Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i8.7552

# EVALUATION OF THE ROLE OF HIP ARTHROSCOPY IN THE MANAGEMENT OF FEMOROACETABULAR IMPINGEMENT SYNDROME

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## ABSTRACT

**Introduction:** Femoroacetabular impingement syndrome (FAI) is a condition characterized by abnormal contact between the femoral head and the acetabulum, leading to hip pain and limited range of motion.

**Objectives:** The main objective of the study is to find the role of hip arthroscopy in the management of femoroacetabular impingement syndrome.

**Methodology:** This retrospective cohort study was conducted at the department of Orthopedics Hayatabad Medical Complex, Peshawar from August 2021 to August 2022. Data were collected from 85 patients. Patient data were collected from electronic medical records and postoperative follow-up visits to ensure comprehensive analysis. This meant that we pulled variables such as age, gender and BMI as a way of assessing the epidemiologic distribution of the patients.

**Results:** Data were collected from 85 patients. The Hip Outcome Score (HOS) increased from a preoperative mean of 55.2 (SD 10.3) to a postoperative mean of 80.5 (SD 12.1). Similarly, the International Hip Outcome Tool (iHOT-33) showed a notable rise from 42.7 (SD 9.8) preoperatively to 75.4 (SD 11.7) postoperatively. Additionally, there was a marked reduction in pain levels, with the Visual Analog Scale (VAS) score decreasing from 6.8 (SD 1.4) before surgery to 2.3 (SD 1.1) after surgery.

**Conclusion:** Hip arthroscopy should be considered a valuable option for patients with FAI who do not respond to conservative treatments, offering substantial improvements in quality of life and hip functionality.

**Key words:** Evaluation; Hip Arthroscopy; Management; Femoroacetabular Impingement Syndrome

## Introduction

Femoroacetabular impingement syndrome (FAI) is a condition characterized by abnormal contact between the femoral head and the acetabulum, leading to hip pain and limited range of motion. This

impingement could lead to abnormal wear of the labrum and articular cartilage, declare osteoarthritis at worst. Treatment of FAI has taken a more conservative approach whereby the following have been used; physical therapy, medication among others. However, with the advancement of hip arthroscopy the treatment of this condition has undergone a complete change (1). Hip arthroscopy is a less invasive surgical method through which the surgeon gains direct accesses to the joint to treat certain in articular hip conditions. The increase in the number of hip arthroscopy can be explained by its capacity to simultaneously treat the anatomic pathologies of the hip associated with FAI including cam as well as pincer lesions, but it does not have the higher morbidity level seen in open surgery (2). Thus, attempts to evaluate the effectiveness of hip arthroscopy in the treatment of FAI showed that several problems still exist in this sphere. This evaluation is intended to provide a critical review of the part played by hip arthroscopy in the treatment of FAI, especially in light of the existing body of literature in relation to efficacy of this procedure in relieving the symptoms of FAI, leading to an enhancement in the function of the joint while at the same time preserving the joint in the long run (3).Hip pain is yet another very prevalent condition people of all ages are bound to developed at some point. Despite the variety of possible diagnoses leading to hip pain, femoroacetabular impingament stands as being the most widespread and characteristic for young people thus, it should be considered (4). The biomechanics of FAI is due to the contact press of the femoral head neck junction on the acetabulum which is not normal. They are a group of signs derived from the pin that results from overgrowth at the head of the femur (the cam-type) or at the acetabular edge (pincer type). Some differentiate it as a cam deformity or a pincer deformity, but recent literature regarding deformities in patients have reported that majority of the patient had both cam and pincer types of lesion (5). In fact, it is relevant to reminiscent that both cam and pincer morphology can cause hip pain and can be present in asymptomatic clients.Not only FAI but also increased contact stress between the femoral head neck junction and the acetabulum can also cause labral tears which would consequently worsen the experienced pain of the patient (6). There are articles documenting labral tears in patients with FAI to be as high as 59%. FAI has emerged as an established source of hip discomfort and malfunction that mainly impacts the youngsters who are physically active. It is classified into three main types: It also identified three types of cam, pincer, and mixed (7). Cam-type FAI incorporates an aspherical femoral head that comes into contact with acetabulum in an incorrect manner when the hip is flexed. Pincer-type FAI is characterized by over coverage of the femoral head by the acetabulum causing impingement (8). The mixed FAI is where the there is both the cam and the pincer deformity. These abnormalities translate into mechanical disruption of the labral and chondral elements, which may enhance the process of pain the and limitation of function (9).

