



Refixation of Labrum in Pincer Type of Femoroacetabular Impingement

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We present the case of a single, retired, 51-year-old Taiwanese female who had left groin pain when squatting, sitting, and walking for months. She visited our outpatient department (OPD) for further evaluation. During physical examination at the OPD, limited hip flexion and abduction were observed in comparison with the contralateral hip in the supine position. Impingement tests including flexion, abduction, and external rotation test and flexion, adduction, and internal rotation test were positive. In addition, the extension external pain and Patrick test results were positive. Pelvis radiography revealed a crossover sign and lateral center-edge angle of 40.6°. Magnetic resonance imaging revealed a degenerative tear of the anterosuperior labrum with a prominent pincer lesion. Consequently, she was admitted for arthroscopy-assisted rim resection of the pincer-type lesion and labral refixation. After surgery, the patient recovered well.

Key words: Labrum refixation, pincer type of femoroacetabular impingement, acetabuloplasty

INTRODUCTION

The labrum is a horseshoe-shaped soft-tissue structure, with a transverse ligament in its inferior portion. This fibrocartilaginous tissue is covered by the bony edge of the acetabulum, serving as an extension of the acetabular wall to the femoral head.¹ It functions as a suction seal and enlarges the total volume of the acetabulum. The seal creates negative pressure due to distraction and prevents hip dislocation. Furthermore, this mechanism contributes to hip joint lubrication and prevents direct contact with cartilage.¹

Femoroacetabular impingement (FAI) – caused by an abnormal bump of the femoral head and neck against the acetabulum – results in an abnormal repetitive contact between the acetabular rim and the femoral head-and-neck junction.² There are three types of FAI: pincer type, cam type, and mixed type. FAI can occur with other intraarticular pathology and be a precursor to osteoarthritis.³⁻⁵ The overall incidence of FAI is 54.4 per 100,000 person-years.⁶

Labral debridement and labral repair are surgical options to restore normal hip mechanics and treat existing damage. We performed arthroscopic acetabuloplasty combined with labral refixation.

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CASE REPORT

The ethics committee of the Tri-Service General Hospital approved this case report. (TSGHIRB No: B202105161). The patient was a single, retired, 51-year-old Taiwanese woman who visited the outpatient department for the evaluation of left groin pain when squatting, sitting, and walking for months. Upon physical examination, the patient had limited range of motion (ROM) of the left hip: flexion, 110°; abduction, 50°; adduction, 20°; internal rotation, 40°; and external rotation, 65°. The impingement tests flexion, abduction, external rotation (FABER) and flexion, adduction, internal rotation (FADIR) and Patrick test were positive. Pelvis radiography showed a crossover sign and lateral center-edge angle of 40.6° [Figures 1 and 2]. Nonsteroidal anti-inflammatory drugs were prescribed for pain relief, and magnetic resonance imaging (MRI) was performed, which revealed a degenerative tear of the anterosuperior labrum with a prominent pincer lesion [Figure 3].

The patient was admitted for surgery. She was placed in the supine position on a fracture table with

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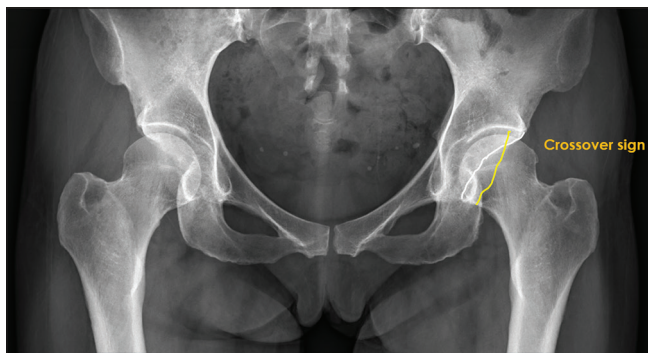


Figure 1: Crossover sign, also named figure of eight sign, indicates acetabular retroversion

