Highlights of the scientific meeting of the 18th Annual Congress of the European Society of Skeletal Radiology (ESSR) 2011

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Introduction

The 18th Annual Congress of the ESSR was hosted in Greece, on the beautiful island of Crete, 9–11 June 2011, with nearly 500 registrants present. The congress president was Prof Apostolos Karantanas. The meeting followed the same format as previous years with a musculoskeletal ultrasound course on the first day. The remaining 2 days of the meeting comprised the refresher course which concentrated on the topic of bone marrow disorders, with further focus sessions including arthritis, intervention, sports imaging, tumours and advances in MSK imaging. Fifty papers were accepted for presentation in the scientific sessions, with a further 77 papers accepted for the electronic poster exhibition. The abstracts for the scientific papers were published in the June 2011 edition of *Skeletal Radiology* [1]. This article summarises the highlights of the scientific program.

Joint imaging

This year's ESSR/ISS prize-winning abstract by Dietrich et al. described the normal variant of the supra-acetabular fossae (SAF) in the hip, which was found in 10% of MR studies and subsequently confirmed at arthroscopy. Two types are described: SAF-1, which fills with contrast on arthrography, and SAF-2, which is filled with cartilage. Knowledge of these lesions can prevent misdiagnosis of an osteochondral defect [2]. On a similar theme of normal

variants, the different ossification patterns encountered in the femoral condyles of children and adolescents were described [3]. These lesions should not be confused with pathological processes such as osteo-chondritis dissecans, a topic that was also discussed by Professor Klaus Bohndorf in the Founders lecture at the ISS meeting in San Diego, 2011.

A variety of other papers were presented focusing on imaging technique and applications. A small pilot study of T2* relaxation times of the menisci of the knee showed correlation with subjective grading scores for meniscal degeneration. However, further studies are required to determine if this finding is predictive of future meniscal tears [4]. Other technique-based abstracts assessed the reliability of 3D imaging for assessment of joints. Fast 3D MRI of the knee with PD SPAIR sequence was shown to be sensitive and specific for meniscal and ligament injuries compared with arthroscopy as a gold standard [5]. A normal volunteer study of foot MRI demonstrated that 3D SPACE imaging with multi-planar reformats is superior to three-plane orthogonal proton density MR imaging in demonstration of the Lisfranc ligaments [6]. The use of such 3D sequences with multi-planar reformation is becoming part of routine practice and, when used to replace standard sequences, allows for significant time savings in MR examinations.

Tumours

A retrospective review of 195 patients with chondrosarcoma (CS) assessed the impact of whole-body bone scintigraphy on initial surgical staging [7]. No cases of skeletal metastases were recorded in the study group. Multifocal CS was diagnosed in three patients. However, in two cases this was diagnosed on the initial MR staging exam, and in the third

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case this had a limited impact on the surgical staging. The authors concluded that routine whole-body isotope bone scanning has no role in initial tumour staging for CS.

Two studies addressed the perennial difficulties of distinguishing benign from malignant soft tissue tumours. One paper assessed the influence of myxoid matrix on the ADC values of tumours on diffusion-weighted MR imaging at 3 T. The results suggest that although ADC values alone do not distinguish benign from malignant lesions, there are statistically significant differences between the ADC values of benign and malignant tumours when the myxoid and non-myxoid sub-groups are analysed independently [8]. However, conventional radiological interpretation remains the most useful for evaluating soft tissue masses. In a retrospective review of MR imaging of 138 benign and malignant superficial soft tissue masses, the authors demonstrated a significant relationship between malignancy and tumour lobulation, hemorrhage, fascial edema and necrosis. However, tumour size alone was not a predictive factor [9].

The winner of the ESSR Tumor Prize this year was awarded to Tsifountoudis et al. for their pictorial review of tumour and tumour-like lesions of Hoffa's fat pad, which was presented in the electronic poster exhibition. The article combined excellent MR images with arthroscopic and histological illustrations [10].

Rheumatology

Arthritis was a popular theme with several papers presented on the subject of contrast-enhanced US of synovitis (CEUS). Wick et al. demonstrated good to excellent interobserver agreement for a subjective four-point scoring system of synovial thickness and intensity of vascularisation. There was also excellent correlation with an objective quantification system calculating signal intensity on CEUS [11]. Another study showed that CEUS time intensity curves can reliably quantify synovitis and that "time to peak" and "area under the curve" calculations correlate with clinical and biological signs of inflammation [12]. CEUS was also shown to be significantly more sensitive than power Doppler US (PDUS) in demonstrating peri- and intra-tendinous vascularity in wrist tenosynovitis, with excellent interobserver variation utilising a three-point grading system [13]. Such results are encouraging and give credence to the use of CEUS as an alternative image modality to MRI for longitudinal studies in arthritis.

