FEMOROACETABULAR IMPINGEMENT SYNDROME (FOR TENNESSEE ONLY)

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APPLICATION

This Medical Policy applies to Medicaid only plans in the state of Tennessee.

COVERAGE RATIONALE

Surgical treatment for femoroacetabular impingement (FAI) syndrome is proven and medically necessary when the following criteria are met:

- Pain unresponsive to non-surgical management (e.g., restricted activity, nonsteroidal anti-inflammatory drugs)
- Moderate-to-severe symptoms typical of FAI (persistent hip or groin pain that limits activity and is worsened by bending of the joint such as squatting or prolonged sitting)
- Positive impingement sign (i.e., sudden pain on 90 degree hip flexion with adduction and internal rotation or extension and external rotation)
- Imaging studies (X-rays, MRI or CT scans) confirming FAI (e.g., pistol-grip deformity, alpha angle greater than 50 degrees, coxa profunda, and/or acetabular retroversion)
- Do not have advanced osteoarthritis (i.e., Tönnis Grade 2 or 3) and/or severe cartilage damage (i.e., Outerbridge Grade III or IV)

DEFINITIONS

Outerbridge Grades:
- Grade 0: Normal
- Grade 1: Cartilage with softening and swelling
- Grade II: Partial-thickness defect with fissures on the surface that do not reach subchondral bone or exceed 1.5 cm in diameter
- Grade III: Fissuring to the level of subchondral bone in an area with a diameter more than 1.5 cm
- Grade IV: Exposed subchondral bone head

Tönnis Classification of Osteoarthritis by Radiographic Changes:
- Grade 0: No signs of osteoarthritis (OA)
- Grade 1: Increased sclerosis of femoral head or acetabulum, slight joint space narrowing or slight slipping of joint margin, no or slight loss of head sphericity
- Grade 2: Small cysts in femoral head or acetabulum, moderate joint space narrowing, moderate loss of head sphericity
• Grade 3: Large cysts, severe joint space narrowing or obliteration of joint space, severe deformity of the head, avascular necrosis (Clohisy, 2010)

APPLICABLE CODES

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by federal, state or contractual requirements and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Coverage Determination Guidelines may apply.

Coding Clarification: The specific codes for femoroacetabular impingement syndrome surgery listed should be used instead of 27299 and/or 29999.

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<tr>
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<tr>
<td>29914</td>
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<tr>
<td>29915</td>
<td>Arthroscopy, hip, surgical; with acetabuloplasty (i.e., treatment of pincer lesion)</td>
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<td>29916</td>
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DESCRIPTION OF SERVICES

Femoroacetabular impingement (FAI) is a condition in which extra bone grows along one or both of the bones that form the hip joint – giving the bones an irregular shape. Because they do not fit together perfectly, the bones rub against each other during movement. Over time this friction can damage the joint, causing pain and limiting activity.

There are three types of FAI: pincer, cam, and combined impingement.
• Pincer: This type of impingement occurs because extra bone extends out over the normal rim of the acetabulum. The labrum can be crushed under the prominent rim of the acetabulum.
• Cam: In cam impingement the femoral head is not round and cannot rotate smoothly inside the acetabulum. A bump forms on the edge of the femoral head that grinds the cartilage inside the acetabulum.
• Combined: Combined impingement just means that both the pincer and cam types are present.

The most common symptoms of FAI include:
• Pain
• Stiffness
• Limping

Pain often occurs in the groin area, although it may occur toward the outside of the hip. Turning, twisting, and squatting may cause a sharp, stabbing pain. Sometimes, the pain is just a dull ache. (OrthoInfo, 2016)

Conservative treatments for FAI include rest, modification and limitation of activities, anti-inflammatory medications, physical therapy, and injection of the hip joint with a steroid or analgesic. If these treatments fail to provide adequate relief, hip surgery may be indicated.

