—Case Reports—

Consecutive Bilateral Hip Arthroscopy for Symptomatic Bilateral Femoroacetabular Impingement in an Elite Rugby player: A Case Report

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We report a case of concurrent bilateral hip arthroscopy for symptomatic bilateral femoroacetabular impingement (FAI) performed under the single anesthesia on an elite rugby player. A 27-year-old rugby player who played for a top league had bilateral hip joint pain. Physical examination revealed bilateral tenderness in the anterior area of the hips, with positive impingement signs. Based on the findings of hip radiography and magnetic resonance imaging, the patient's symptoms were diagnosed as bilateral FAI with hip labral tears. Bilateral hip arthroscopy under the single anesthesia was performed due to refractory symptoms. He returned to regular rugby games without any symptoms in either hip. Bilateral hip arthroscopic surgery under the single anesthesia should be an effective treatment for typical and symptomatic FAI, even in elite athletes. (J Nippon Med Sch 2017; 84: 280–285)

Key words: arthroscopy, femoroacetabular impingement, rehabilitation

Background

Femoroacetabular impingement (FAI) is one of the main causes of hip joint pain in the young population and may lead to primary osteoarthritis (OA)[1]. Two classifications of FAI, namely cam and pincer type, are recognized and cause damage to both the articular cartilage and labrum during hip joint movement[2]. Hip arthroscopic surgery for hip disease in young active individuals has been recognized as one of the effective surgical treatments with good clinical results[3]. However, little has been reported about bilateral hip arthroscopic surgery, especially among high-level athletes, in detail. Here, we report a bilateral hip arthroscopy for symptomatic bilateral FAI under the single anesthesia on an elite rugby player.

Case Presentation

A 27-year-old rugby player, who played for a top league in Japan as a flanker, observed left hip joint pain at the beginning of the regular tournament season. Initially, he was suspected to have hip labral injury and had continued to play. However, he continued to experience the pain even in the next season. His pain gradually worsened in spite of intra-articular hip injections of local anesthetic and steroids. Furthermore, he started to feel pain in the right hip joint and visited our institution. No remarkable medical history was reported.

Physical examination revealed bilateral tenderness in the anterior area of the hips, and limited range of motion, particularly internal rotation. Anterior and superior impingement signs were present, as well as the FABER (flexion, abduction, and external rotation) sign bilaterally. Hip radiography revealed no joint space narrowing (**Fig. 1a**), whereas herniation pits in the right hip were observed (**Fig. 1a**). Radiography showed no sign of dysplastic hip, with the lateral center-edge angles being 28° in the right hip and 25° in the left hip, and vertical-center-anterior margin angles in false profile views were 35° in the right hip and 30° in the left hip (**Fig. 1b**). The alpha angles in the lateral views were 78° in the right hip and 76° in left hip (**Fig. 1c**). A decrease in the anterior offset of the femoral neck was observed bilaterally, 6.0 mm in the right hip and 6.4 mm in the left hip (**Fig. 1c**). Magnetic resonance imaging revealed no hydrarthrosis but revealed an anterior labral injury bilaterally (**Fig. 2**). Taking these into consideration, the patient was diagnosed with bilateral FAI with hip labral tears. Bilateral

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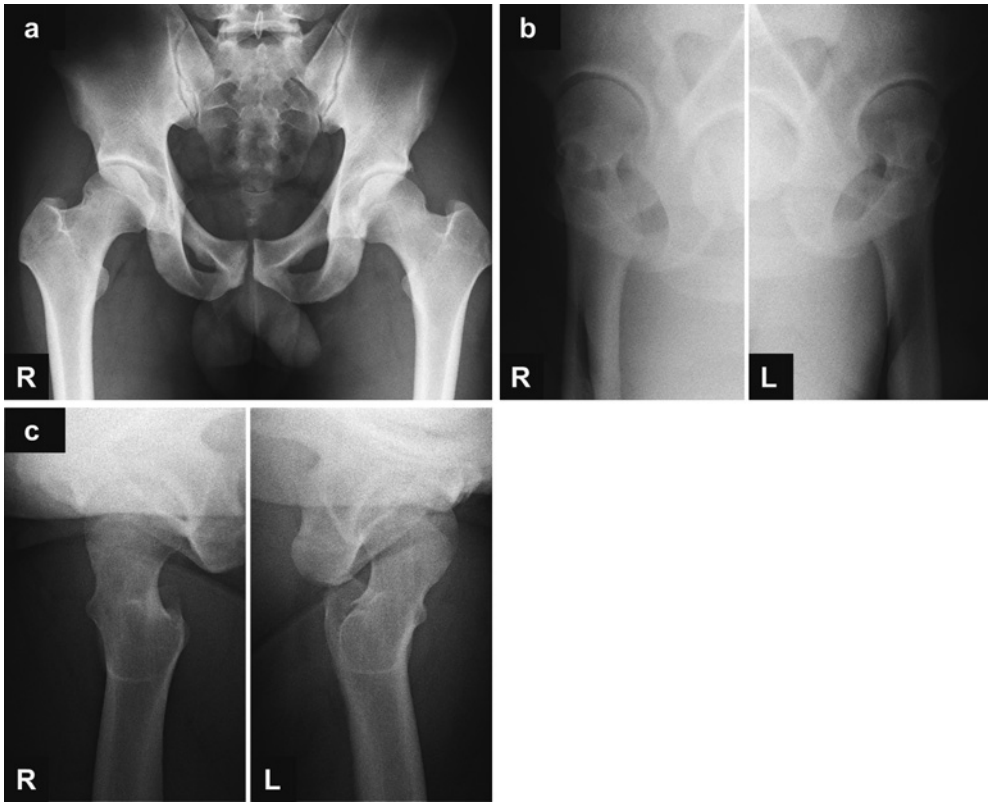

