Specialty area: MRI of Musculoskeletal Impingement Syndromes

Title of Talk: Hip: Femoral-Acetabular & Ischiofemoral Impingment

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Key concepts:

- Femoroacetabular Impingment (FAI) is an important cause of hip pain and premature osteoarthritis. Controversies still exist in terms of optimal treatment and patient selection for surgery.
- FAI can be caused by abnormal morphology of the acetabulum (pincer type) or proximal femur (cam type).
- MRI is validated in the evaluation of abnormal hip morphology as well as joint damage due to FAI, including labral detachment/tear/degeneration and articular cartilage injury
- Iliopsoas impingement can be distinguished from FAI on MRI by the location of labral injury
- Ischiofemoral impingment is manifest on MRI as abnormal signal intensity in the quadratus femoris muscle

Abstract

MRI is used to assess the morphology of the painful hip, labral injuries and hyaline cartilage injuries. Labral injury includes labral detachment, longitudinal and radial tears and degeneration. Labral injury can be mimicked by sublabral sulci, but they can be distinguished based on MRI findings. Cartilage injury usually occurs in the acetabular rim, adjacent to the labrum, and includes fissuring, full-thickness loss and delamination. Cartilage damage is probably a predictor of poor outcomes, but this has not been validated in the literature.

Most centers perform MR with direct arthrography. MR arthrography is highly accurate, but associated with a significant rate of post-procedure pain. Indirect arthrography or non-contrast MR are alternative methods of evaluation. Whatever method is chosen, MRI should be performed with high-resolution surface coil and small FOV. Images should be obtained in the coronal, sagittal, axial and oblique axial (axis of femoral neck) planes. MR arthrogram should include T1 weighted images with and without fat suppression, as well as fluid sensitive sequences in 2 planes. Labral tears usually occur in the anterosuperior quadrant, and are often difficult to see on coronal images. Sagittal and oblique axial images are most reliable in detecting labral tears. Sagittal PD images are most reliable in detecting acetabular cartilage damage. MR tends to underestimate damage to the femoral head articular cartilage.

MRI has an important role in assessment of hip pain after FAI surgery. Causes of pain after surgery include inadequate resection of the impingement lesion, recurrent labral tear, adhesions, stress fracture, progressive osteoarthritis, instability, or avascular necrosis.

Iliopsoas impingement is the entity formerly known as snapping hip syndrome. Abnormal MRI signal intensity is usually not seen in the muscle or tendon. The diagnosis can be suggested on MRI when there is a tear of the labrum at the 3 or 9 o'clock position, i.e., directly anterior.

Ischiofemoral impingement is an uncommon entity. The quadratus femoris muscle is impinged between the ischium and the lesser trochanter. It may occur after total hip arthroplasty, or may be seen in the native hip. Abnormal signal intensity is seen in the quadratus femoris and also often in the hamstring muscles.

MRI reports should include: superior acetabular version, proximal femoral morphology and alpha angle, morphology and extent of labral injury, hyaline cartilage injury, bone marrow abnormalities, fibrocystic change, muscle and tendon abnormalities.

Target audience: Radiologists interpreting hip MRI

Outcomes/Objectives: Awareness of concepts and controversies in field of hip impingements. Knowledge of MRI techniques, findings and potential pitfalls. Knowledge of complications of arthrography and arthroscopy.

References:

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