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Management Approach of Femoralacetabular Impingement: Systematic Review

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Abstract: **Femoroacetabular impingement (FAI), previously called acetabular rim syndrome or cervicoacatebular impingement; is the main reason for early damage to the acetabular labrum and articular cartilage of the hip, especially in young, active patients and high-level professional athletes.**

The main objective of surgical treatment for this condition is to improve the clearance for motion at the hip joint and reduce the femoral thrust against the acetabular rim. Surgical treatments for dealing with FAI include arthroscopic or open surgery and hip replacement. Arthroscopic surgery includes the insertion of an arthroscope and little surgical instruments through several little skin incisions into the joint for evaluation, shaving of bone stimulates or removal of damaged cartilage as needed. Open surgery is carried out when big problems are present. Hip replacement is essential when no articular cartilage exists.

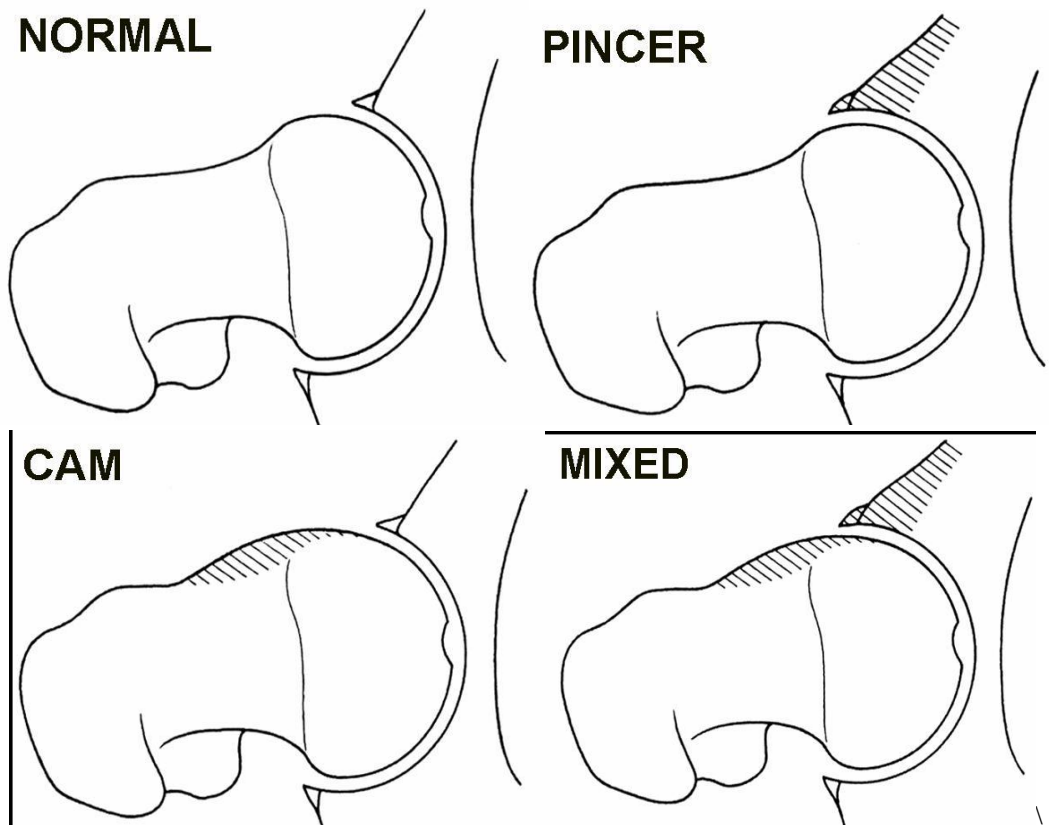
Our main objective was to provide a systematic review of the treatment outcome studies investigating the open, mini-open, and arthroscopic methods and to provide some comparisons between these current surgical options for managing FAI.