Fig. 1 Plain radiographic image of the hips
a Anteroposterior radiograph of the hips
b False profile views of the hips
c Lateral views of the hips

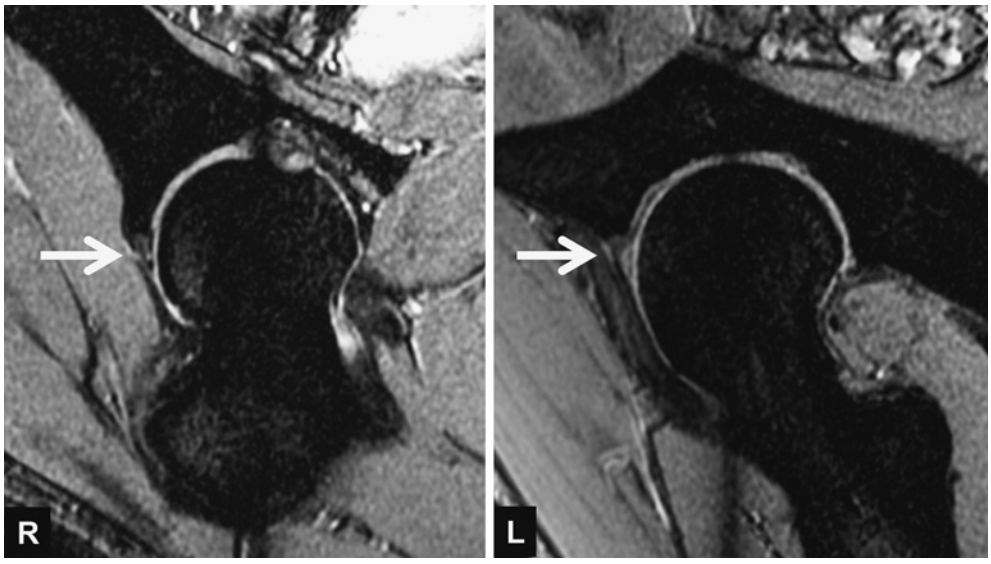

Fig. 2 Magnetic resonance imaging of both hips
White arrows indicate the labral injuries in both hips.

hip arthroscopy under the single anesthesia was performed due to refractory symptoms.

During the procedure, the patient was placed in the supine position and hip arthroscopy was performed with traction apparatus. An anterolateral portal was created under fluoroscopy, and an additional mid-anterior portal was created according to the approach by Phillipon MJ et al[4]. First, we approached the right hip. The articular cartilage of the acetabulum in the anterior weight-bearing area was detached from subchondral bone (**Fig. 3a**); the

