Arthroscopic Management of Extra-articular Hypertrophy of the Anterior Inferior Iliac Spine Apophysis Resulting in Hip Impingement: A Case Report

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Introduction

Femoroacetabular impingement (FAI) is described as a disorder at the femoral neck and acetabular rim junction.[1] While the majority of this pathology is the result of intra-articular abnormalities, extra-articular sources can also result in impingement type symptoms and dysfunction.[2-5] Hypertrophy of the anterior inferior iliac spine (AIIS) has been described as a potential source of extra-articular hip impingement.[6] Etiology of AIIS hypertrophy includes excessive congenital bone formation at the AIIS apophysis or the result of avulsion-type injuries of the direct head of the rectus femoris tendon.[7] Bone hypertrophy in this location can result in impingement type symptoms and lead to FAI related pathology including dysfunction of the hip joint including labral tears, acetabular cartilage damage and cystic bone changes in the femoral neck. As a result, surgical decompression can be indicated in the setting of AIIS hypertrophy and FAI related symptoms and pathology. Three types of AIIS morphology have been described including type 1 (distal AIIS ends proximal to acetabular rim), type 2 (distal AIIS extends to the acetabular rim), and type 3 (distal AIIS extends beyond the acetabular rim), where increasing subtypes are associated with worse clinical symptoms and related hip joint pathology.[8]

Both open and arthroscopic techniques have been described.[6,9,10] While open approaches have definite utility, arthroscopic techniques allow the surgeon to address the offending pathology while minimizing surgical morbidity.[11] In addition, arthroscopy enables the surgeon to address both extra and intra-articular pathology on both the femoral and acetabular side of the hip joint without significant difficulty and with little exposure or trauma to the joint and capsule.[11] In this case report, we describe a patient who underwent arthroscopic decompression and osteoplasty to manage hip impingement secondary to both intra- and extra-articular morphology.

Case Report

A 23-year-old male military cadet presented to our clinic complaining of 8 months of progressively worsening right hip pain. The patient noted sharp, sustained pain localized in the hip/groin region that appeared to be associated with long periods of walking/marching and running. Patient did not mentionany specific history of trauma or other injury to the hip region but did note that he had been active throughout his life. Physical exam noted pain with hip flexion, internal rotation, and abduction. Patient had limited hip flexion to 105°.

Plain x-rays including anterior-posterior view of the pelvis, and anterior-posterior and lateral views of the hip were performed (Figure 1). These demonstrated a large bony prominence at the level of the AIIS as well as a small femoral neck CAM deformity. In addition, cystic changes at the femoral head/neck junction were also identified. The joint space about the femoroacetabular articulation was well preserved and there were no other notablesurrounding osseous abnormalities. In addition to the hypertrophic bone changes at the level of the AIIS, an MRI also demonstrated evidence of anterosuperior labral tearing.

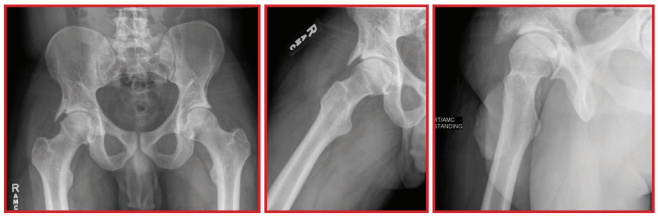

Figure 1: Plain x-rays of pelvis and right hip, pre-operative

Initially non-operative treatment was offered including activity modification, non-steroidal anti-inflammatory drug regimens, and intra-articular joint injections. Unfortunately these did not effectively relieve his symptoms particularly the intra-articular steroid injection, which

did not provide any noticeable pain relief or restoration of function.[11]

Due to continued limitations with activity and significant right hip pain, the patient elected to proceed with arthroscopic surgery. Using standard anterolateral and mid anterior arthroscopic portals the patient underwent resection of the AIIS prominence, femoral neck osteoplasty, anterior rim trimming and labral debridement. After a capsulotomy was performed, a large, non-mobile bone fragment was encountered that was found to overhang the joint by 2-3 centimeters, consistent with type 3 AIIS morphology.[8] Full exposure of the fragment was carried out and it was removed in a piecemeal fashion using and arthroscopic burr (Figure 2). Visual feedback and assessment of the amount of resection was aided by intraoperative fluoroscopy. Post-operative x-rays demonstrated interval removal of the AIIS hypertrophic bone spur as well as post-operative changes consistent with femoral neck osteoplasty (Figure 3).