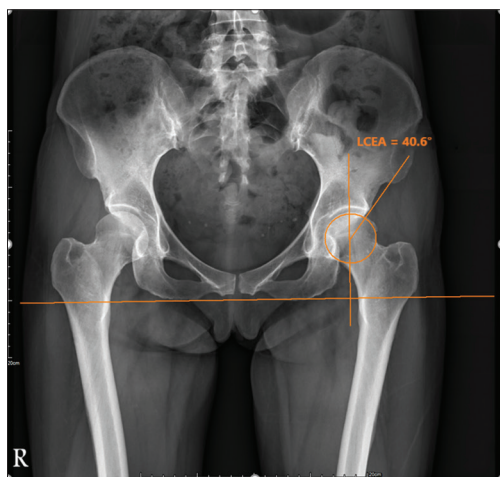


Figure 2: Lateral center-edge angle (LCEA) is a radiographic measurement of femoral head bony coverage by the acetabulum. LCEA = 40.6° (normal value under 40°)

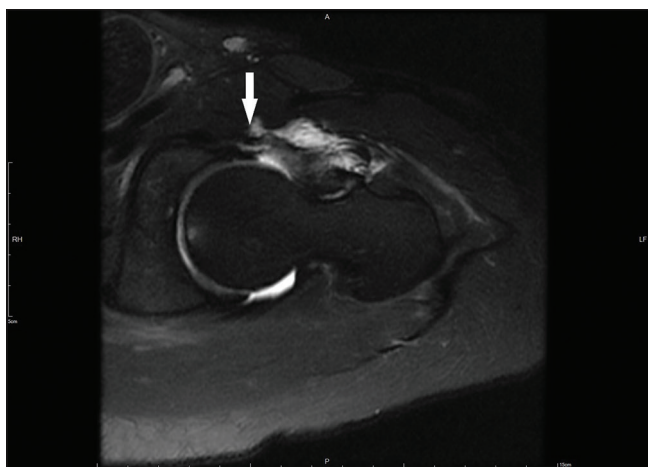


Figure 3: Degenerative tear of anterosuperior labrum with prominent pincer lesion (white arrow)

a Smith-Nephew SPIDER2 limb positioner. Next, the anterolateral portal followed by the midanterior portal was

established under the C-arm intensifier. Labral lesion and associated pathology were evaluated through capsulotomy and diagnostic arthroscopy [Figure 4a]. The labrum was torn at the anterosuperior region of the acetabulum. The acetabular rim was assessed preoperatively and intraoperatively, and the width of the rim resection was planned. A high-speed bur (Arthrex, 5.5-mm) was used to trim the acetabular rim and prepare the bone bed for labral refixation [Figure 4b]; unstable bony fragments were removed. After acetabuloplasty, labral refixation was performed using a NanoTack Flex Anatomic Labrum Restoration System (Stryker). A 25° flex guide was used to determine the pilot holes and direct visualization to ensure that the joint was not penetrated [Figure 4c]. One suture limb was passed into the joint between the labrum and the rim. A BirdBeak (Arthrex) passed through the torn labrum, retrieved the suture, and tied it with the knots on the capsular side [Figure 4d]. Three 1.4-mm ICONIX suture anchors (Stryker) were used for labral refixation. The traction was relieved from the leg, and the hip ROM was checked to ensure no residual impingement.

The rehabilitation regimen involved protected weight-bearing and continuous passive motion therapy for 4 weeks and early proprioceptive training. The patient resumed competitive sports after 6 months. At 1-year follow-up, the groin pain had improved, and the patient was recommended to participate in a rehabilitation program. FABER and FADIR tests, extension external pain, and Patrick test results were negative, and no limited left hip ROM was observed. The Harris hip score improved from 78.0 (preoperatively) to 92.0 (postoperatively). In addition, MRI revealed improved acetabular coverage [Figure 5].

DISCUSSION

Surgical management of FAI focuses on labral debridement or labral repair/refixation, trimming of acetabular over coverage, and reshaping the cam lesion of the proximal femur. This treatment has been traditionally performed through trochanteric osteotomy and open hip dislocation.^{3-5,7} Recently, Xie Z *et al.*⁷ reported the midterm (mean, 39.5 months) effectiveness of a surgical hip dislocation for FAI. There were significant differences in the visual analog scale and Harris scores, between pre-and post-operation and between 3 months postoperation and the last follow-up ($P < 0.05$). Surgical hip dislocation is still considered a safe and effective treatment for FAI at midterm follow-up.