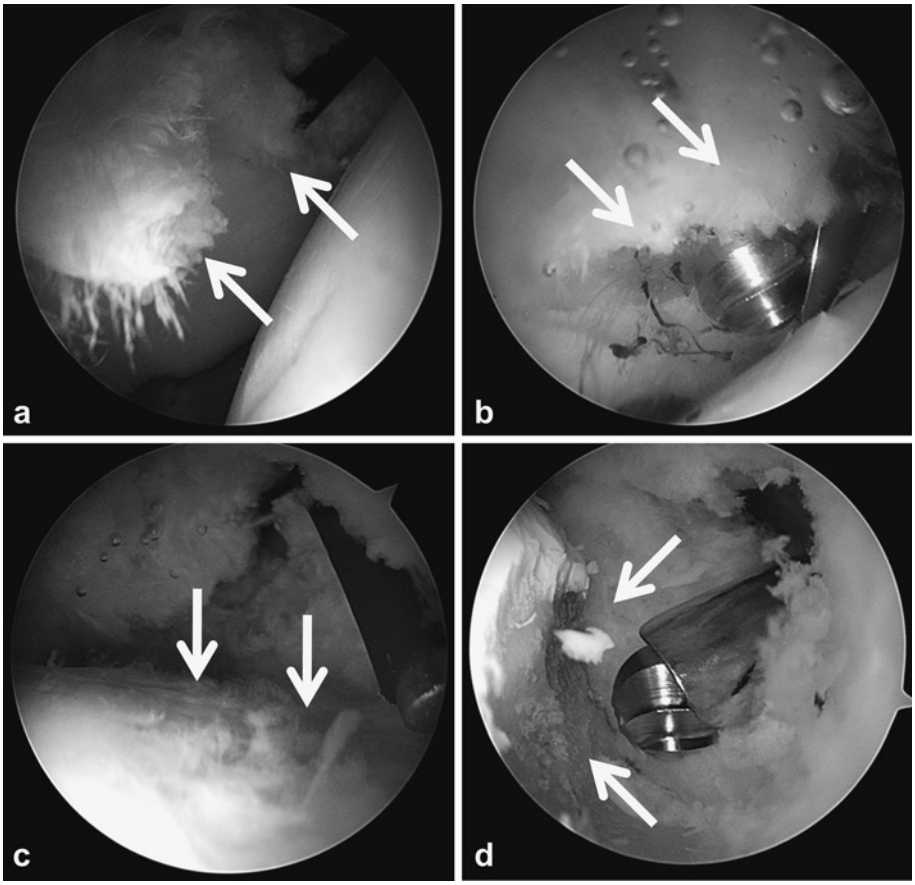

Fig. 3 Intraoperative findings of the right hip
a Articular cartilage avulsion from the subchondral bone at the anterior loading site (**white arrow**)
b Debridement of the articular cartilage and bone marrow stimulation by abrasion (**white arrow**)
c Damage and fibrillation of cartilage at cam lesion (**white arrow**)
d Resection of the cam lesion (**white arrow**)

labrum was fibrillated but intact with an acetabular rim. The size of the articular cartilage defect was approximately 150 mm^2. Therefore, we performed debridement of the flapped cartilage and bone marrow stimulation with an abrasion technique until we could detect bleeding from subchondral bone (**Fig. 3b**). We then assessed the femoral head-neck junction, where we detected a cam lesion with plain radiography. The femoral head-neck offset appeared decreased, and the cartilage at this lesion was damaged and fibrillated (**Fig. 3c**); therefore, cam osteochondroplasty was performed until sufficient offset was achieved (**Fig. 3d**).

Next, we approached the left hip. The hip labrum had a radial flap tear of the anterior to lateral acetabulum, and the articular cartilage at the chondrolabral junction was also damaged (**Fig. 4a**). The damaged cartilage and flapped labrum were trimmed, and the substance of the labrum was repaired with absorbable suture anchors (**Fig. 4b**). A cam lesion was detected at the anterior femoral head-neck junction (**Fig. 4c**), and cam osteochondroplasty was performed (**Fig. 4d**) until no impingement was confirmed on arthroscopy, with the hip joint flexed, and moved in internal and external rotation. We also performed dynamic testing to ensure normal anatomical tracking of the hip joint under fluoroscopy. During dynamic testing, the traction apparatus was slowly released and the assistant surgeon held the patient's lower limb. Both sides of the joint capsule were repaired. On the next day of surgery, continuous passive motion exercises were started. After 3 weeks of no weight bearing, partial weight bearing was started and the range of hip motion exercise was increased. The level of athletic rehabilitation was upgraded at 4 postoperative months, and running was allowed at 5 postoperative months. He was allowed to return to practical games at 7 postoperative months and return to regular rugby games at 10 postoperative