Several different types of arthroscopic surgery have been developed to reshape bone and remove or repair damaged cartilage with the goal of restoring normal hip function (Hayes, 2018).

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). The appropriate surgical technique depends on the type of impingement, the extent of damage, the labral and cartilage pathology, and the physician/patient preferences and desired outcomes (Barton, et al., 2009).

Components that may be performed during FAI surgery include but are not limited to:
• Removing the nonspherical sections of the femoral head and prominent sections of the anterior femoral neck (osteoplasty)
• Debridement of chondral lesions
• Labral debridement (resection) or labral repair (refixation or reattachment)
• Evaluation and repair of chondral defects using microfracture or drilling chondroplasty
• Excising bony prominence and reshaping the acetabular rim (NICE, 2011)

CLINICAL EVIDENCE

A systematic review and meta-analysis was conducted by Gohal et al. (2019) to assess the health-related quality of life (HRQL) outcomes after arthroscopic management of FAI. A total of 29 studies (24 case series, 3 case-control studies, 1 retrospective comparative study, and 1 RCT; some with control groups) were included for assessment. Of the 6476 patients (6959 hips), significant improvements were reported in all studies assessing generic HRQL outcomes, including the 12-Item Short Form Health Survey (range of mean postoperative scores, 82.2–89.8), and EuroQOL-5D scores (range of mean postoperative scores, 0.74–0.87) between 12 and 24 months postoperatively. Significant improvements were similarly identified in the hip-specific HRQL outcomes scores, with the majority of studies also reporting improvement between 12 and 24 months postoperatively. Mean improvement in International Hip Outcome Tool-33 scores from preoperative values to postoperative values ranged from 22.7 to 43.2, for studies with follow-up between 12 and 24 months. The authors concluded that hip arthroscopy can lead to significant improvement in generic and hip-specific HRQL outcomes at 12 to 24 months postoperatively in patients with FAI who do not have advanced hip osteoarthritis.

In a meta-analysis performed by Lei et al. (2019), the prognostic value of osteoarthritis (OA) on the overall failure rate, pain, and function of surgical management of femoroacetabular impingement (FAI) was evaluated. Seven studies were identified with 1,129 total patients, with 819 patients in the FAI group and 310 patients in the FAI with OA group. Pooled analyses showed that the overall failure rate was significantly higher in the FAI-OA group than in the FAI group. In addition, the rate of conversion to total hip arthroplasty was significantly higher in the FAI-OA group (37.3%) than in the FAI group (9.7%). The authors found that radiographic OA was correlated with higher failure rates, increased conversion to total hip arthroplasty, and worse outcomes after surgical management of FAI.

A two group parallel, assessor blinded, randomized controlled trial was performed by Palmer et al. (2019) to compare arthroscopic hip surgery with physiotherapy and activity modification for improving patient reported outcome measures in patients with symptomatic femoroacetabular impingement (FAI). Two hundred and twenty-two participants with symptomatic FAI were randomized (1:1) to receive arthroscopic hip surgery (n=112) or a program of physiotherapy and activity modification (n=110). Participants in the physiotherapy group received a goal based program tailored to individual patient needs, with emphasis on improving core stability and movement control. A maximum of eight physiotherapy sessions were delivered over five months. Participants in the arthroscopic surgery group received surgery to excise the bone that impinged during hip movements, followed by routine postoperative care. At eight months post-randomization, mean hip outcome score activities of daily living (HOS ADL) was 78.4 for patients randomized to arthroscopic hip surgery and 69.2 for patients randomized to the physiotherapy program. After adjusting for baseline HOS ADL, age, sex, and study site, the mean HOS ADL was 10.0 points (on a scale of 0-100) higher in the arthroscopic hip surgery group compared with the physiotherapy program group. This finding was statistically significant. No serious adverse events were reported in either group. There was no significant OA progression on plain radiography at an average of 11 years post-HA. The authors concluded that patients with symptomatic FAI referred to secondary or tertiary care achieve superior outcomes with arthroscopic hip surgery than with physiotherapy and activity modification.