Keywords: **Femoroacetabular impingement (FAI), Arthroscopic Methods.**

1. INTRODUCTION

Femoroacetabular impingement (FAI), formerly called acetabular edge condition or cervicoacatebular impingement is the significant source of extremely early damages to the acetabular labrum and also articular cartilage material of the hip, especially in young, top-level professional athletes and also energetic people. In people with FAI, restriction of both flexion and also inner turning occur at the hip joint as an outcome of early pathologic hire between the skeletal value of the thigh as well as the acetabulum(1).

FAI provides with hip and groin pain as well as reduced range of motion. Three mechanisms of FAI have been classically explained; cam, pincer, and combined(see the figures below) Cam is the femoral head asphericity and malformed femoral head-neck junction with decreased offset. Cam sores are more frequently seen in males. The acetabular injury pattern consists of labral damage and cartilage delamination through shear forces at the abutment between the unusual femoral head-neck junction "cam" and the acetabular rim (2).Pincer defects, result from excessive acetabular protection secondary to deep sockets (coxa profunda and protrusio), increased anterior acetabular protection and true acetabular retroversion. A pincer impingement compresses the labrum in between the acetabular overcoverage and the femoral neck with hip range of movement (3). Integrated deformities are a mix of these 2 mechanisms and are the most common version of FAI (4,5).



FAI generally occurs in one joint; however, in rare cases both hips can be involved. The earlier FAI is diagnosed, the more successful the treatment and retardation of degeneration.

Initially, the patient is managed with medical treatment. Conservative measures, including physical therapy, restriction of activities, core strengthening, improvement of sensory-motor, and control and nonsteroidal anti-inflammatories (NSAIDs) are the mainstays of nonsurgical treatment [(6)].

Surgical intervention may be indicated if the patient ends up being refractory to medical management.

Surgical treatment has been utilized to improve the clearance for motion at the hip joint and reduce the femoral thrust against the acetabular rim.

Three surgical approaches are typically used to accomplish the objectives of surgical intervention; an open method, arthroscopy or arthroscopy with a restricted open method (mini-open).

The appropriate surgical strategy depends on the kind of impingement, the extent of damage, the labral and cartilage pathology, and the physician/patient preferences and preferred outcomes[(7)].

The main objective is to provide a systematic review of the treatment outcome studies investigating the open, mini-open, and arthroscopic methods and to provide some comparisons between these current surgical options for managing FAI. We hypothesized that the arthroscopic and mini-open procedures offer similar outcomes to the historic gold standard of open dislocation surgery in the management of symptomatic FAI.

2. METHODOLOGY

Four databases were selected to ensure a comprehensive review of the literature: PubMed, EMBASE, Ovid, and the Cochrane Review. On January 25, 2014, a total of 13 different queries were used for each engine: (1) “femoroacetabular impingement ORFAI,” (2) “hip impingement,” (3) “cam impingement,” (4) “pincer impingement,” (5) “surgical dislocation AND impingement,” (6) “osteotomy AND impingement,” (7) “hip AND treatment AND impingement,” (8) “hip arthroscopy,” (9) “mini-open,” (11) “osteochondroplasty,” (12) “osteo- plasty AND impingement,” and (13) “rim trimming.” A hand search of the tables of contents of relevant journals published from January to December 2015 was then performed .

3. RESULTS AND DISCUSSION

Open incision, restricted open method (mini-open), and arthroscopy are established surgical approaches for the treatment of FAI. Significant enhancements in activity level, pain scores, and variety of motion, in addition to absence of impingement pain have actually been regularly reported following surgical intervention for FAI that is nonresponsive to medical management.

