

# Imaging the painful hip in adults



**H**ip pain in adults can pose a conundrum to the examining physician because, more often than not, the clinical signs and symptoms can be vague and non-specific. Aspects of the clinical history that may be helpful include the patient's age, relevant trauma (inclusive of mechanism), pain location, nature and chronicity, drugs (e.g. steroids), pre-existing medical conditions (e.g. known arthropathies) and pregnancy status.



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Ultimately the clinical thought process, in the context of the history and examination, should aim to stratify aetiology into three broad categories:

1. Intrinsic hip pathology
2. Para-articular pathology
3. Referred pain

Radiological imaging can then be tailored to confirm or exclude the presumptive diagnoses. The spectrum of imaging modalities available include plain films, ultrasound, CT, MRI and bone scintigraphy.

## Intrinsic Hip Pathology

This is best divided into anatomical components; bone and marrow pathology, disorders of the labrum and the arthritides (cartilage, synovial and joint capsule pathology).

The osseous and marrow pathologies include fractures, bone contusions, transient osteoporosis of the hip, avascular necrosis developmental dysplasias, infection and bone tumours. Labral disorders largely pertain to labral tears +/- paralabral cyst formation. Important arthritides include degenerative osteoarthritis, inflammatory (e.g. rheumatoid arthritis) and infective causes (e.g. septic arthritis). Synovial proliferative disorders like PVNS (pigmented villonodular synovitis) require mention, but are uncommon. Intra-articular loose bodies are most commonly due to degenerative disease but may be traumatic or synovial in origin (e.g. synovial chondromatosis). Plain films remains the bastion of preliminary imaging being diagnostic in fractures, degenerative osteoarthritis, hip dysplasias and valuable in characterising bone tumours. Plain film changes may, however, manifest late in the disease process of avascular necrosis, osteomyelitis or inflammatory arthropathies as compared to other imaging modalities available (e.g. MRI or bone scintigraphy). MRI is an excellent overall imaging modality diagnosing occult fractures, bone

contusions, synovial proliferative disorders (e.g. PVNS) and transient osteoporosis of the hip, a disorder seen in women, typically in the peri-partum period as well as males in their 3rd and 4th decades. MR arthrography is utilised to best discern acetabular labral tears.

The utility of CT and ultrasound in intrinsic hip pathology is limited. CT is easily accessible to determine subtle fractures. CT arthrography is rarely performed primarily because MR arthrography provides significantly more information of the hip joint and para-articular structures. Ultrasound easily identifies joint effusions, particularly helpful if the concern of septic arthritis is raised and if an image guided aspirate is subsequently required.

## Para-articular Pathology

This group largely encompasses musculotendinous strain injuries and bursal pathology. The strain injuries include tendinopathy, tears and avulsion injuries which, around the hip, most often involve

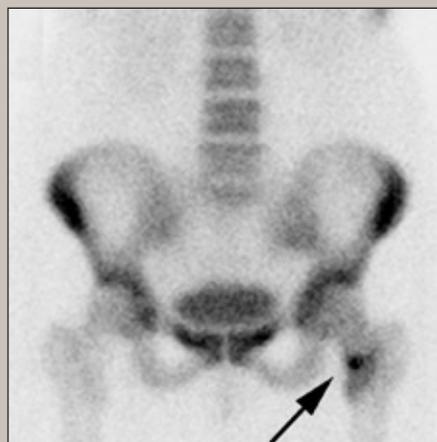
the gluteal, hamstring and rectus femoris tendons. Para-articular bursal pathology include trochanteric and iliopsoas bursitis. MRI is sensitive in assessing and characterising para-articular pathology. Ultrasound is a robust imaging modality but is user dependent and may be difficult in the larger body habitus patients. CT has almost no role other than for extra-articular fractures. Bone scintigraphy is not indicated in this group, although extra-osseous soft tissue uptake is occasionally discovered incidentally.

## Referred Hip Pain

This is a large group which include pain referred from the lumbar spine, sacrum, pelvis, groin and knee.

## Conclusion

Hip pain is a common clinical presentation. By considering aetiology in the proposed three major categories (intrinsic hip pathology, para-articular pathology and referred pain), radiological imaging can be tailored accordingly.



■ Figure 1. Increased osteoblastic activity in the base of the left femoral neck in keeping with a stress fracture. (Courtesy of Dr. Peter Robins)



■ Figure 2. Increased signal in the right trochanteric bursa in keeping with trochanteric bursitis. (Courtesy of Dr Michael Krieser)