A study was performed by Lee et al. (2019) to report the long-term follow-up results of arthroscopic repair of acetabular labral tears with femoroacetabular impingement (FAI). Forty-one patients were included in the analysis. Long-term follow-up results were compared with the previously reported short-term follow-up results of the same patients. The mean follow-up period was 92.4 months. The mean visual analog scale (VAS) score decreased from 6.4 points to 1.8 points, the mean modified Harris hip score (mHHS) increased from 59.5 points to 86.8 points, and the mean hip outcome score-activity of daily living (HOS-ADL) and hip outcome score-activity-sport-specific subscale (HOS-SSS) increased from 58.3 and 51.2, respectively, to 85.2 and 82.4, respectively, between the preoperative and last follow-up assessment. The mean patient satisfaction score was 7.6 of 10. The average Tönnis grade at the last follow-up was significantly different from the preoperative average. Only one case was converted to total hip arthroplasty because of progression of OA at 8 years after surgery. The authors concluded that the clinical and radiological long-term follow-up revealed that improvement after arthroscopic labral repair and osteoplasty for FAI were maintained in most cases without significant progression of arthritis. Anatomical recovery of the acetabular labrum was associated with the improvement of clinical symptoms.

Minkara et al. (2018) performed a meta-analysis and systematic review to evaluate risk factors and outcomes after arthroscopic management of femoroacetabular impingement (FAI), including return to play, revision rate, surgical and nonsurgical complications, change in α-angle, intraoperative bone resection, and patient-reported. A total of 1981 hips among 1911 patients were identified, with a mean ± SD age of 29.9 ± 1.9 years and 29.5 ± 14.0 months of follow-up. The incidence of bilateral FAI in these studies that required operative intervention was 3.6%. The pooled risk of
reoperation after hip arthroscopy, including revision surgery or subsequent total hip arthroplasty, was 5.5%. The risk of clinical complications was 1.7%. In total, 87.7% of patients demonstrated return to sport after surgery and all patient-reported outcomes improved postoperatively, with the highest increase observed in the Hip Outcome Score Sports scale (41.7 points). The α-angle decreased by an average of 23.6°. The authors reported that a high percentage of patients return to sport activities after hip arthroscopy for FAI, with a low rate of complications and reoperation. All patient-reported outcome measures, except for mental health, significantly improved after surgery.

Mansell et al. (2018) conducted a randomized controlled trial (n=80) to determine the comparative effectiveness of surgery and physical therapy for femoroacetabular impingement syndrome. The authors randomly selected patients to undergo either arthroscopic hip surgery (surgery group) or physical therapy (rehabilitation group). Patients in the rehabilitation group began a 12-session supervised clinic program within 3 weeks, and patients in the surgery group were scheduled for the next available surgery at a mean of 4 months after enrollment. Patient-reported outcomes of pain, disability, and perception of improvement over a 2-year period were collected. The primary outcome was the Hip Outcome Score (HOS; range, 0-100; 2 subscales: activities of daily living and sport). Secondary measures included the International Hip Outcome Tool (iHOT-33), Global Rating of Change (GRC), and return to work at 2 years. Statistically significant improvements were seen in both groups on the HOS and iHOT-33, but the mean difference was not significant between the groups at 2 years (HOS activities of daily living, 3.8; HOS sport, 1.8; iHOT-33, 6.3). The median GRC across all patients was that they "felt about the same" (GRC = 0). Two patients assigned to the surgery group did not undergo surgery, and 28 patients in the rehabilitation group ended up undergoing surgery. There was no significant difference between the groups at 2 years. Most patients perceived little to no change in status at 2 years. Limitations included a single hospital, a single surgeon, and a high rate of crossover.

