



# Highlights of the Annual Scientific Meeting of the Society of Skeletal Radiology (SSR) 2018, Austin, Texas, USA

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## Introduction

The Society of Skeletal Radiology (SSR) held its 2018 annual meeting at the JW Marriott Austin in Austin, TX, from March 25–28, 2018. The meeting was attended by 334 society members and 56 members in training.

## Scientific program

A total of 118 abstracts were submitted by SSR members for consideration, reflecting their active clinical research. From these submissions, the program committee selected 57 abstracts for oral presentation and inclusion in the scientific program. Abstracts were presented by major topic, including Emerging Technologies, Upper Extremity, Intervention/Post-Operative, Hip/Pelvis, Trauma/Miscellaneous, Tumor, and Lower Extremity. In total, over 30 h of AMA category 1 continuing medical education (CME) credits were offered with the scientific program available at <https://skeletalrad.org/sites/default/files/documents/SSR%202018%20Program%20Book%20-%20FINAL.1%203-19-18%20-%20REDUCED.pdf>. In addition, 51 electronic scientific and educational posters (ePosters) were available for review at the meeting. These ePoster presentations are accessible to SSR members at <http://ssrannualmeeting.conferencespot.org/>.

The SSR hosted the 7th annual hands-on musculoskeletal (MSK) ultrasound (US) tutorial session, which was once again attended by a capacity group of 62 radiologists. The focus of

the US session was imaging of the hip. For the 13th consecutive year, 3 h of self-assessment modules (SAMs) were offered and were attended by a majority of the meeting participants.

While the general meeting abstracts were presented by subject matter as listed above, the meeting highlights are more easily summarized by themes or emphasis, as noted below. The vast majority of the presentations were related to shoulder, tumor, hip, and knee imaging as well as interventional procedures. Excellent presentations regarding imaging of other joints and the spine were also presented.

## Summary of the meeting highlights

### Shoulder

An increased incidence of convex remodeling of the posterior or posterior-superior glenoid on magnetic resonance imaging (MRI) in professional baseball players compared to controls was described by radiologists from the Cleveland Clinic [1]. Radiologists from New York University (NYU) recommended using the mid-glenoid (50%) level to measure for glenoid retroversion since this location was the most reproducible; however, they found that measuring glenoid version at any level between 25 and 75% of the glenoid height is accurate [2]. Mayo Clinic Arizona (MCA) radiologists reported that the sensitivity, specificity, and accuracy of detecting rotator cuff tears on MRI in patients with calcific tendinosis was much lower than that reported in the literature in patients without calcific tendinosis. This reduction in sensitivity, specificity, and accuracy was not present when using magnetic resonance arthrography (MRA) [3]. The use of the teres major as a way to normalize the quantification of rotator cuff atrophy was shown to be effective by radiologists from Northwestern University [4].

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## Wrist

Radiologists from the University of Arizona used diffusion tensor imaging and ultrasound to study patients with carpal tunnel syndrome (CTS) and found that the presence of nerve hyperemia and the nerve cross-sectional area at the level of the hamate were the most significant variables in differentiating patients with CTS from controls [5]. The addition of a distal radioulnar joint injection to the standard radiocarpal injection for wrist MRA was found by radiologists from the University of Michigan to not alter surgical management [6].

## Pelvis/core muscle

Patients with MRI findings compatible with ischiofemoral impingement (IFI) were examined by radiologists from St. Paul's Hospital in Vancouver, British Columbia. These radiologists were able to correlate patient symptoms with various hip positions using dynamic ultrasound, and concluded that dynamic ultrasound may be a useful tool in evaluating patients with IFI [7]. University of Wisconsin radiologists reported that over 20% of patients with core muscle injuries also had pubic bone fractures; however, no correlation existed between fracture presence and size of the aponeurotic plate injury suggesting an associated but unique injury mechanism [8].

## Hip

NYU radiologists studied patients with femoral acetabular impingement and reported that 3D MRI agreed with 3D CT in 100% of cases with respect to presence and location of a “cam” lesion, ~ 90% agreement for the anterior iliac spine morphology and ~ 65% agreement for the femoral neck-shaft angle and lateral center-edge angle. They concluded that 3D MRI could supplant 3D CT in this patient population [9]. Radiologists from Columbia-Presbyterian medical center studied patients being screened for femoral “cam” lesions and found that a two-view (AP pelvis and Dunn hip) hip series had a similar sensitivity for detecting femoral “cam” morphology compared to a five-view hip series (AP pelvis, AP hip, Dunn hip, frog lateral hip, false profile hip) [10]. A strong association between higher grades of post-operative heterotopic ossification (HO) and a longer time interval between injury and surgery (6 days or more) was reported by a group led by radiologists from Stony Brook medical center [11].

## Knee

An association between the development of perimeniscal scarring and the lack of worsening chondrosis on follow-up MRI exams performed at least 6 months after the diagnosis of a medial meniscal tear was reported by radiologists from Thomas Jefferson University [12]. A team of radiologists led

by Emory University studied patients with knee subchondral insufficiency fractures and found that patients with high-grade lesions more often had medial meniscal tears, severe meniscal extrusion, marrow edema progression, and severe chondrosis [13]. Johns Hopkins University radiologists showed that a fully automated 3D TSE MRI protocol using CAIPIRINHA SPACE allowed for high-resolution imaging of knees in pediatric patients in less than 10 min with high accuracy for meniscal, ligamentous, and cartilage abnormalities [14].