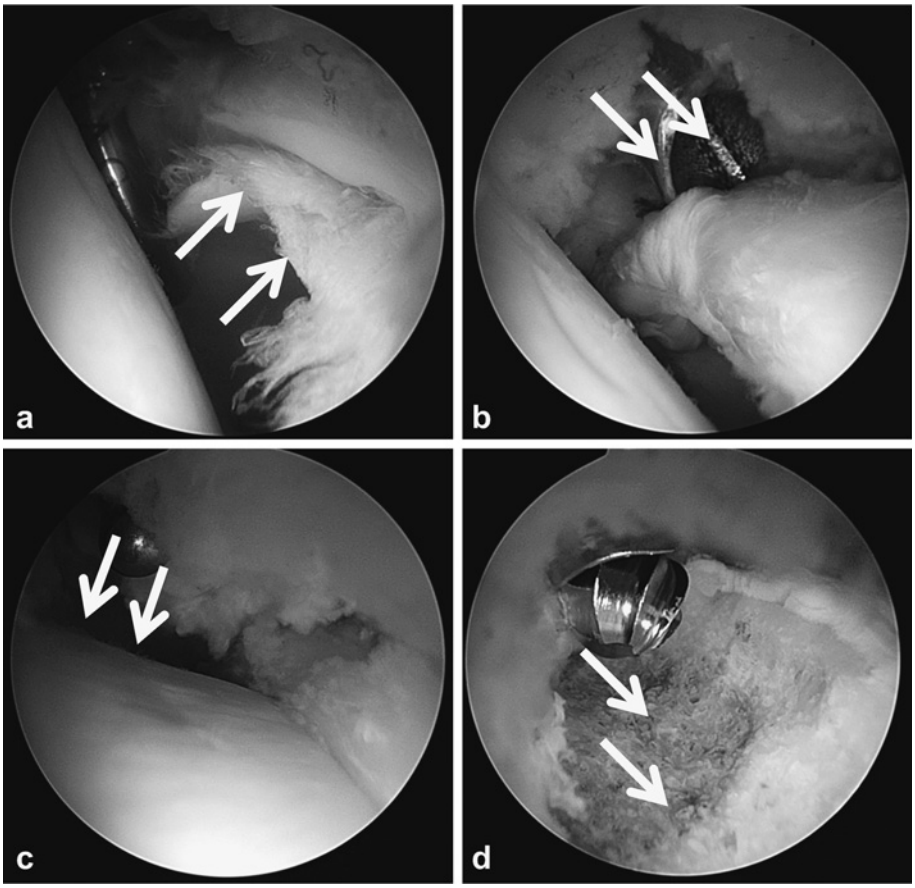

Fig. 4 Intraoperative findings of the left hip
a Labral injury at the anterior and superior areas (**white arrow**)
b Repair of the injured labrum by a mattress suture (**white arrow**)
c Cam lesion at the anterior femoral head neck junction (**white arrow**)
d Resection of the cam lesion (**white arrow**)

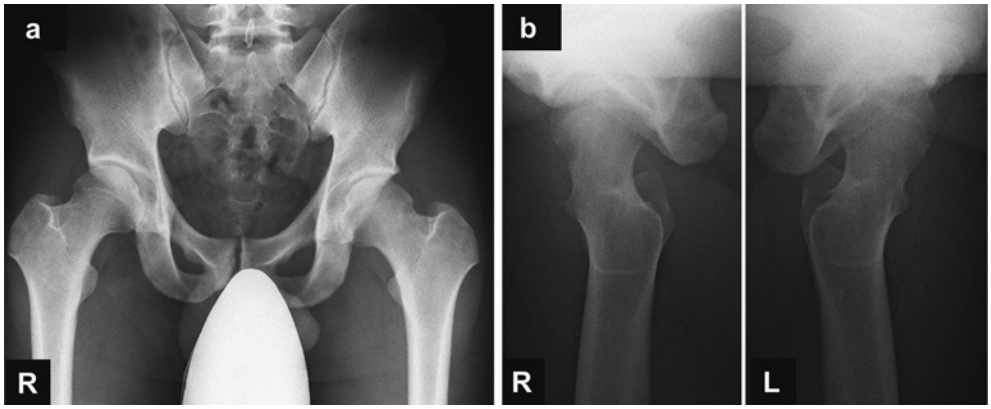

Fig. 5 Postoperative radiographic image of the hips at the latest follow-up
a Anteroposterior radiographic image of the hips
b Lateral views of the hips

months, with no pain bilaterally. He also gained full range of hip motion, and no impingement signs of the hips were observed. Postoperative hip radiography revealed no joint space narrowing, and both alpha angles and anterior offset of the femoral neck were corrected (**Fig. 5a and 5b**). The modified Harris hip scores improved from 84.7 in the right hip and 69.3 in the left hip to 100 in both hips at one year follow-up. The patient provided consent for the publication of this case.