Kierkegaard et al. (2017) conducted a systematic review and meta-analysis to investigate pain, activities of daily living (ADL) function, sport function, quality of life and satisfaction at different time points after hip arthroscopy in patients with femoroacetabular impingement (FAI). Weighted mean differences between preoperative and postoperative outcomes were calculated and used for meta-analysis. Twenty-six studies (22 case series, 3 cohort studies, 1 randomized controlled trial (RCT)) were included in the systematic review and 19 in the meta-analysis. ADL function improvements were first reported between 3 and 6 months and maintained through at least 3 years of follow-up. Sport function improvements were noted between 6 months and 1 year after surgery. On average, residual mild pain and ADL and sport function scores lower than their healthy counterparts were reported by patients following surgery. Postoperative patient satisfaction ranged from 68% to 100%.

A 2017 Hayes Medical Technology literature search identified 16 studies published from 2008 through 2016 comparing outcomes for varying forms of arthroscopic surgery for femoroacetabular impingement (FAI). Overall, the study results suggest that arthroscopic surgery for FAI is safe and improves hip function and reduces pain. Other than the evidence base comparing labral resection versus labral debridement, there is limited comparative evidence evaluating variations of arthroscopic surgical techniques or arthroscopic surgery relative to nonoperative management for FAI. Additional well-designed studies with long-term follow-up are needed to address uncertainty concerning the comparative efficacy and safety of arthroscopic surgery versus open surgery, variations of arthroscopic surgical techniques, and arthroscopic surgery relative to nonoperative management for FAI. An update literature search was performed on May 29, 2018 in PubMed which covers the period of March, 2017 to May, 2018. Three relevant newly published studies on FAI meet the inclusion criteria and did not change the study results.

The purpose of a cohort study (Sansone et al., 2017) was to report outcome 2 years after the arthroscopic treatment of femoroacetabular impingement (FAI) using validated outcome measurements. Two hundred and eighty-nine patients underwent arthroscopic surgery for FAI. The mean follow-up time was 25.4 months. Pre-operative scores compared with those obtained at follow-up revealed statistically and clinically significant improvements for all measured outcomes; International Hip Outcome Tool (iHOT-12) (43 vs 66), visual analog scale (VAS) for global hip function (50 vs 71), Hip Sports Activity Scale (HSAS) (2.9 vs 3.6), EuroQol (EQ-5D) index (0.58 vs 0.75), EuroQol visual analogue scale (EQ-VAS) (67 vs 75) and the Copenhagen Hip and Groin Outcome Score (HAGOS) different subscales (56 vs 76, 51 vs 69, 60 vs 78, 40 vs 65, 29 vs 57, 33 vs 58). At the 2-year follow-up, 236 patients (82%) reported they were satisfied with the outcome of surgery. The authors concluded that arthroscopic treatment for FAI resulted in statistically and clinically significant improvements in outcome parameters.

Khan et al. (2016) conducted a systematic comprehensive review in duplicate of Arthroscopy and The American Journal of Sports Medicine (AJSM) from February 2012 to February 2015 for all articles related to Femoroacetabular Impingement (FAI). A total of 4,131 patients in 104 studies were included 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 points out 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 results in improvements in functional outcomes at both the short-term and midterm for patients with symptomatic FAI in the absence of significant existing degenerative changes. Labral repair may result in improvements over labral debridement. The primary limitation of this study is the potential risk of bias in the findings.
from restricting this review to two journals. This however was done to allow for a comparison in the quality and content between these publications.

Fairley et al. (2016) conducted a systematic review to examine the evidence for surgical and non-surgical treatment of femoroacetabular impingement syndrome (FAI) on symptom and structural outcomes. Eighteen studies were identified comparing management strategies for FAI but no studies compared surgical and non-surgical treatment. Most studies had a high risk of bias. There was evidence that arthroscopy provided improved symptom outcomes compared to open surgery with labral preservation. There was some evidence that surgical interventions are effective in reducing alpha angle but no long-term outcomes data. The review found weak evidence that surgery was associated with structural progression of hip osteoarthritis. The authors concluded there is a lack of evidence for use of surgery in FAI and clarification of the role of non-surgical approaches vs surgery for the management of FAI is warranted.

