[Orthopaedic Surgery]

Lumbo-Pelvic-Hip Complex Pain in a Competitive Basketball Player: A Case Study

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Establishing the cause of lumbo-pelvic-hip complex pain is a challenge for many clinicians. This case report describes the mechanism of injury, diagnostic process, surgical management, and rehabilitation of a female high school basketball athlete who sustained an injury when falling on her right side. Diagnostics included clinical examination, radiography of the spine and hip joint, magnetic resonance imaging arthrogram, 3-dimensional computed tomography scan, and computed tomography of the hip joint. A systematic multidisciplinary clinical approach resulted in the patient's return to previous functional levels.

Keywords: hip pain; acetabular labral tear; hip arthroscopy; low back pain

Differentiating the origin of pain in an individual with lumbo-pelvic-hip complex pain often requires a detailed and collaborative effort among treating clinicians. As many as 60% of patients requiring hip arthroscopy are initially misdiagnosed for an average of 7 months.⁶ Distinguishing the various causes of nonarthritic hip pain is sometimes difficult.

Patients presenting with a limp are 7 times more likely to have a hip or hip/spine disorder than a spine problem.³ Groin pain or limited internal rotation of the hip is more predictive of a hip disorder and a hip/spine disorder (7 and 14 times, respectively) than a spine disorder.³

One potential cause of hip and groin pain, especially in the athlete, is femoroacetabular impingement (FAI). The conceptual model of FAI implies abnormal contact between the femur and the acetabular rim at the end range of hip motion—particularly, flexion—resulting in the development of chondral lesions, labral tears, and progressive osteoarthritis.^{7,10} Cam and pincer impingement have been described as the 2 primary subtypes of FAI, although a combination of both has also been described as a mixed cam-pincer impingement.²

CASE PRESENTATION

A 17-year-old female elite high school junior basketball athlete (1.73 m, 66 kg, body mass index = 22.1 kg/m²) was involved in

a collision during a basketball game, landing on her right hip. Her primary complaints were as follows: right lower back and groin pain, feeling like her back “popped,” burning pain in the right anterior-superior thigh, and occasional catching/clicking in her right hip/buttock region. There were also complaints of pain (8 on a scale of 10) as a result of jogging the day before initial examination, an antalgic gait pattern on the involved right side, and pain with range of motion (ROM) of the lumbo-pelvic-hip complex. Due to the patient's acute pain level, she did not practice for the next week.

The neurologic examination yielded negative results. The lumbar/pelvic girdle examination led to a focus on the hip joint (Figure 1).

Hip strength was 3 (out of 5) for abduction and 4 for extension, compared to 4 for strengths on the left hip. Internal rotation ROM was 15° on the right and 30° on the left. Clinical testing for FAI and most labral tear tests yielded positive results.

Right hip radiography, magnetic resonance imaging arthrogram (MRA), and 3-dimensional computed tomography suggested pincer impingement with cam lesion (Figure 2) and a tear of the superior labrum. Rehabilitation primarily addressed restricted hip internal rotation and hip/trunk weakness for 6 weeks, until surgical consultation.

Intra-articular injection of 3 mL of Marcaine (bupivacaine hydrochloride) and 80 mg of Depo-Medrol (methylprednisolone

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Figure 2. Three-dimensional computed tomography scan image illustrates the cam lesion (arrows).

Figure 3. Anterior portal view of labrum and grade III chondromalacia. Viewing the right hip from the anterolateral portal, a probe is introduced from the anterior portal. The labrum (white asterisk) is intact, without evidence of pathologic pincer impingement. Grade III chondromalacia of the adjacent acetabular surface (black asterisk) indicates damage from cam impingement.

acetate) was performed to confirm the diagnosis of intra-articular hip joint pathology. Complete (albeit temporary) relief of symptoms led to surgical consultation. Surgical intervention was recommended due to the recalcitrant nature of the patient's complaints, temporary complete relief of symptoms with intra-articular injection, as well as lack of significant improvement with physical therapy. At operation, the acetabular labrum was intact without pathologic pincer impingement. Articular cartilage breakdown of the anterolateral acetabulum was seen (grade III; Figure 3) with cam-type impingement. Chondroplasty of anterior acetabulum and synovectomy of acetabular fossa were performed, followed by femoroplasty for cam impingement.

Initial rehabilitation consisted of controlled weightbearing with crutches (4 weeks), soft tissue mobilization, hip joint mobilizations (grades I and II), hip flexor and anterior/posterior hip joint stretching, progressive strengthening initiated with isometrics, and ROM in pain-free ranges. Once full weightbearing was well tolerated, exercises were slowly advanced to progressive resistive weightbearing, proprioceptive and balance exercises, and sport-related stretching and strengthening exercises. Hip mobilizations were progressed to grades III and IV for restricted ROM.

A slow return to competitive basketball was allowed approximately 4 months after hip surgery. At the last clinic visit, 6 months after surgery, the patient scored 96 on the modified Harris Hip Score,⁸ had normal ROM and strength, and passed all functional testing. The patient was consulted via phone 20 months after surgery and was continuing with competitive basketball without complaints.

DISCUSSION

The extent to which components of the lumbo-pelvic-hip complex contribute to pain in one of the other areas is complex and has only moderate-level evidence.¹⁸ Due to the patient's history of spondylolysis, lumbar spine examination was necessary. Subjective and objective complaints were similar to those of the previous spondylolysis injury. Negative clinical/radiographic findings of the spine suggested the hip joint as the primary pain generator.

Results of hip impingement testing were positive. Subjective complaints of groin pain,^{4,11,12} groin clicking and catching,^{11,15,19} and positive clinical test results of the hip joint all supported potential labral tear pathology. Right hip MRA and additional radiographic measurements suggested hip impingement with labral tear and apparent crossover sign with mixed cam-pincer impingement (Figure 3).

Surgical results supported the examination findings except for the lack of a labral tear. Labral tears identified on MRA may not be a major contributor to patients' pain complaints.¹² Labral pathology can be overinterpreted on MRA.⁵ Significant pain relief with hip injection suggests intra-articular pathology.¹¹ This patient had almost 2 weeks of complete relief.

The articular cartilage lesion was not visualized with imaging. Such lesions are commonly seen during arthroscopic evaluations^{1,9,13,14,16} with cam lesions and often occur with anterior superior labral tears.²

The role of surgery for FAI in adolescents is unclear, with only 1 study demonstrating favorable results.¹⁷ These patients did not have articular cartilage lesions requiring treatment, however.

CONCLUSION

The arthroscopic approach to this hip joint chondral lesion and FAI led to this patient's successful return to previous activity levels.

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