



Case Report

Anterior inferior iliac spine avulsion fracture post hip arthroscopy for Femoroacetabular impingement^{☆,☆☆}

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ARTICLE INFO

Keywords:

Hip
Arthroscopy
AIIS

ABSTRACT

FAI (Femoroacetabular Impingement) is an uncommon yet reported pathology of the hip joint, especially in the young athletic population. If left untreated, it predisposes for premature osteoarthritis of the hip. FAI treatment modalities consists of either open or arthroscopic surgery, the latter becoming the most adapted modality. We present a case of a young male athlete found to have FAI, treated arthroscopically. His post operative follow up was complicated by anterior inferior iliac spine avulsion fracture due to post op protocol non compliance which was treated with ORIF, with satisfactory non symptomatic outcome.

Introduction

Femoroacetabular impingement (FAI) is a cause of chondral lesions, labral tears and hip pain among young adults [1] and in particular among athletes [2]. It is also a cause of osteoarthritis of the hips [3]. This condition presents a major cause of degenerative hip outcome [4]. Previously, the standard treatments of FAI was surgical hip dislocation and open osteochondroplasty [5]. Currently, arthroscopic repair has become the standard in such cases [6]. The arthroscopic technique follows the same precautions and steps as an open surgical procedure [6]. As any other surgical procedure, the arthroscopic technique presents many challenges to the surgeon and is prone to post-operative complications.

This report discusses the case of a 21-year-old male patient who was found to have an anterior inferior iliac spine avulsion fracture 11 months post hip arthroscopy for femoroacetabular impingement. According to a review of literature on hip arthroscopy complications, few similar cases were reported [7].

Case report

This is the case of a 21-year-old male patient who presented with right hip pain upon exercise. X-ray (Fig. 1A and B) and MRI (Fig. 1C) revealed right hip mixed femoroacetabular impingement (Pincer and CAM lesions). He underwent right hip arthroscopy using traction table for his FAI in 2015 with satisfying post-op results. Both CAM and pincer lesions were debrided using a burr.

[☆] No funds were received in support of this study.

^{☆☆} The authors declare no conflict of interest regarding the publication of this article.

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Fig. 1. (A) Pelvis AP X-ray showing mixed femoroacetabular impingement (B) Lateral hip. X-ray showing mixed femoroacetabular impingement (C) MRI T1 coronal cut showing right hip mixed femoroacetabular impingement.

Adequate resection was verified with fluoroscopy, with the involved part of the labrum being stable, requiring no further fixation.

At his 1-month follow-up, he had full range of motion and reported minimal pain. Patient started resuming his sports activities progressively with no to minimal pain. His activities consisted mainly of soccer and running. On his 6 months follow-up, patient presented with diffuse pain in his right groin area that intensifies with any hip movement. He was advised to lower his exercising intensity and stop forceful kicking sports. 11 months post-op, his right groin pain persisted and became prominent mostly with hyperextension of his hip. He reports no history of trauma. X-ray (Fig. 2A), CT scan (Fig. 2B) and MRI (Fig. 2C) revealed an anterior inferior iliac spine avulsion fracture. Therefore, the patient underwent open reduction and internal fixation using the anterior approach, reattachment of rectus femoris to its anatomical location on the anterior inferior iliac spine using cannulated screw and two anchors (Fig. 3). Two months post-op, the patient regained full range of motion of his hip and was pain free.

Currently, patient remains pain free with return to normal previous activities without any complaints.

Discussion

The complications rate in hip arthroscopy was found to be 15% [1]. Complications included traction-related, surgical technique related and outcome-related problems. Traction-related problems can be traced to nerve injuries resulting from traction [1], often caused to the sciatic nerve [8]. Surgical technique-related problems can be caused by breakage or failure of instruments, among which causing labral perforation, femoral head scuffing, labrum injury occurring among patients with stiff joints, etc. The outcome-related complications include heterotopic bone formation along the gluteus medius as well as rapid progression towards osteoarthritis [1]. Other complications found in the literature included avascular necrosis of femoral head, DVT, infection, transitory paresthesia of the pudendal nerve, etc. [4,8].

Rectus femoris injuries more often occur in young athletes, rarely in the adult population. They usually are a result of forceful kicking with abrupt arrest, causing avulsion of the rectus femoris at the anterior inferior iliac spine. Other described mechanisms consist of sudden deceleration in running sports and hip hyperextension with a flexed knee [7]. It has been postulated that patients who underwent hip arthroscopy for FAI are prone to these injuries more than individuals with no previous surgery, lowering the threshold for injury [7].