A systematic review comparing outcomes of labral debridement/segmental resection with labral reconstruction as part of a comprehensive treatment strategy for femoroacetabular impingement was performed by Forster-Horvath et al. (2016). The study groups were divided into labral debridement/segmental resection (group 1) and labral reconstruction (group 2). Twelve studies explored outcomes after labral debridement/resection in a total of 400 hips and 7 studies reported on outcomes after labral reconstruction in a total of 275 hips. One additional matched-pair control study compared labral resection (22 hips) with reconstruction (11 hips). The surgical intervention was a revision in 0% to 100% for group 1 versus 5% to 55% for group 2. A direct anterior approach was not performed in group 2, and cam-type impingement appeared to make up a larger percentage of group 1. The Tönnis grade ranged from 0 to 1 for group 1 versus 0.3 to 1.1 for group 2. Joint replacements were performed in 0% to 30% and 0% to 25%, respectively. The modified Harris Hip Score suggested that labral reconstruction was not inferior to labral debridement/segmental resection. The authors concluded that clinical outcomes after labral debridement/segmental resection versus labral reconstruction were found to be comparable.

Zhang et al. (2016) conducted a meta-analysis to evaluate the efficacy and safety of hip arthroscopy versus open surgical dislocation for treating femoroacetabular impingement (FAI). Five controlled clinical trials evaluating a total of 352 hips were included. No randomized control trials were found. Compared with open surgical dislocation, hip arthroscopy resulted in significantly higher Nonarthritic Hip Scores (NAHS) at 3- and 12-month follow-ups, a significant improvement in NAHS from preoperation to 3 months postoperation, and a significantly lower reoperation rate. Open surgical dislocation resulted in a significantly improved alpha angle by the Dunn view in patients with cam osteoplasty from preoperation to postoperation, compared with hip arthroscopy. There were no significant differences in the modified Harris Hip Score, Hip Outcome Score-Activities of Daily Living, or Hip Outcome Score-Sport Specific Subscale at 12 months of follow-up, or in complications (including nerve damage, wound infection, and wound dehiscence). The authors concluded that this meta-analysis found that hip arthroscopy resulted in a significantly higher NAHS after 3 and 12 months of follow-up, and a significantly improved NAHS from preoperation to 3 months postoperation, than open surgical dislocation.

Nwachukwu, et al. (2015) performed a systematic review and meta-analysis to determine whether there was a significant difference in clinical outcomes and progression to total hip arthroscopy between hip arthroscopy and open surgical hip dislocation treatment for FAI at minimum medium-term follow-up (36 months). They concluded that both hip arthroscopy and open surgical hip dislocation showed excellent and equivalent hip survival rates at 36 months with hip-specific outcome measures, demonstrating equivalence between groups. However, hip arthroscopy was shown to have superior results regarding general health-related quality of life in comparison to open treatment. Further studies are needed through well-conducted clinical trials to assess long-term outcomes for patients with FAI and increase understanding of the natural history of FAI.

Larson et al. (2016) conducted a cohort study which 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 included labral repair (76%), labral debridement (23%), capsular repair/plication (82%), and femoral osteochondroplasty (72%). Pre- and postoperative function were evaluated prospectively with the modified Harris Hip Score (mHHS), 12-Item Short Form Health Survey, and visual analog scale for pain. The results of the dysplastic cohort were compared with a cohort of 231 hips without radiographic dysplasia that underwent arthroscopic Femoroacetabular Impingement (FAI) correction during the study period. At the time of final follow-up, the dysplastic cohort demonstrated 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 cohort. The dysplastic cohort had 60.9% good/excellent results and 32.2% failures, compared with 81.2% good/excellent results and 10.5% failures for the FAI cohort. Failure was defined as a mHHS ≤70 or eventual pelvic/femoral osteotomy or total hip arthroplasty. Dysplastic hips that underwent capsular plication and labral repair had greater good/excellent results (73%) and mean latest mHHS (85), as well as lower failure rates (18%) compared with the remainder of the dysplastic cohort. The authors concluded that arthroscopic management of mild to moderate acetabular dysplasia had inferior good/excellent results and higher failure rates when compared with an FAI.
cohort; therefore, isolated arthroscopic procedures in this population should be cautiously considered. Labral repair and capsular plication resulted in better clinical outcomes.

