

Femoroacetabular Impingement Treatment Guidelines

Femoroacetabular impingement (FAI) is a condition characterized by abnormal contact between the femoral head and the acetabular rim, causing joint damage, pain, and restricted motion. FAI is a leading cause of early osteoarthritis and is classified into three types: cam, pincer, and combined morphologies.

Type of impingement	Pathophysiology	Primary location	Key imaging findings
Cam impingement	<p>Extra bone growth at the femoral head-neck junction reduces the smooth contour, leading to increased shearing forces on the acetabular cartilage.</p> <p>This can result in cartilage delamination and labral detachment.</p>	Anterosuperior portion of the femoral head	Loss of the femoral head's round shape; classic "pistol grip deformity."
Pincer impingement	<p>Over-coverage of the femoral head by the acetabular rim compresses the labrum between the acetabular rim and the femoral neck.</p> <p>This repeated compression leads to labral tearing and degeneration.</p>	Anterosuperior acetabular rim	Crossover sign, protrusio acetabuli, or acetabular retroversion indicating over-coverage.
Combined impingement	<p>Both an irregularly shaped femoral head and an overhanging acetabular rim contribute to joint dysfunction.</p> <p>This combination increases the risk of labral tears, cartilage damage, and early osteoarthritis.</p>	Both the femoral head and acetabular rim	Features of both cam (e.g., alpha angle $>50^\circ$) and pincer (e.g., crossover sign, over-coverage).

Current treatment approaches

Non-operative management

Conservative management serves as the first-line treatment, particularly for asymptomatic or mildly symptomatic patients. Emphasis is placed on lifestyle modifications and physical therapy:

- **Activity modification:** Avoid activities that exacerbate symptoms by keeping movements within a safe range of motion. This approach can delay or reduce the need for surgical interventions.
- **Physical therapy:** Focus on strengthening the core and hip stabilizers, addressing compensatory patterns caused by chronic impingement, and improving hip flexibility. Avoid high-impact activities that increase impingement.
- **Medication:** Anti-inflammatory drugs can provide symptomatic relief but do not alter the underlying morphology.

Evidence supports the effectiveness of conservative management in improving symptoms for many patients. Emara et al. (2011) demonstrated that lifestyle and activity adaptations could yield significant short-term improvements in patients with mild FAI.

However, conservative approaches may not suffice for individuals with severe symptoms or those whose physical demands require optimal joint function. In such cases, surgical intervention becomes necessary.

Operative management

Surgical intervention is considered when conservative measures fail to provide adequate relief after six months or when imaging studies reveal significant osseous deformities that correlate with clinical findings.

The primary goal of surgery is to restore normal hip mechanics by addressing underlying bone abnormalities and repairing associated soft tissue damage. Patients with persistent symptoms, functional impairment, and positive physical examination findings, such as a positive Flexion, Adduction, Internal Rotation (FADIR) test, and the Flexion, Abduction, External Rotation (FABER) test are prime candidates for surgery.

However, contraindications such as joint space narrowing (<2 mm) or significant osteoarthritis may preclude surgical treatment.

Surgical techniques

Hip arthroscopy

Hip arthroscopy is the most widely performed surgical procedure for FAI and is considered minimally invasive. This technique allows surgeons to address labral and chondral lesions within the central compartment and reshape cam deformities in the peripheral compartment. Its effectiveness has been well-documented; Griffin et al. (2018) demonstrated superior outcomes in patients undergoing arthroscopy compared to those receiving conservative care, with significant improvements in functional scores and symptom relief.

Byrd and Jones also reported an average 20-point increase in Harris Hip Scores following arthroscopy (2011). Despite its benefits, complications such as neuropraxia, heterotopic ossification, and labral re-injury may occur, particularly when surgical times are prolonged.

Open surgical hip dislocation

Open surgical hip dislocation, historically the gold standard, offers 360° visualization of the hip joint, making it ideal for addressing complex deformities.

This approach allows precise correction of femoral head and acetabular abnormalities but involves more extensive soft tissue dissection, increased blood loss, and longer recovery times compared to arthroscopy (Fortier et al., 2022).

While medium-term survival rates are comparable to arthroscopic techniques, open dislocation is now less commonly performed due to its invasiveness.

Combined mini-open arthroscopy

The combined mini-open and arthroscopic approach integrates arthroscopic management of intra-articular lesions with mini-open correction of cam deformities.

This hybrid method avoids the need for a trochanteric osteotomy, reducing the risk of complications such as nonunion or hardware-related pain.

Studies, including those by Laude et al., have shown significant improvements in hip function, with patient-reported outcomes demonstrating increases in the Non-Arthritic Hip Score by over 29 points.

Capsular management

Capsular management is an essential component of surgical care. Proper closure or repair of the hip capsule enhances joint stability and reduces the risk of revision surgeries.

Research has consistently shown better outcomes with complete capsular closure compared to partial or incomplete repair (Maupin et al., 2019).

Post-surgical rehabilitation

Rehabilitation following surgery is a critical phase of treatment, designed to restore function and prevent the recurrence of symptoms.

In the initial phase of recovery, patients are instructed to limit weight-bearing activities to protect the surgical site while gradually reintroducing range-of-motion exercises.

Pain management strategies, including NSAIDs and physical modalities, are employed to ensure patient comfort during this stage.

As recovery progresses, strengthening exercises targeting the hip stabilizers are introduced to improve joint support.

Functional training tailored to the patient's activity demands is implemented during the advanced phase of rehabilitation, facilitating a return to daily activities and sports.

Return-to-play timelines typically range from three to seven months, depending on the severity of the condition and the individual's recovery trajectory.

Summary of treatments

Treatment type	Details	Advantages	Disadvantages
Non-operative management	Physical therapy Activity modification Use of anti-inflammatory medications	Avoids surgical risks Short-term symptom improvement for mild cases	Does not correct underlying morphological issues Limited long-term efficacy
Open surgical dislocation	Provides 360° visualization Allows for comprehensive correction of FAI morphology Utilizes a trochanteric osteotomy	The gold standard for full access to the hip joint Effective for complex deformities	Larger surgery with significant soft tissue dissection Longer recovery time Risks of nonunion and hardware complications
Mini-open arthroscopic assisted	Combines arthroscopy for intra-articular pathology with a small open approach for bony lesions	Avoids trochanteric osteotomy Improves hip scores postoperatively	Higher complication and revision rates compared to arthroscopy
Arthroscopy	Minimally invasive Addresses articular and labral issues through central and peripheral compartments	Shorter recovery time Lower complication rates than open procedures Effective for treating most FAI pathologies	May require revision if bony resection is inadequate Limited visualization compared to open surgery

Additional notes

References

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