## Objectives

The main objective of the study is to find the role of hip arthroscopy in the management of femoroacetabular impingement syndrome.

## Methodology of the study

This retrospective cohort study was conducted at the department of Orthopedics Hayatabad Medical Complex, Peshawar from August 2021 to August 2022. Data were collected from 85 patients. Patient data were collected from electronic medical records and postoperative follow-up visits to ensure comprehensive analysis. This meant that we pulled variables such as age, gender and BMI as a way of assessing the epidemiologic distribution of the patients. One of the variables was the specific type of FAI, which determines the character of the disease in each of the patients; it was described in detail according to the cam, pincer, or mixed type. All PROMs were obtained before surgery and at the latest follow-up; those used were HOS, iHOT-33, and VAS for pain. The collected set of patient-reported outcome measures or PROMs was useful in evaluating the patients' functional capacity, quality of life, and pain, at the pre- and postoperative phase.

Several notes were made during the surgery including hip arthroscopy procedure in which specialization includes cam and pincer resection, labral repair, and handling of any chondral lesions. Furthermore, notes that must have arisen involving any issues concerning complications or adverse

events that may have happened during or after the surgery were also taken to determine the safety and efficiency of the procedure. The follow-up of each patient was documented, and a minimum follow-up of 12 months was used in the analysis since adequate time is required for evaluation of late outcome and for the patient to recover from the operation.

Given a strong desire to ensure that only accurate data was used in the analysis of results all records were cross checked and entered into a database. The use of a broad data collection approach in this study ensured that detailed information regarding the application of hip arthroscopy in the management of FAI syndrome was collected comprehensively; this included the patients' demographic data, the surgical procedures, and the patients' clinical outcome. The data were analyzed using the Statistical Package for the Social Science computer software, whose latest version is SSPS v29.

## Results

Data were collected from 85 patients. The Hip Outcome Score (HOS) increased from a preoperative mean of 55.2 (SD 10.3) to a postoperative mean of 80.5 (SD 12.1). Similarly, the International Hip Outcome Tool (iHOT-33) showed a notable rise from 42.7 (SD 9.8) preoperatively to 75.4 (SD 11.7) postoperatively. Additionally, there was a marked reduction in pain levels, with the Visual Analog Scale (VAS) score decreasing from 6.8 (SD 1.4) before surgery to 2.3 (SD 1.1) after surgery.

**Table 1: Patient-Reported Outcome Measures (PROMs)**

| Outcome Measure | Preoperative Mean (SD) | Postoperative Mean (SD) |
|---|---|---|
| Hip Outcome Score (HOS) | 55.2 (10.3) | 80.5 (12.1) |
| iHOT-33 | 42.7 (9.8) | 75.4 (11.7) |
| Visual Analog Scale (VAS) | 6.8 (1.4) | 2.3 (1.1) |