Collins, et al. (2015) conducted a systematic review of the literature to determine if prophylactic surgical intervention for asymptomatic patients with radiographic evidence of FAI is warranted to prevent early degenerative joint disease of the hip. Inclusion criteria were prospective or retrospective 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 met the eligibility criteria, they conclude that current evidence does not support prophylactic surgery for asymptomatic FAI in the vast majority of cases. However, they also identified that limited evidence suggests that asymptomatic patients who have previously undergone total hip arthroplasty for FAI-induced osteoarthritis of the contralateral hip are at a significantly increased risk for early degenerative joint disease. Further research is needed through well-conducted clinical trials to better clarify surgical indications for prophylactic surgical intervention of patients with asymptomatic FAI.

de Sa, et al. (2015) conducted a systematic review aimed to establish specific indications, outcomes, and complications of surgical management of adolescent FAI (patients aged 10-19 years of age). There were 6 eligible case series (4 with arthroscopic and 2 with open technique) and 2 conference abstracts examining 388 patients in total (435 hips), 81% of which were treated with hip arthroscopy. Overall, patients were followed up for a mean of 23.4 months postoperatively (range, 3 to 75 months). The main indication for surgery was a confirmed diagnosis of FAI with persistent pain and impaired function refractory to nonsurgical interventions (activity modification, intra-articular injections, etc.). The review concluded that both arthroscopic and open surgical dislocation approaches for the treatment of adolescent FAI appear to be safe and effective options for patients with persistent pain and limited function after an appropriate trial of nonoperative therapy.

Fukui et al. (2015) conducted a study of patients with dysplasia whose affected hip had a Wiberg center-edge angle of 20° to 25° and who underwent primary hip arthroscopy. One hundred two hips underwent hip arthroscopy with labral repair with correction of Femoroacetabular Impingement (FAI) and capsular closure. At a mean follow-up point of 40 months, the preoperative modified Harris Hip Score had improved from a mean of 63.5 points to a mean of 84.9 points. The mean score on the Western Ontario and McMaster Universities Arthritis Index improved from 25.3 to 9.7. The 12-Item Short Form Health Survey Physical Component Summary score also significantly improved (from 42.5 to 50.9), whereas the 12-Item Short Form Health Survey Mental Health Component Summary score showed an insignificant improvement (from 52.4 to 54.1). The authors concluded that this study showed that FAI and labral pathology can be successfully managed using hip arthroscopy, with capsular management, in patients with borderline dysplasia. Patients showed significant improvements in outcomes and high levels of satisfaction after hip arthroscopy.

Ayeni, et al. (2014) systematically reviewed the clinical literature to determine the identify outcomes addressing femoroacetabular impingement, especially those comparing labral debridement to labral repair. Six studies met the inclusion criteria. The authors concluded that the review demonstrates better reporting of clinical outcomes with labral repair compared to labral debridement in all studies. Five of six studies reported statistically significant improvements (of repair over debridement). However, given the lack of high quality evidence and associated limitations in study design, these results should be interpreted with caution. Definitive treatment recommendations require further investigation with well-conducted clinical trials.

