

Teaming Up for MSK Care: An Interprofessional Approach

Imaging Update Workshop

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Imaging of the musculoskeletal system often involves a multimodality approach involving a combination of conventional radiography, computed tomography (CT), ultrasound, magnetic resonance imaging and nuclear scintigraphy. Each modality has its strengths and weaknesses and part of the challenge involves utilization of the appropriate diagnostic test in a given clinical case. The aim of this workshop is to highlight the relative merits and drawbacks of the different modalities in assessment of disorders of the musculoskeletal system.

General radiography is by far the commonest form of imaging in musculoskeletal radiology particularly in the setting of trauma, arthritis, prior instrumentation. Even in more complex clinical problems x-rays are often the appropriate initial investigation. The main advantages of plain films are that they are fast, inexpensive, and readily available but involve ionizing radiation and only provide very limited information regarding the soft tissues.

CT uses higher doses of ionizing radiation but in return provides cross-sectional capabilities particularly suited to evaluation of complex osseous abnormalities such as complex fractures. Although depiction of soft tissues is better than conventional radiographs, it remains suboptimal in comparison with US and MRI.

US is primarily suited to evaluation of soft tissue abnormalities including tendinous, ligamentous and muscular injuries. Advantages of US include accessibility, tolerability, relatively quick examination times and dynamic assessment of structures. However, it is very operator dependent and of little utility in assessment of bones or in presence of generalized symptoms.

MRI provides the most comprehensive assessment of disorders of the musculoskeletal system but is expensive, suffers from long examination times in a confined space and is contraindicated in some individuals including those with pacemakers and neurostimulators. It is ideally suited for evaluation of internal derangement of joints and in assessment of the spine. It may be supplemented with arthrography to provide information regarding the status of osteochondral surfaces and labroligamentous structures.

Nuclear medicine is the most common form of functional imaging, providing a highly sensitive assessment of the entire skeleton by assessing bone turnover. As such it has been used in trauma, arthritis, musculoskeletal infections, neoplastic disorders and metabolic conditions. However, its high sensitivity is hampered by a relatively low specificity and as such is often complimentary to other modalities.

The above points will be illustrated with a set of clinical scenarios.