Surgical Treatment of Femoroacetabular Impingement

(701118)

Medical Benefit
Effective Date: 10/01/13
Next Review Date: 07/17

Preauthorization
No
Review Dates: 09/09, 09/10, 07/11, 07/12, 07/13, 07/14, 07/15, 07/16

Preauthorization is not required.

The following Protocol contains medical necessity criteria that apply for this service. The criteria are also applicable to services provided in the local Medicare Advantage operating area for those members, unless separate Medicare Advantage criteria are indicated. If the criteria are not met, reimbursement will be denied and the patient cannot be billed. Please note that payment for covered services is subject to eligibility and the limitations noted in the patient’s contract at the time the services are rendered.

Description

Femoroacetabular impingement (FAI) results from localized compression in the joint due to an anatomic mismatch between the head of the femur and the acetabulum. Symptoms of impingement typically occur in young to middle-aged adults before the onset of osteoarthritis (OA) but may be present in younger patients with developmental hip disorders. The objective of surgical treatment of FAI is to improve symptoms and reduce further damage to the joint.

Summary of Evidence

Five prospective/consecutive case series with more than 100 hips/patients treated for FAI have been identified. These studies show a 20-point improvement on the modified Harris Hip Score at short- to mid-term follow-up, indicating a change from marked pain with a serious limitation of activities preoperatively to mild pain after treatment, or from moderate pain with some limitations of ordinary activity or work to slight or no pain after treatment. Given that the arthroscopic procedure was developed around 2004, long-term follow-up is limited.

What can be ascertained from the current literature:

- Not all patients with FAI morphology will have FAI pathology.
- There is a high association between FAI pathology and idiopathic osteoarthritis (OA), but this may represent a small proportion of the total cases of hip OA.
- Patients may present with hip pain that can be diagnosed as FAI by a combination of clinical evaluation, radiographs, and magnetic resonance arthrography (MRA).
- In cases in which there is a positive impingement test result, anterosuperior labral, or acetabular damage identified on MRA and a pistol-grip morphology identified on imaging, there is a very high probability that the acetabular damage is caused by impingement of the femoral head-neck junction against the acetabular rim. FAI can be verified intraoperatively.
- Repair of the labrum alone can improve symptoms in the short term. It is reasonable to expect that debridement/osteoplasty of the bump or bone spur would reduce continued abrasion in the long term. Some studies, albeit of low quality, support this view.
Treatment of FAI is most effective in younger patients without OA (Tonnis grade 0 or I) or severe cartilage damage. Although OA can be identified with plain film radiographs, articular damage is not always identified with current imaging techniques.

There is a high probability that symptoms in patients with OA (Tonnis grade II or III, or joint space less than two mm) or severe cartilage damage (Outerbridge grade IV) will not improve following osteoplasty. These patients may require total hip arthroplasty (THA) for progressing pain within five years.

In large case series, arthroscopic treatment of FAI in young to middle-age patients without OA and showing mild-to-moderate cartilage damage results in 75% to 85% of patients improved.

Smaller case series suggest that open treatment of FAI in young to middle-age patients with moderate to severe cartilage damage results in 50% to 70% of patients improved. Nonunion has been reported to occur in 27% of patients following the transection of the great trochanter with hip dislocation.

What cannot be ascertained from the literature:

It is not known which patients with FAI morphology are most likely to progress to OA. The progression of pincer impingement with damage initially restricted to the labrum may follow a different time course than cam-type impingement.

It is not known whether treatment of FAI will reduce the occurrence of OA.

Based on the (1) intraoperatively established relationship between FAI morphology and damage to the acetabulum, (2) consistent improvement in symptoms reported in large prospective case series, and (3) the potential for continued and irreparable cartilage damage if FAI pathology is not addressed, it may be considered medically necessary to débride the bone at the same time that the labrum and/or articular cartilage is being repaired when specific criteria are met. This conclusion is supported by clinical input from physician specialty societies and academic medical centers. Because of the differing benefits and risks of open and arthroscopic approaches, patients should make an informed choice.

Although one longitudinal study found modest increased risk of OA in patients with cam-type FAI, additional evidence is needed to permit conclusions concerning the effect of this procedure on the development of OA. Therefore, treatment of FAI morphology in the absence of symptoms is considered investigational.