The best treatment for labral tears in patients with FAI remains controversial. Previous reports of labral debridement have shown satisfactory clinical outcomes. Recently, better

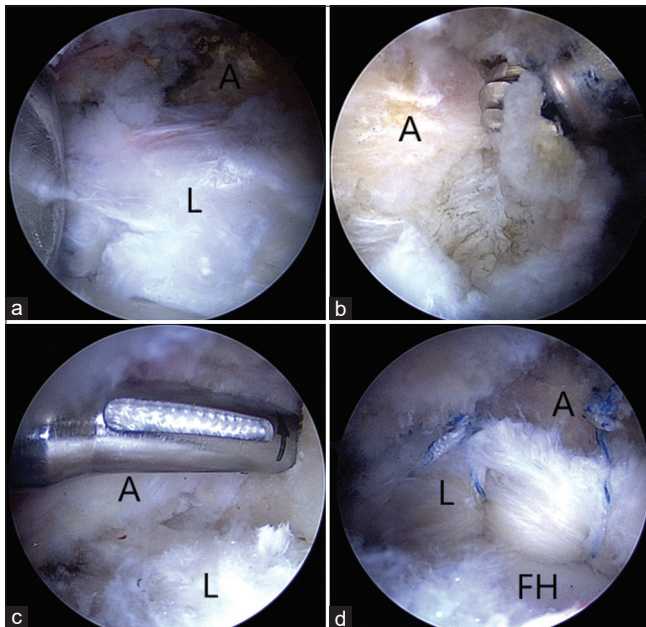


Figure 4: (a) Tear of anterosuperior labrum (A-acetabulum, L-labrum). (b) A high-speed 5.5-mm bur for acetabular rim trimming and preparing the bone bed (A-acetabulum). © 25° angle flex guide (Stryker) to determine the pilot hole (A-acetabulum, L-labrum). (d) Labrum refixation with suture anchors and keep the knots been tied on the capsular side (A-acetabulum, L-labrum, and FH-femoral head)

clinical outcomes have been reported in the labral refixation group than in the labral debridement group. In a comparative study between arthroscopic labral debridement (36 hips, mean follow-up: 21.4 months) and labral refixation (39 hips, mean follow-up: 16.5 months), the mean postoperative MHHS was 94.3 and 88.9 in the refixation and debridement group in the first year, respectively ($P = 0.029$). The failure rate was 11.1% in the debridement group and 7.7% in the labral refixation group ($P > 0.05$).⁸

In a systematic review⁹ of arthroscopic labral repair for FAI, no complications were reported at 2-year follow-up, and patients were allowed to resume sports activities. The revision rate was 4.3% (9210 procedures); 1.9% (4 of 210) of the patients underwent total hip arthroplasty (THA; mean: 37.9 ± 7.5 months).

Arthroscopic treatment of pincer-type FAI has some advantages: (1) it is a minimally invasive procedure, (2) involves real-time intraoperative assessment and correction of FAI bony lesions, (3) early rehabilitation and return to daily activities and work, (4) and low complication rates. However, it is technically demanding and provides limited access to the medial and posterior aspects of the hip joint and thus not suitable for protrusion of the acetabulum and coxa profunda.¹⁰

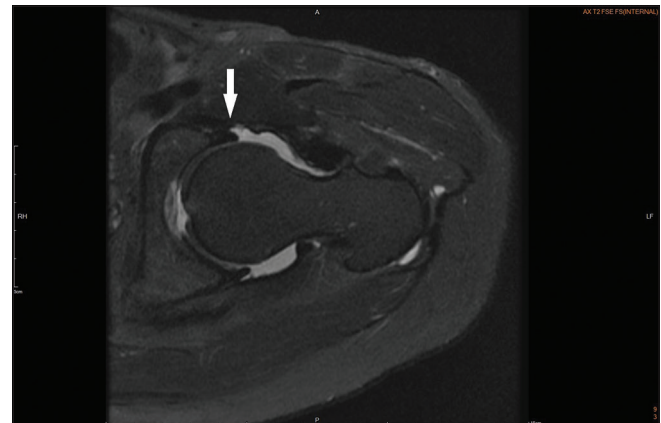


Figure 5: Postoperative 1-year follow-up, normal anterior acetabular coverage (white arrow)

CONCLUSION

Both open and arthroscopic treatments of labral tears of the FAI had good outcomes. Labral refixation results in better clinical outcomes than focal excision/debridement. Arthroscopic acetabuloplasty combined with labral refixation is an effective treatment for labral tears in pincer-type FAI.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In this form, the patient gave her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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