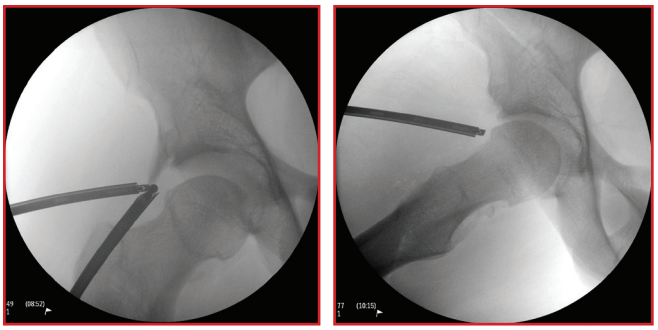

Figure 2: Intraoperative x-rays of right hip

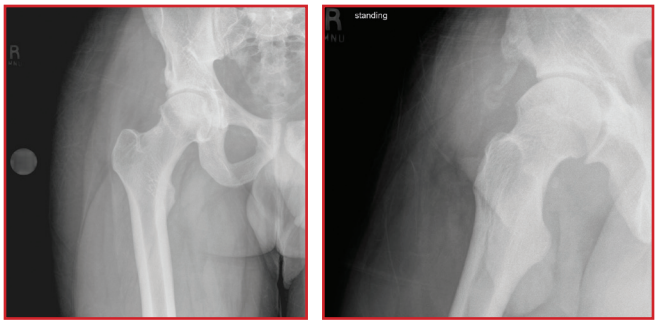

Figure 3: Plain x-rays of right hip, post-operative

Post-operatively, the patient underwent directed rehab including physical therapy and exercise biking. Patient's range of motion continued to progress post-operatively and hip pain substantially decreased compared to pre-operative levels. Follow-up and re-introduction of full range of activities is ongoing.

Discussion

FAI is a condition that is the most common mechanism behind early cartilage and labral damage in the non-dysplastic hip.[1] Early diagnosis and management is important in terms of hip preservation and limiting the amount of early degenerative changes that are often part of the spectrum of sequelae that characterize the clinical picture of FAI. Commonly, bony changes and congenital abnormalities at both the femoral and acetabular sides contribute to FAI pathology. 86% of patients presenting with FAI have a combination of cam and pincer type impingement.[12] More commonly, morphological changes contributing to FAI are intra-articular, however extra-articular abnormalities can also contribute to overall pathology including hypertrophy at the AIIS as described above. As illustrated in this case, it is important to assess those common intraarticular changes that contribute to FAI in the setting of obvious extra-articular abnormalities in order to manage all potential contributing factors to the overall clinical picture. As presented here, the patient had an obvious extra-articular bone spur resulting from a presumed rectus femoris avulsion injury, as well as a small cam deformity that may have also been a factor in the development of resulting joint damage including tearing of the labrum and grade 3 chondromalacia at the acetabular rim. Both potential factors were addressed arthroscopically, hopefully improving the likelihood of a good post-operative outcome and limiting continued degeneration of the hip joint.

Surgically, both arthroscopic and open approaches have been described to address extra-articular causes of hip impingement with good success.[13] Arthroscopy is particularly appealing in terms of limiting surgical morbidity including major complications.[14] Exposure and visualization are reasonable arguments for pursuing open approaches. As demonstrated in this case, however, we were able to address pathology on both the femoral and acetabular side of the joint relatively easily as well as being able to tackle both intra and extra-articular causes of FAI. This was accomplished relatively routinely with standard hip arthroscopy portals and patient positioning. This case, while certainly not unique in its presentation and resulting surgical intervention, does provide continued evidence of the utility of hip arthroscopy in trained hands to manage FAI pathology on both the femur and acetabulum whether or not the morphology is inside or outside of the joint.

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