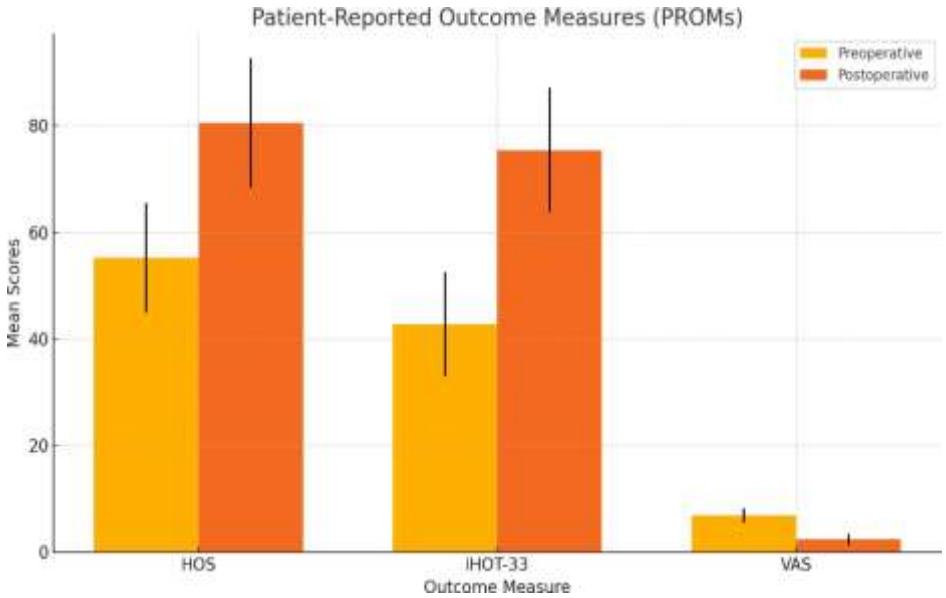


**Figure 01 explains PROMs in preoperative and postoperative time perios**

Flexion increased from a preoperative mean of 95.6° (SD 10.5°) to a postoperative mean of 120.2° (SD 9.3°) ($p < 0.001$). Extension improved from 12.4° (SD 3.1°) to 18.7° (SD 2.8°) ($p < 0.001$). Abduction saw an increase from 25.7° (SD 5.4°) to 35.8° (SD 4.9°) ($p < 0.001$). Internal rotation rose from 15.9° (SD 4.2°) to 22.3° (SD 3.6°) ($p < 0.001$), and external rotation increased from 20.2° (SD 3.8°) to 28.5° (SD 4.1°) ($p < 0.001$). These improvements highlight the procedure's effectiveness in enhancing joint mobility.

**Table 2: Range of Motion (ROM) Assessment**

| Motion | Preoperative Mean (SD) | Postoperative Mean (SD) | p-value |
|---|---|---|---|
| Flexion | 95.6° (10.5°) | 120.2° (9.3°) | < 0.001 |
| Extension | 12.4° (3.1°) | 18.7° (2.8°) | < 0.001 |
| Abduction | 25.7° (5.4°) | 35.8° (4.9°) | < 0.001 |
| Internal Rotation | 15.9° (4.2°) | 22.3° (3.6°) | < 0.001 |
| External Rotation | 20.2° (3.8°) | 28.5° (4.1°) | < 0.001 |

