open surgery.

Laura Crocetti, Pisa, Italy, gave a presentation on 'How to increase cellular death in local treatment'. With radiofrequency and microwave ablation, convection-induced heat loss (due to blood circulation) can significantly reduce the extent of thermally induced coagulation. Several strategies for reducing blood flow during ablation therapy have been proposed, such as total portal inflow occlusion (Pringle maneuver), percutaneous occlusion of portal or hepatic vein, angiographic balloon catheter occlusion of the hepatic artery and embolization of the tumor-feeding artery. Recently, a strategy to utilize the large zones of sublethal heating, created during radiofrequency application in tissues surrounding the electrode, has been developed. Experimental studies show that the cell death temperature threshold can be lowered by combining sublethal temperatures with chemotherapeutic agents, with tumor necrosis thus occurring at 45–50°C. In a pilot study, intra-arterial drug-eluting bead administration substantially increased the effect of radiofrequency ablation and did not cause any major complications.

Riccardo Lencioni, also from Pisa, spoke about the latest findings on 'Irreversible electroporation' (IRE). IRE is a method to induce irreversible disruption of cell membrane integrity resulting in cell death. IRE creates a sharp boundary between the treated and untreated area *in vivo*, suggesting that treatment planning can be performed with mathematical precision. IRE can effectively create tissue death in micro- to milli-second ranges of time – markedly faster than conventional ablation techniques. As a nonthermal technique, complete ablation to the margin of blood vessels is achievable without compromising

the functionality of the blood vessels. Thus, IRE represents a promising new method of ablation.

Occupational hazards & radiation dosage

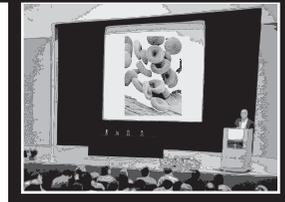
As with any professional medical practice, health and safety standards are an integral part of interventional radiology. 'Occupational hazards in IR' addressed many of the more common problems faced by interventional radiologists, and provided succinct advice on how these challenges may be best overcome.

While cases of radiation overdoses are thankfully rare, they are nonetheless an issue that should be carefully considered before performing any imaging procedure. The possible shortfalls and their solutions were discussed by two esteemed speakers, Efstathios Efstathopoulos, a medical radiation physicist from Athens, Greece, and Gabriel Bartal, an interventional radiologist from Kfar-Saba in Israel.

The rising popularity of IR procedures brings with it the attendant challenge of ensuring radiation safety for both patient and practitioner. The patient remains the main source of scattered radiation for the practitioner, thus ensuring low patient dose can also lead to safer working conditions. Lower fluoroscopy time and dosage, beam collimation, rigorous planning, dedicated and well-maintained equipment, and thorough training can all help lower the dose delivered. Medical simulators are advised as a means of lowering dosages – the more familiar the practitioner is with the technique and/or anatomy of the patient, the quicker the procedure can be completed.

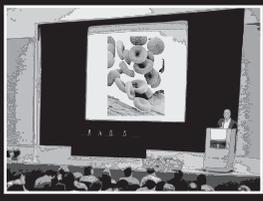
Interventional radiologists are also recommended to make use of protective shielding, such as lead aprons, collars and glasses, bearing in mind that they should also cover the interventional radiologists' left side; suspended ceiling screens; table-mounted lead curtains (which should be tested regularly); and disposable protective drapes (expensive, but recommended where the interventional radiologists' hands are exposed to the radiation field). They are also recommended to use dosimetry measures, to archive fluoroscopy runs and to pulse fluoroscopy.

Bartal then presented a related paper, 'Incidence, prevention and management of musculoskeletal pain in IR'. While the



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leaded protective equipment required and recommended can reduce dose exposure, it can add significant strain to the practitioner's body. When considering that interventional radiologists will spend years of their careers standing for hours at a time in unergonomic positions, wearing heavy protective apparel, it is not surprising that many develop musculoskeletal problems. In a web-based survey of 424 interventional cardiologists, 42% reported spinal problems, and 28% reported hip, knee or ankle problems. Spine problems were related to annual procedural caseload and number of years in practice. A third reported that their spinal problems had caused them to miss work. Other studies have reported similar findings.

The problem of heavy protective apparel is aggravated by the location and height of monitors. These can cause additional strain to both the neck and eye muscles of the operator. Improper table height also feeds this problem. Current technology can place staff at risk of upper extremity musculoskeletal disorders, such as carpal or cubital tunnel syndromes.

However, 'weightless aprons' have become available – Bartal demonstrated a home-made lead-apron suspension system that carried much of the weight for him. He also gave several tips for how to reduce strain to the spine and skeleton: use a belt to help support the weight; use a two-part lead apron rather than a head-to-toe apron that hangs from the shoulders; where possible, use a hanging device to support the weight of the apron; place one foot on a short stool under the fluoroscopy table; adjust the height of the monitor to suit the operator; and to protect the eye muscles from computer vision syndrome – look to a distance of 20 feet for 20 s every 20 min.

The 'Medicolegal aspects in IR' were discussed by Peter Reimer. It is every practitioner's duty to obtain proper informed consent from the patient, at least 24 h before the procedure and before any sedation has been given. This is to ensure both that the patient has a proper understanding of all their options and what they are agreeing to, and to ensure that in the event of any complications, legal liability is limited. Complications cannot always be avoided, and it is important that patients affected should feel that the medical team

involved is acting professionally. Should a legal claim arise, having robust documentation of all interactions with the patient should help protect you – hospital administration should be involved and insurance companies should be informed.

These sessions were just a few examples of the wealth of scientific content made available at CIRSE 2010. The program also contained many other sessions, vascular and nonvascular, oncologic and clinical, as well as hands-on workshops, foundation courses, free papers and panel discussions. Some further highlights this year included a joint session with the European Society of Anaesthesiology and the Latin American Society for Interventional Radiology (SIDI), as well as joint workshops with the European Federation of Radiographer Societies. Following the success of the 2009 venture, Health Economics lectures were offered once again, and many cutting-edge scientific developments were addressed. Many of the presentations are available on the Education in Interventional Radiology (ESIR) website [101], and many more breaking developments are foreseen for CIRSE 2011 in Munich, 10–14 September – we look forward to seeing you there!

Financial & competing interests disclosure

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript.

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References

- 1 Kallmes DF, Comstock BA, Heagerty PJ *et al.*: A randomised trial of vertebroplasty for osteoporotic spinal fractures. *N. Engl. J. Med.* 361 (6), 569–579 (2009).
- 2 Buchbinder R, Osborne RH, Ebeling PR *et al.*: A randomised trial of vertebroplasty for painful osteoporotic vertebral fractures. *N. Engl. J. Med.* 361(6), 557–568 (2009).

Website

- 101 Education in Interventional Radiology Online
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