Two studies evaluated the use of contrast-enhanced MRI (CEMRI). Platzgummer et al. showed that half dose Gd (Multihance) correlates well with full dose CEMRI and can sufficiently depict synovitis in early rheumatoid arthritis [14]. In the second paper, diffusion-weighted MRI correlated well with CEMRI for depiction of acute enthesal

lesions in ankylosing spondylitis. However, it is noteworthy that all lesions were also depicted as high SI on STIR imaging without contrast [15].

Cartilage imaging remains a popular avenue of research in arthritis. 3D deformation maps of articular cartilage in MRI of the knee following standardised loading regimes can show predictable deformation patterns [16]. Such techniques may contribute to the development of biomechanical models of the knee and help to predict stress-induced degeneration and osteoarthritis.

Osteoporosis and bone marrow imaging

Several papers were presented that reflected the main subject matter of the refresher course. Two studies described the potential use of MR spectroscopy in quantifying bone marrow fat content. A study of 80 volunteers evaluating ¹H spectroscopy of hips in male and female subjects showed that the fat content differed predictably across various sites around the hip [17]. The spectroscopic conversion index showed a statistically significant difference between men and women in most age groups, but further studies are required to assess the value of this technique for pathological conditions around the hip. In another paper, the association between marrow fat content, abdominal adipose tissue, lumbar spine bone mineral density (BMD) and blood biomarkers in females with type II diabetes mellitus was assessed using proton spectroscopy (¹H-MRS). A high correlation was noted between vertebral bone marrow fat and HbA1c, suggesting that bone marrow fat may be a biomarker for the extent of glycemic control in diabetics [18].

Fracture prediction in osteoporosis was addressed in two papers using quantitative CT. A longitudinal study showed that BMD derived from sagittal reformations of the spine from routine contrast-enhanced CT of the abdomen could predict incidental osteoporotic fractures of the spine [19]. A smaller study of volumetric BMD using high resolution quantitative CT suggested that a different pattern of bone loss occurs in lung transplant patients than that found in patients with typical post-menopausal or age-related osteoporosis [20]. Optical flow deformation models allow recognition of morphological features such as trabecular thickness and spatial re-organisation. In the future computer-based analysis may help predict osteoporotic fracture in high-risk populations.

Tendon and soft tissue disease

A work in progress of sonoelastography in patients with Charcot arthropathy showed progressive loss of elasticity

over time in the plantar fascia of patients affected by diabetes mellitus [21]. However, it has yet to be shown whether these changes pre-date the radiological manifestations of arthropathy. Another study suggested that sonoelastography of the plantar fascia correlates favourably with conventional US in diagnosis of plantar fasciitis [22]. However, the clinical impact of sonoelastography remains controversial.

A 5-year longitudinal study of patellar and Achilles tendon in asymptomatic elite rugby players demonstrated that focal hypoechoic lesions and areas of microcalcification present on initial imaging all progressed in size and number at 5 year follow-up [23]. These findings emphasise the need to carefully correlate radiological and clinical findings.

A wide spectrum of other abstracts were also presented during the scientific sessions over the course of the ESSR meeting, including several papers on interventional techniques, and MRI and US imaging of other joint and soft tissue pathology. Further details are available for review in the published abstracts [1].

Prize-winning presentations and E posters

ESSR/ISS Prize for Best Scientific Paper

- TJ Dietrich et al. Switzerland. Supra-acetabular fossa (pseudo-defect of acetabular cartilage): morphology at MR arthrography

ESSR Tumor Prize

- I Tsifountoudis et al. Thessaloniki, Greece. MR imaging of tumors and tumor-like lesions of Hoffa's fat pad

Poster Prizes

- P. Mercouris. Durban, South Africa. MRI of SLAP lesions: a pictorial review of imaging and anatomy with arthroscopic correlation
- E. Fabbro et al. Genoa, Italy. Dynamic ultrasound evaluation (HRUS) of the hip: a detailed didactic approach
- V. Skiadis et al. Athens, Greece. Anterior knee pain. A pictorial essay

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