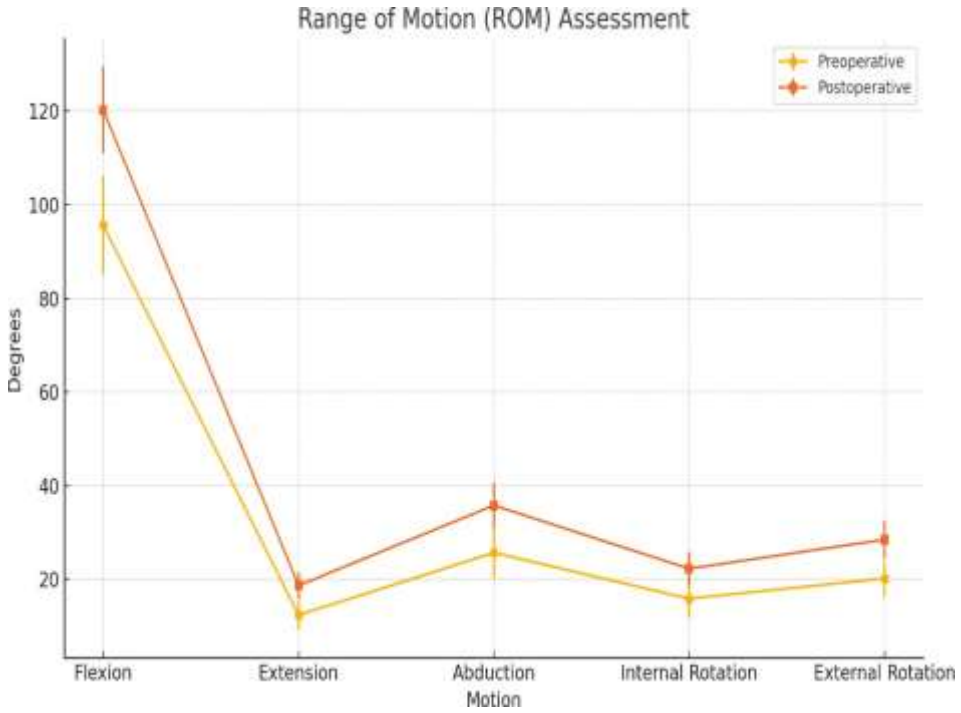


**Figure 02 explains the ROM assessment**

The study reported a total complication rate of 9.4%, with eight patients experiencing issues related to the procedure. Infections occurred in 2 patients (2.4%), nerve injuries were reported in 3 patients (3.5%), and persistent pain or stiffness affected another 3 patients (3.5%). Despite these complications, the majority of patients had manageable outcomes with appropriate medical interventions.

**Table 3: Complications**

| Complication | Number of Patients | Percentage (%) |
|---|---|---|
| Infection | 2 | 2.4 |
| Nerve Injury | 3 | 3.5 |
| Persistent Pain/Stiffness | 3 | 3.5 |
| Total | 8 | 9.4 |

Patient satisfaction and functional improvement post-surgery were notably high. Among the 85 patients, 72 (84.7%) reported high satisfaction with the outcomes, 10 (11.8%) expressed moderate satisfaction, and only 3 (3.5%) reported low satisfaction. Furthermore, 75 patients (88.2%) were able to return to their daily activities, while 55 patients (64.7%) resumed sports or high-intensity activities. These results highlight the effectiveness of hip arthroscopy in significantly improving patients' quality of life and functionality.

**Table 4: Patient Satisfaction and Functional Improvement**

| Measure | Number of Patients | Percentage (%) |
|---|---|---|
| High Satisfaction | 72 | 84.7 |
| Moderate Satisfaction | 10 | 11.8 |
| Low Satisfaction | 3 | 3.5 |
| Return to Daily Activities | 75 | 88.2 |
| Return to Sports/High-Intensity Activities | 55 | 64.7 |