Due to the unclear balance of risks and benefits, questions regarding whether, when, and how to treat symptomatic FAI in children with slipped capital femoral epiphysis (SCFE) are difficult. Although the impact of not treating FAI is established, there is limited evidence on treatment outcomes in pediatric patients. The open dislocation procedure is technically demanding with a high risk of serious complications and has not been shown to be safe and effective outside of a few highly specialized centers. In addition, questions remain concerning selection criteria and the appropriate timing and approach for FAI treatment in patients with developmental hip disorders. In a 2009 review of SCFE, surgeons from Children’s Hospital Boston considered subcapital correction osteotomy with surgical dislocation to be an emerging treatment, stating that, “Currently, we recommend that this type of treatment should be restricted to few select specialized centers until the availability of long-term results and outcome. Also, this type of treatment has a steep learning curve, and it is advised to learn this surgical technique at a specialized center.” Because this approach has not been shown to be safe and effective outside of a few specialized centers, surgical treatment of FAI in pediatric patients is considered investigational.

**Policy**

Open or arthroscopic treatment of femoroacetabular impingement may be **medically necessary** when all of the following conditions have been met:
Age
• Candidates should be skeletally mature with documented closure of growth plates (e.g., 15 years or older).

Symptoms
• Moderate-to-severe hip pain that is worsened by flexion activities (e.g., squatting or prolonged sitting) that significantly limits activities; AND
• Unresponsive to conservative therapy for at least three months (including activity modifications, restriction of athletic pursuits and avoidance of symptomatic motion); AND
• Positive impingement sign on clinical examination (pain elicited with 90° of flexion and internal rotation and adduction of the femur).

Imaging
• Morphology indicative of cam or pincer-type FAI, e.g., pistol-grip deformity, femoral head-neck offset with an alpha angle greater than 50°, a positive wall sign, acetabular retroversion (overcoverage with crossover sign), coxa profunda or protrusion, or damage of the acetabular rim; AND
• High probability of a causal association between the FAI morphology and damage, e.g., a pistol-grip deformity with a tear of the acetabular labrum and articular cartilage damage in the anterosuperior quadrant; AND
• No evidence of advanced osteoarthritis, defined as Tonnis grade II or III, or joint space of less than 2 mm; AND
• No evidence of severe (Outerbridge grade IV) chondral damage.

Treatment of FAI is considered **investigational** in all other situations.

Policy Guidelines
If FAI morphology is identified, patients should be advised not to play aggressive sports. In addition to magnetic resonance arthrography (MRA), some clinicians may also use local anesthetic injection into the joint to assist in confirming FAI pathology.

Treatment of FAI should be restricted to centers experienced in treating this condition and staffed by surgeons adequately trained in techniques addressing FAI. Because of the differing benefits and risks of open and arthroscopic approaches, patients should make an informed choice between the procedures.

Some patients may require a second procedure if they have persistent or recurrent symptoms and meet the criteria for treatment of FAI. Published studies indicate that not all sources of impingement may have been identified before surgery, and those that had been identified may not have been adequately treated. The risk of needing an additional surgical procedure can be reduced by intraoperative assessment of impingement after bone debridement and reshaping.

Background
FAI arises from an anatomic mismatch between the head of the femur and the acetabulum, causing compression of the labrum or articular cartilage during flexion. The mismatch can arise from subtle morphologic alterations in the anatomy or orientation of the ball-and-socket components (e.g., a bony prominence at the head-neck junction or acetabular overcoverage) with articular cartilage damage initially occurring from abutment of the femoral neck against the acetabular rim, typically at the anterosuperior aspect of the acetabulum. Although
hip joints can possess the morphologic features of FAI without symptoms, FAI may become pathologic with repetitive movement and/or increased force on the hip joint. High-demand activities may also result in pathologic impingement in hips with normal morphology.

Two types of impingement, known as cam impingement and pincer impingement, may occur alone or, more frequently, together. Cam impingement is associated with an asymmetric or nonspherical contour of the head or neck of the femur jamming against the acetabulum, resulting in cartilage damage and delamination (detachment from the subchondral bone). Deformity of the head/neck junction that looks like a pistol grip on radiographs is associated with damage to the anterosuperior area of the acetabulum. Symptomatic cam impingement is found most frequently in young male athletes. Pincer impingement is associated with overcoverage of the acetabulum and pinching of the labrum, with pain more typically beginning in women of middle age. In cases of isolated pincer impingement, the damage may be limited to a narrow strip of the acetabular cartilage. It has been proposed that impingement with damage to the labrum and/or acetabulum is a causative factor in the development of hip OA and that as many as half of cases currently categorized as primary OA may have an etiology of FAI.