Byrd and Jones (2011) found that most athletes treated with arthroscopic hip surgery were able to resume their activities. The authors reported on a case series of 200 patients identified who underwent arthroscopic management of femoroacetabular impingement, participated in athletic activities, and had achieved minimum 1-year follow up. The authors stated that there was 100% follow-up at an average of 19 months. A total of 116 athletes had achieved 2-year follow-up. The median preoperative score was 72 with a postoperative score of 96 and the median improvement was 20.5 points, which was statistically significant. The authors reported that 95% percent of professional athletes and 85% of intercollegiate athletes were able to return to their previous level of competition. There were 5 transient neurapraxies (all resolved) and 1 minor heterotopic ossification. One athlete (0.5%) underwent conversion to total hip arthroplasty and 4 (2%) underwent repeat arthroscopy. For the group with minimum 2-year follow up, the median improvement was 21 points with a postoperative score of 96.

Clohisy et al. (2010) completed a systematic review of 2834 studies of which 11 met the eligibility criteria and underwent comprehensive quality appraisal and review. Most studies were relatively small, single-surgeon cohorts. The review was completed to review (1) determine the level of clinical evidence regarding FAI surgery; (2) determine whether implantation surgery relieves pain and improves hip function; (3) identify complications associated with these procedures; and (4) identify modifiable causes of failure. The current evidence regarding FAI surgery is primarily Level IV (case series) with no Level I (systematic review/randomized controlled trials) or II (prospective cohort) studies identified. All studies documented short decreased pain and improved function in the majority (65 to 96%) of patients with short term follow-up. Many of the studies also propose that certain factors are associated with a subjectively defined fair or poor functional score and/or surgical failure. These poor prognostic factors, although
variously reported, include more advanced preoperative osteoarthritis, advanced articular cartilage disease, older age, and more severe preoperative pain. These observations highlight the negative impact of secondary osteoarthritis on the long-term results of surgical intervention. Therefore, joint preservation impingement surgery should be undertaken with caution in the presence of secondary osteoarthritis. The authors concluded that the literature suggests hip impingement surgery is associated with early relief of pain and improved function; however, the impact on long-term clinical results and natural history has not been established. Future studies must focus on an improved set of end points to study this patient population more precisely. Refined, standardized, and validated methods of documenting disease classification, measuring clinical outcomes, and reporting perioperative complications are needed to facilitate more sophisticated clinical investigation. Most importantly, future clinical trials are needed to determine the relative efficacy of nonsurgical and surgical treatment. Predictors of treatment outcome and the efficacy of various surgical techniques need to be established in well-designed clinical trials.

Ng et al. (2010) conducted a systematic review of 23 reports (970 cases) to review the efficacy of surgical treatment for femoroacetabular impingement and which patients will have best outcomes. Multiple different outcome scores were used, including the Western Ontario and McMaster Osteoarthritic Index (WOMAC), the Harris hip score (HHS), the modified HHS (which includes only the pain and function portion of the original HHS), the visual analog scale (VAS), the SF-12 Health Survey (SF-12), the non-arthritic hip score (NAHS), and the Merle d’Aubigne’ hip score. The reported outcome scores improved after treatment for femoroacetabular impingement in all studies, and the effect size was significant for improvement in patient outcomes. Despite these improvements, up to 30% of patients will eventually require total hip arthroplasty. Patients requiring revision to arthroplasty are those with Outerbridge grade III or IV cartilage damage seen intra-operatively or with preoperative radiographs showing greater than Tonnis grade I osteoarthritis. Mean improvement in pain ranged from 25.1% to 100%. Patients dissatisfied with the procedure or who had no improvement of their pain ranged from 0% to 31.2%. The authors concluded that surgical treatment for FAI reliably improves patient symptoms in the majority of patients without advanced osteoarthritis or chondral damage.