## Ankle

Radiologists from the University of Arizona defined the normal ultrasound shear wave elastography velocities for the anterior talofibular and the calcaneofibular ligaments in young healthy male patients both at rest and with applied stress and found that velocities increased significantly with stress [15].

## Tumor

Radiologists from both the American Institute of Radiologic Pathology (AIRP) and MCA reviewed 17 pathologically confirmed cases of pleomorphic liposarcoma and reported that nearly two-thirds of the tumors were intramuscular with 90 and 80% having heterogeneous low to intermediate T1-weighted and T2-weighted signal, respectively. They also found hemorrhage in 60% and fat signal in ~ 80% of the tumors; however, the fat constituted less than 25% of tumor volume in 80% of cases [16]. Intravenous gadolinium contrast administration improved the sensitivity for detecting locally recurrent soft tissue sarcomas as reported by radiologists from the University of Texas M.D. Anderson Cancer center [17]. Both functional MRI (diffusion weighted imaging and ADC mapping) and <sup>18</sup>F-FDG-PET/CT imaging were found to be sensitive for characterizing peripheral nerve sheath tumors as benign or malignant; however, the use of functional MRI offered greater specificity compared to PET/CT [18].

## Interventional

Radiologists from the AIRP reported that sampling of suspected areas of tumor necrosis in addition to the solid tumor component was required to more accurately grade soft tissue malignancies with necrosis as some tumor classification systems (i.e., The French Federation Grading (FNCLCC) System) use necrosis for staging [19]. Massachusetts General Hospital radiologists reported that there was a greater likelihood of culturing the causative microorganism in patients with discitis-osteomyelitis when the CT-guided biopsy was performed with a 13-gauge or larger needle [20].

## Miscellaneous topics

A team of radiologists led by Mayo Clinic Florida studied 2015 Medicare claims data and found that ~ 50% of the current SSR membership had greater than 50% of billing claims linked to MSK service codes using the Niemen Imaging types of service [21]. However, nearly 46% of the current SSR membership were identified as “generalists,” no specialty with > 50% of billing claims identified, but ~ 37% of those “generalists” performed a plurality of their work in MSK [21]. Thomas Jefferson radiologists reported that increased risk of developing pedal osteomyelitis correlated with a marrow to fluid region of interest (ROI) ratio of greater than 50% on T2 fat-suppressed or short-tau inversion recovery (STIR) imaging and a reduced distance between the ulcer and underlying bone compared to those patients that did not develop osteomyelitis [22].

## Award-winning presentations

While many paper presentations were noteworthy, two papers were selected for presentation at upcoming meetings. The paper selected for presentation at the 2018 Radiological Society of North America meeting in Chicago, IL, was entitled “Brown Adipose Tissue and Cancer Activity” presented by Miriam Bredella [23]. The paper selected for presentation at the 2018 International Skeletal Society meeting in Berlin, Germany was entitled “Pacinian Corpuscles: Bright Palmar Blind-Spots on MRI” presented by Nicholas Rhodes [24]. The Patrick T. Liu Innovation in Research Award was presented to Robert Lopez for the presentation “Intramuscular botulism toxin Type A (BTA) injection facilitates abdominal wall reconstruction (AWR) of recurrent large-defect hernias” [25]. The 2018 SSR Seed Grant Research award went to Naven Subhas for “Highly accelerated knee MRI using a novel deep convoluted neural network algorithm: A multi-reader comparison study.”

## Young investigator awards

Six young investigator awards were selected this year. The awards went to the following scientific presentations: “T2 Mapping of articular cartilage of the normal pediatric knee” by Hailey Allen [26]; Textural 3-T measurements of proximal femur bone quality as biomarkers of fracture risk” by Kate Harrington [27]; Diagnostic utility of lavage for periprosthetic joint infection: Are the culture results reliable?” by Dana Lin [28], “Carved in Bone: The calcaneal crescent in patients with and without plantar fasciitis” by Palanan Siriwanarangsun [29]; “Optimizing bone marrow lesion detection using dual-energy CT: A phantom study” by Ramya Srinivasan [30]; and

“Ultrasound-guided aspiration of intramuscular hematomas: Efficacy and relationship to sonographic appearance” by Edward Yoon [31].

## ePosters

ePosters were a prominent part of the educational experience with 51 available for review on multiple wide-screen displays for the duration of the 4-day meeting. The American College of Radiology (ACR) Education Center Award for the Best Education Poster was awarded to presenters from the University of Michigan for the presentation entitled “Imaging of ankle impingement” [32]. The American Institute for Radiologic Pathology (AIRP) Award for Best Scientific Poster was won by presenters from the University of Utah for the presentation entitled “MRI of the lumbosacral plexus: What the practicing radiologist needs to know” [33].

## Summary

Scientific papers covering a wide range of MSK topics with new information related to imaging findings, imaging techniques and interventional procedures were presented. A large number of ePosters were again available for review on large screen monitors, significantly adding to the information available to the meeting participants. Two well-received afternoon SAM focus sessions were again offered, as was a hands-on MSK US tutorial specific to imaging the hip, which was attended by a capacity crowd.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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**The 41st annual SSR meeting will be held at the J.W. Marriott Scottsdale Camelback in Scottsdale, Arizona from March 10–13, 2019.**