Previously, access to the joint space was limited, and treatment primarily consisted of débridement and/or labral reattachment. A technique for hip dislocation with open osteochondroplasty that preserved the femoral blood supply was reported by Ganz et al in 2001. Visualization of the entire joint with this procedure led to the identification and acceptance of FAI as an etiology of cartilage damage (the association between abnormal femoral head/neck morphology and early age onset of OA had been described earlier by others) and the possibility of correcting the abnormal femoroacetabular morphology. Open osteochondroplasty of bony abnormalities and treatment of the symptomatic cartilage defect is considered the criterion standard for complex bony abnormalities. However, open osteochondroplasty is invasive, requiring transection of the greater trochanter (separation of the femoral head from the femoral shaft) and dislocation of the hip joint to provide full access to the femoral head and acetabulum. In addition to the general adverse effects of open surgical procedures, open osteochondroplasty with dislocation has been associated with nonunion and neurologic and soft tissue lesions. Less invasive hip arthroscopy and an arthroscopy-assisted mini-approach were adapted from the open approach by 2004. Arthroscopy requires specially designed instruments and is considered to be more technically difficult due to reduced visibility and limited access to the joint space. Advanced imaging techniques, including computed tomography and fluoroscopy, have been used to improve visualization of the three-dimensional head/neck morphology during arthroscopy.

An association between FAI and athletic pubalgia, sometimes called sports hernia, has been proposed. Athletic pubalgia is an umbrella term for a large variety of musculoskeletal injuries involving attachments and/or soft tissue support structures of the pubis. It is believed that if FAI presents with limitations in hip range of motion, compensatory patterns during athletic activity may lead to increased stresses involving the abdominal obliques, distal rectus abdominis, pubic symphysis, and adductor musculature. The condition is more common in men than in women and is associated with sports in which high speed twisting of the hip and pelvis occur (e.g., football, hockey). Under surgical exploration, a variety of musculotendinous defects, nerve entrapments, and inflammatory conditions have been observed.

The recognition and treatment of FAI has also brought attention to the possibility of cam-type FAI after SCFE. The standard treatment for SCFE is stabilization across the physis by in situ pinning, although it is not uncommon for patients with SCFE to develop premature OA requiring THA within 20 years. Treatments being evaluated for pediatric patients with SCFE-related FAI include osteoplasty without dislocation, or with the open dislocation technique described by Ganz. The Ganz technique (capital realignment with open dislocation) is technically demanding with a steep learning curve and a high risk of complications. Therefore, early treatment to decrease impingement must be weighed against increased risk for adverse events including avascular necrosis in patients with SCFE.
It is known that surgical treatment of FAI pathology is less effective for pain reduction in patients with late stage OA. In addition, delay in the surgical correction of bony abnormalities may lead to disease progression to the point at which joint preservation is no longer appropriate. It is believed that osteoplasty of the impinging bone is needed to protect the cartilage from further damage and to preserve the natural joint. Therefore, if FAI morphology is shown to be an etiology of OA, a future strategy to reduce the occurrence of idiopathic hip OA could be early recognition and treatment of FAI before cartilage damage occurs.

Regulatory Status

Surgery for treatment of femoroacetabular impingement is a surgical procedure and as such, is not subject to regulation by the U.S. Food and Drug Administration.

Related Protocol

Hip Resurfacing

Services that are the subject of a clinical trial do not meet our Technology Assessment Protocol criteria and are considered investigational. For explanation of experimental and investigational, please refer to the Technology Assessment Protocol.

It is expected that only appropriate and medically necessary services will be rendered. We reserve the right to conduct prepayment and postpayment reviews to assess the medical appropriateness of the above-referenced procedures. Some of this Protocol may not pertain to the patients you provide care to, as it may relate to products that are not available in your geographic area.

References

We are not responsible for the continuing viability of web site addresses that may be listed in any references below.