Khan et al. [8] (2016) carried out a methodical extensive evaluation in duplicate of Arthroscopy and The American Journal of Sports Medicine (AJSM) from February 2012 to February 2015 for all short articles connected to Femoroacetabular Impingement (FAI). A variety of patients in 104 research studies were consisted of in this review. The modified Harris Hip Score (mHHS) mean values after arthroscopic surgery for FAI showed improvements at the midterm from 60.5 points to 80.5 mention of a possible 100 points. The outcomes for labral repair showed mean mHHS improvements from 63.8 points preoperatively to 86.9 points up to 24 months postoperatively. The authors concluded arthroscopic intervention leads to improvements in functional outcomes at both the midterm and short-term for clients with symptomatic FAI in the lack of significant existing degenerative modifications. Labral repair may result in enhancements over labral debridement. The primary constraint of this research study is the possible threat of predisposition in the findings from restricting this review to 2 journals. This however was done to enable a contrast in the quality and content between these publications.

Collins, et al. [9] (2015) performed an organized evaluation of the literature to identify if prophylactic surgical intervention for asymptomatic patients with radiographic evidence of FAI is called for to prevent early degenerative joint disease of the hip. Inclusion criteria were prospective or retrospective research studies comparing skeletally mature asymptomatic patients with radiographic evidence of FAI treated with prophylactic hip arthroscopic surgery versus nonoperative management. As none of the references fulfilled the eligibility criteria, they conclude that existing proof does not support prophylactic surgical treatment for asymptomatic FAI in the large bulk of cases. They also determined that limited proof recommends that asymptomatic patients who have actually formerly gone through overall hip arthroplasty for FAI-induced osteoarthritis of the contralateral hip are at a considerably increased danger for early degenerative joint disease. Additional research is needed through well-conducted medical trials to better clarify surgical indicators for prophylactic surgical intervention of patients with asymptomatic FAI.

As well as Larson et al.[10-11] (2016) carried out a cohort study that included 77 patients (88 hips). Dysplastic radiographic findings were retrospectively reviewed at a mean follow-up of 26.0 months after hip arthroscopy. Specific procedures consisted of labral repair (76%), labral debridement (23%), capsular repair/plication (82%), and femoral osteochondroplasty (72%). Pre- and postoperative function were examined prospectively with the customized Harris Hip Score (mHHS), 12- Item Short Form Health Survey, and visual analog scale for pain. The results of the dysplastic accomplice were compared with an accomplice of 231 hips without radiographic dysplasia that underwent arthroscopic Femoroacetabular Impingement (FAI) correction throughout the study period. At the time of final follow-up, the dysplastic associate showed a mean mHHS of 81.3 with a mean 15.6-point improvement in mHHS, compared with 88.4 and 24.4 points, respectively, in the FAI friend. The dysplastic friend had 60.9% good/excellent outcomes and 32.2% failures, compared to 81.2% good/excellent results and 10.5% failures for the FAI accomplice. Failure was defined as a mHHS $\leq$ 70 or ultimate pelvic/femoral osteotomy or overall hip arthroplasty. Dysplastic hips that underwent capsular plication and labral repair work had higher good/excellent results (73%) and suggest newest mHHS (85), along with lower failure rates (18%) compared to the remainder of the dysplastic cohort. The authors concluded that arthroscopic management of moderate to moderate acetabular dysplasia had inferior good/excellent outcomes and higher failure rates when compared with an FAI mate; for that reason, separated arthroscopic treatments in this population must be very carefully considered. Labral repair work and capsular plication resulted in much better scientific outcomes.

4. CONCLUSION

The open dislocation, mini-open, and arthroscopic techniques for dealing with symptomatic FAI are effective in improving pain and function in short-term to midterm studies and are reasonably safe procedures.

Because of trochanteric osteotomy related concerns, the historical gold standard of open dislocation surgical treatment had a relatively high major complication rate primarily. The mini-open technique showed equivalent effectiveness but a considerable incidence of iatrogenic injury to the LFCN in some studies. When performed by experienced cosmetic surgeons, the arthroscopic technique had surgical outcomes equivalent to or much better than the other techniques with a lower rate of major complications.

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