Discussion

Excellent outcomes have been reported after hip arthroscopy to correct FAI and labral tears, with high patient satisfaction and rate of return to activities[5]. The success rate of return to sports activity after hip arthroscopic surgery has been reported to be 92% in general athletes, with 88% of the athletes returning to their original levels[6]. In high-level athletes, this rate has been reported to be as high as 86%, with 81% of the athletes returning to their original levels[7]. With regard to the features of hip disorders in elite athletes, the athletes are more likely to be younger, to be male, and to show a higher prevalence of FAI findings on radiographs[8,9].

Allen et al. reported that 77.8% of patients who have symptomatic FAI had radiographic signs of bilateral FAI and that 26.1% of these patients exhibited symptoms bilaterally[10]. They also suggested that selected bilateral symptomatic FAI patients would benefit from a single surgery, allowing a more rapid return to their activities. The safety of bilateral surgical procedures in other aspects of orthopedics was reported. Bilateral surgical treatments, such as joint replacement surgery and anterior cruciate ligament reconstruction, under the single anesthesia have been recognized to give good clinical results[11–15]. Although the reports with regard to bilateral hip arthroscopic surgery under the single anesthesia are rare when compared with these surgical treatments, Mei-Dan et al. reported good clinical outcomes[16]. They reported that bilateral hip arthroscopic surgery does not lead to higher rates of complication, postsurgical pain, and analgesic use; that the return to daily activities is similar to that in staged hip arthroscopic surgery; and that it may have the benefits of time and cost savings[16].

In contrast, they also mentioned that careful patient selection is important to allow a safe recovery and rehabilitation from bilateral hip arthroscopic surgery. In their study, patients who needed protected weight bearing, owing to microfractures for a large area or borderline dysplasia, were thought to be a contraindication for bilateral surgery. We also would have difficulty fixing the protocol of postoperative rehabilitation, especially in this case, because it should be changed by the pathological findings of the hips during arthroscopic surgery[17]. Furthermore, prolonged traction time may introduce a higher risk of nerve palsy and/or perioperative hypothermia on hip arthroscopic surgery, even though the traction time for one site was almost the same as that in single hip arthroscopy[18,19]. Therefore, we should carefully consider performing bilateral hip arthroscopic surgery simultaneously.

Another issue to consider when we diagnose a patient's hip symptoms as femoroacetabular impingement (FAI) is the coexistence of hip labral tears and/or cartilage defects, because FAI is known to be associated with labral injury and chondral defects[2]. For the surgical procedures in bilateral hip arthroscopy, cam decompression and labral repair were performed in 91.7% and 75%, respectively; we actually performed both in our patient, in addition to procedures for cartilage defects[20]. Although it generally enables direct evaluation of the labrum and cartilage, MRI had a sensitivity of 77–89% and a specificity of 50% for the detection of labral tears, and a sensitivity of 58–83% and a specificity of 50–100% for the detection of cartilage defects[21,22]. Moreover, evaluation of cartilage by standard MRI is difficult because of the relatively thin layer of hip cartilage and the partial volume effects caused by the curved surfaces of the femoral head[23]. Besides, Keeney et al. reported that MRI arthrography could only detect 76% of acetabular labral tears and 62.7% of articular cartilage lesions when compared with arthroscopy[24]. In contrast, the frequency of chondral lesions in hip arthroscopy for femoroacetabular impingement is high, affecting up to 67.3% of patients[25]. Based on these etiologies and findings, we should always prepare for both labral injury and cartilage defect despite the usefulness of MRI for preoperative assessment. The use of advanced cartilage imaging techniques, such as delayed gadolinium-enhanced MRI of cartilage (dGEMRIC), T1 rho, and T2 mapping, should also be considered[23].

Our patient was a high-level athlete who had a typical bilateral symptomatic FAI. As for the factors that led to the poor results of hip arthroscopic surgery, Phillipon et al[5] reported that independent predictors of an inferior outcome and patient satisfaction were an age of >30 years and a joint space of <2 mm. This patient was younger than 30 and had no radiographic signs of OA and developmental hip dysplasia. Furthermore, he had a good rehabilitation environment in his team to protect and strengthen his hip joint mobility. Therefore, we performed bilateral arthroscopic hip surgery under the single anesthesia as the relative indication and obtained a good clinical result. However, we must recognize the need for long-term follow-up.

Conclusions

Bilateral hip arthroscopic surgery under the single anesthesia should be an effective treatment for typical and symptomatic FAI even in elite athletes.

Conflict of Interest: The authors declare that they have no conflict of interest.

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