A prospective study by Philippon et al. (2009) reported 2 year outcomes of 112 patients who underwent arthroscopic surgery of the hip for femoroacetabular impingement. Mean age was 40.6 yrs. At arthroscopy, 23 patients underwent osteoplasty only for cam impingement, 3 underwent rim trimming only for pincer impingement, and 86 underwent both procedures for mixed-type impingement. Mean follow-up was 2.3 years. Mean modified Harris hip score (HHS) improved from 58 to 84 (mean difference = 24 and the median patient satisfaction was 9 (1 to 10). Continuous passive motion (CPM) was used at night although compliance with this was not recorded. Ten patients underwent total hip replacement at a mean of 16 months (8 to 26) after arthroscopy. Of the remaining 102 patients, 12 were lost to follow-up and two-year outcomes were thus obtained for 90 patients. Eight patients did not show any improvement in their modified HHS, with a mean pre-operative score of 66 and a mean post-operative score of 50. The authors concluded that hip arthroscopy for femoroacetabular impingement, accompanied by suitable rehabilitation, gives good short-term outcomes and high patient satisfaction; however, it is unclear how this procedure will affect the long-term outcome of the hip joint.

Matsuda et al. (2011) conducted a literature review to analyze the current approaches to the surgical management of symptomatic femoroacetabular impingement (FAI). Eighteen peer-reviewed treatment outcome studies met the inclusion criteria with minimum 1-year follow-up of the surgical treatment of skeletal pathoanatomy and associated chondralabral pathology in skeletally mature patients with FAI. There were 6 open surgical dislocation, 4 mini-open, and 8 arthroscopic studies. The authors found that open dislocation, mini-open, and arthroscopic methods for treating symptomatic FAI are effective in improving pain and function in short-term to midterm studies and are relatively safe procedures. The historical gold standard of open dislocation surgery had a comparatively high major complication rate primarily because of trochanteric osteotomy-related issues. The mini-open method showed comparable efficacy but a significant incidence of iatrogenic injury to the lateral femoral cutaneous nerve in some studies. The arthroscopic method had surgical outcomes equal to or better than the other methods with a lower rate of major complications when performed by experienced surgeons.

The 2016 Warwick Agreement on femoroacetabular impingement (FAI) syndrome was convened to build an international, multidisciplinary consensus statement on the diagnosis and management of patients with FAI syndrome. “FAI syndrome can be treated by conservative care, rehabilitation or surgery. Conservative care may involve education, watchful waiting, lifestyle and activity modification. Physiotherapy-led rehabilitation aims to improve hip stability, neuromuscular control, strength, range of motion and movement patterns. Surgery, either open or arthroscopic, aims to improve the hip morphology and repair damaged tissue. Physiotherapy-led rehabilitation aims to improve hip stability, neuromuscular control, strength, range of motion and movement patterns. Surgery, either open or arthroscopic, aims to improve the hip morphology and repair damaged tissue. The good management of the variety of patients with FAI syndrome requires the availability of all of these approaches.” Level of agreement: mean score 9.5 (95% CI 9.0 to 10). (Griffin et al. 2016)
The National Institute for Health and Care Excellence (NICE) 2011 guidance documents state that the current evidence on the safety and efficacy for arthroscopic and open femoroacetabular surgery for hip impingement syndrome is adequate in terms of symptom relief in the short and medium term (NICE, 2011).

**U.S. FOOD AND DRUG ADMINISTRATION (FDA)**

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Although arthroscopic hip surgery for FAI is a procedure that is not subject to FDA regulation, devices and instruments used during the surgery require FDA approval. A search of the FDA 510(k) database revealed over 500 arthroscopies approved for marketing (product code HRX); however, the available studies did not provide sufficient information to determine which 510(k) approvals correspond to the instruments used. Additional information is available at: [http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm](http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm). (Accessed August 23, 2019)

**CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)**

Medicare does not have a National Coverage Determination (NCD) for the surgical treatment of femoroacetabular impingement (FAI) syndrome. Local Coverage Determinations (LCDs) do not exist at this time. (Accessed September 20, 2019)

**REFERENCES**


