FEMOROACETABULAR IMPINGEMENT

Essay

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DEDICATION

To my parents, thank you for your support and unfailing encouragement.

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Glossary

a	Body weight moment arm
ACD	Acetabular Cartilage Delamination
AIIS	Anterior Inferior Iliac Spine
ASIS	Anterior Superior Iliac Spine
b	Abductor muscle moment arm
FAI	Femoroacetabular Impingement
GRE	Gradient Echo
K	Body weight
LFCA	Lateral Femoral Circumflex Artery
M	Abductor muscle force
MFCA	Medial Femoral Circumflex Artery
NSAIDs	Non Steroidal Anti-Inflammatory Drugs
OA	Osteoarthritis
ROM	Range Of Motion
SCFE	Slipped Capital Femoral Epiphysis
T1WI	T1 Weighted Image
T2WI	T2 Waited Image
THA	Total Hip Arthroplasty

Introduction

In 1974, Stulberg1 noted the association between subtle anatomic abnormalities of the hip and the development of osteoarthritis (OA). This report was one of the earliest descriptions of what is now referred to as femoroacetabular impingement (FAI). Harris reviewed 75 patients with idiopathic OA in 1986 and showed that 80% had a subtle femoral or acetabular abnormality. It was not until more recently, after 2000, that the majority of literature regarding FAI was published **[1].**

FAI results from morphological abnormalities of the proximal femur and/or acetabulum which produce abnormal abutment of the acetabular rim and femoral head-neck junction. This mechanical abutment is most pronounced with hip flexion and internal rotation, and can be associated with pain, articular cartilage disease, labral abnormalities, and progressive secondary OA **[2].**

The most common classification system is based on a review of 600 surgical dislocations performed by Ganz and coworkers. They classified FAI as either cam (femoral- based) or pincer (acetabular - based) type **[3].**

Cam impingement is seen more commonly in the young athletic male and occurs as a result of an abnormally shaped femoral head repeatedly impinging upon an acetabulum that cannot accommodate the increased radius of the femoral head. The repeated abutment of this abnormally shaped femoral head on the labro-

chondral junction generates shear forces in this region which in turn may lead to a labral tear, labro-chondral separation, articular cartilage peeling off the bone and in the longer term osteoarthritis. The labral and chondral lesions are often observed in the anterosuperior area of the acetabulum **[4].**

Pincer-type impingement on the other hand is more commonly seen in athletic middle-aged women. The primary pathology here is of the acetabulum with a resultant over coverage of the femoral head leading to abutment of the femoral head-neck junction on the acetabular rim in flexion. The anterior labrum is the most commonly affected region although a contrecoup phenomenon has been described with chondral injury seen in the posteroinferior region of the acetabulum **[4].**

Carful history and physical examination are the first steps in diagnosis of FAI. Patient is usually a young active adult with slow onset of groin pain that may start after minimal trauma. The pain is frequently exacerbated by athletic activities that demand deep hip flexion, or by prolonged walking, sitting or driving. Examination of the hip often reveals limitation of movement particularly internal rotation and adduction in flexion. Impingement test is positive **[5].**

FAI imaging is carried out nowadays using different techniques. Inspite of using of different imaging modalities such as MRI, arthrogram and CT scan; the use of plain radiography still provides the surgeons with valuable data concerning the diagnosis, etiology and detection of any other associated hip joint anomalies **[6].**

Non-operative treatment encompasses rest, activity modification, anti-inflammatory medications, physical therapy and corticosteroid injection **[7].**

Surgical treatment has been utilized to improve the clearance for motion at the hip joint and lessen the femoral thrust against the acetabular rim. Three surgical approaches are commonly used to accomplish the goals of surgical intervention; an open approach, arthroscopy or arthroscopy with a limited open approach (mini-open). In advanced degenerative joint disease prosthetic replacement surgery is the treatment of choice **[8].**

Relevant Anatomy of the Hip Joint

The hip is a true ball and socket joint surrounded by powerful and well-balanced muscles, enabling a wide range of motion in several physical planes while also exhibiting remarkable stability **[9].**

For ease of approach, this chapter is discussed under the headings 'Bony anatomy', 'Ligaments and capsular anatomy' , 'Neurovascular anatomy ' and 'Muscular anatomy' **[9].**

BONY ANATOMY

The hip joint may be described as consisting of **(Figure 1):**

- The cup shaped acetabulum.
- Femoral head, which forms slightly more than half of a sphere.
- The cylindrical femoral neck which attaches the head to the femoral shaft **[10].**

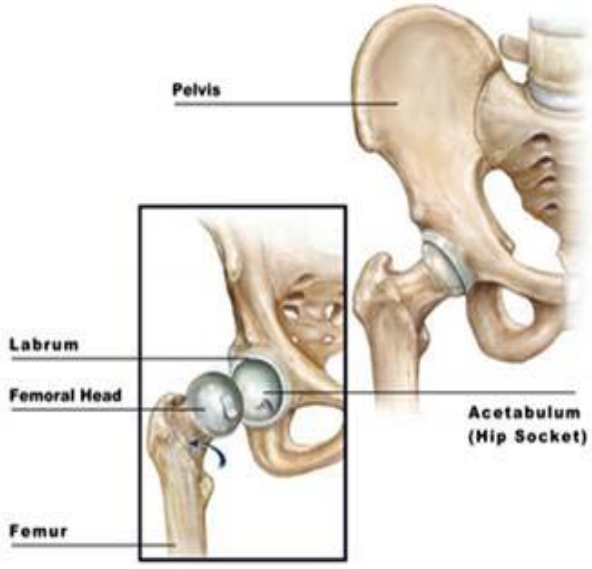

Figure (1): The bony anatomy of the hip joint **[11].**