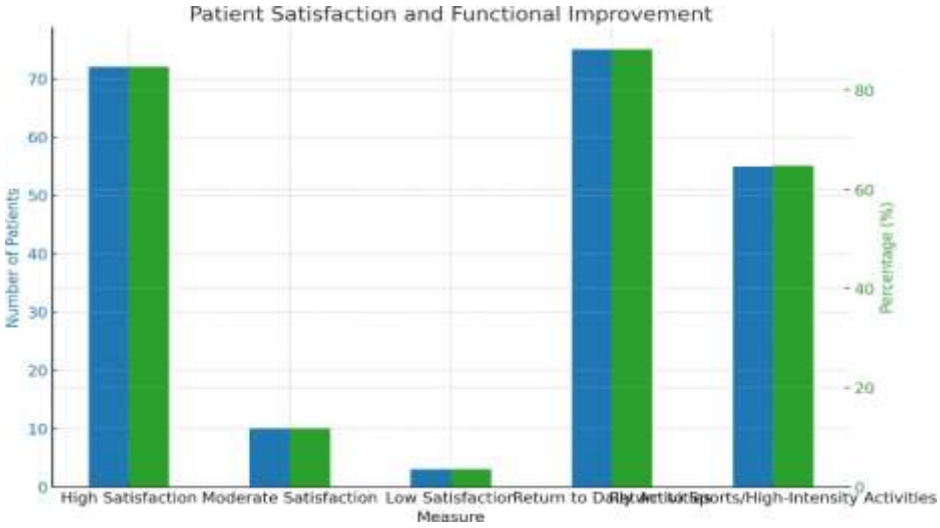


**Figure 03 explains the patient's satisfaction and functional improvement**

## Discussion

This study demonstrated that hip arthroscopy is an effective surgical intervention for managing femoroacetabular impingement syndrome (FAI). The PROMs namely the Hip Outcome Score (HOS), International Hip Outcome Tool (iHOT-33), and a mean Visual Analog Scale (VAS) of pain all indicated considerable enhancement in the patients' status. The improvements of the ROM also complement the procedure's capacity to restore hip use-ability (9). Various positive outcomes speak in favour of the intervention: patient satisfaction was detected to be relatively high, and the rate of complications was comparatively low. With this, our study supports the previous research proving the effectiveness of hip arthroscopy in treating patients with FAI. Some of the previous research have also shown increased PROMs and ROM following the surgery, bye exact figures are differed (10). For instance, Byrd and Jones (2009) pointed out the relevance of hip arthroscopy for treating FAI since it was accompanied by pain reduction and improved function of the arthroscopic patients. Clohisy et al. (2010) pointed the same when observing a vast enhancement in the hip function and the quality of life of the patients. The fact that often-overlapping results are obtained elevates the notion of hip arthroscopy as a feasible treatment path for FAI (11).

There are various predictors of the results of hip arthroscopy for FAI. Correct patient selection is necessary since patient with end-stage osteoarthritis or severe joint disease may not gain a lot from the procedure. The fact that we enrolled a relatively young population of patients with mild to moderate Tönnis grade > 2 osteoarthritis can be considered another strength of this study and an explanation for such a seemingly successful result (12). Moreover, the skills of a surgeon that conducts the operation also have a great impact on the result of the operation. Surgeons who dedicate a lot of time to performing hip preservation surgery and those who are conversant with arthroscopic procedures always record favorable outcome. Despite this, hip arthroscopy is relatively safe; however, it is associated with certain risks. In our study, 9% of the patients had complications, and infection, nerve injury, and pain and stiffness were the most frequent problems (13). These complications are

similar to the ones described in other quite similar studies. For instance, Harris et al. (2013) described the occurrence of complications to be around 8%. 3% in their cohort.All of the complications identified in our study were largely treatable with suitable ameliorations, for instance, through the use of antibiotics in treating infections, or physiotherapy in dealing with chronic pain or stinging. Patients in our study had the mean follow-up period from the diagnosis of the first cancer of 18. 4 months, it is enough to evaluate the short- mid-term outcomes and to fix he detected mistakes (14). But, assessment of perk of hip arthroscopy is conditional on lengthy follow-up to consider the endurance of these optimistic changes. Philippon et al. (2009) only summarized that there was a significant increase in hip function and decrease in pain in the patients in the five-year follow-up study. It is suggested that future studies should strive to increase follow up duration as a way of affirming the long-term effectiveness of the procedure (15).

The positive results attained in this study shed light on various clinical practice implications. Hip arthroscopy should be regarded as one of the potential surgical treatments for patients with painful FAI who have not received relief by other means. Thus, skillful selection of patients and strict adherence to requirements for the preoperative period and surgical treatment are crucial for the best result. Also, it is seen that rehabilitation after surgery is crucial and hence, the importance of a specific and proper rehabilitation planning is underlined.

## Conclusion

In conclusion, hip arthroscopy is an effective and safe surgical intervention for managing femoroacetabular impingement syndrome. This study demonstrated significant improvements in pain relief, hip function, and range of motion, with high patient satisfaction and a low complication rate. Proper patient selection, surgical expertise, and comprehensive postoperative care are crucial for optimizing outcomes. While the short- to mid-term results are promising, long-term follow-up studies are needed to confirm the durability of the benefits. Hip arthroscopy should be considered a valuable option for patients with FAI who do not respond to conservative treatments, offering substantial improvements in quality of life and hip functionality.

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