Operative vs non operative management of such injuries has been described in the literature [9,10]. Hsu et al. reported the cases of two American football athletes who underwent non operative treatment, returning to kicking and normal activities at 6 weeks.

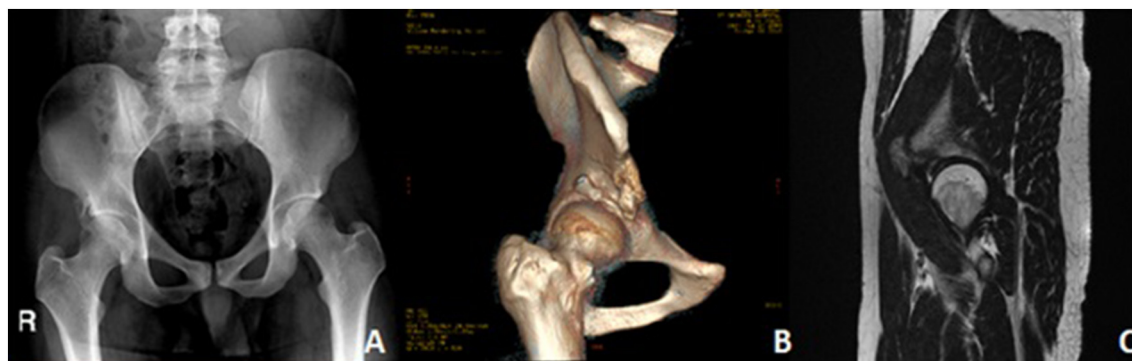


Fig. 2. (A) X-ray pelvis ap showing AIIS avulsion fracture. (B) CT scan reconstruction showing AIIS avulsion fracture. (C) Sagittal T2 MRI showing avulsion fracture of AIIS.



Fig. 3. Right hip post AIIS avulsion fracture reduction and fixation.

Furthermore, a case series of 11 american football players reported by Gamradt et al. returned to full activity after conservative treatment. Five cases of AIIS avulsion sustained by four football players are described by Irmola et al. [11]. They underwent operative treatment using suture anchors followed by protective hip bracing, with return to normal sports activity 9 months post-op. The surgery of two of these patients was complicated by lateral cutaneous nerve palsy.

Conclusion

Numerous complications may occur following a hip arthroscopy, including traction-related, surgical-technique related and outcome-related problems. The anterior inferior iliac spine avulsion fracture was not among the complications. The fracture described in this case report might be the result of a surgical complication but could also have a different origin, such as a trauma that was unnoticed and reported by the patient, taking into consideration the nature of his sports activities consisting of forceful kicking and hip hyperextension. Conservative management is of high importance in AIIS avulsion fractures, however when this fails, surgical repair is required; hence surgeons should always weigh the benefits of surgery taking into account the high complication rate in hip arthroscopy.

Acknowledgements

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Rami Ayoubi: Writing, editing

Mohammad Darwish: Editing, Review

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References

- [1] M.S. Park, S.J. Yoon, Y.J. Kim, W.C. Chung, Hip arthroscopy for femoroacetabular impingement: the changing nature and severity of associated complications over time, *Arthroscopy: The Journal of Arthroscopic & Related Surgery* 30 (8) (2014) 957–963.
- [2] J.T. Byrd, K.S. Jones, Arthroscopic management of femoroacetabular impingement in athletes, *Am. J. Sports Med.* 39 (1_suppl) (2011) 7–13.
- [3] A. Bedi, B.T. Kelly, Femoroacetabular impingement, *JBJS* 95 (1) (2013) 82–92.
- [4] B.D. Roos, M.V. Roos, A. Camisa Júnior, E.M.U. Lima, D.P. Gyboski, L.S. Martins, Extracapsular approach for arthroscopic treatment of femoroacetabular impingement: clinical and radiographic results and complications, *Rev. Bras. Ortop.* 50 (4) (2015) 430–437.
- [5] M. Beck, M. Kalhor, M. Leunig, R. Ganz, Hip morphology influences the pattern of damage to the acetabular cartilage: femoroacetabular impingement as a cause of early osteoarthritis of the hip, *The Journal of bone and joint surgery. British volume* 87 (7) (2005) 1012–1018.
- [6] V.M. Ilizaliturri, Complications of arthroscopic femoroacetabular impingement treatment: a review, *Clin. Orthop. Relat. Res.* 467 (3) (2009) 760–768.
- [7] B.M. Devitt, B. Smith, R. Stapf, J.M. O'Donnell, Avulsion of the direct head of rectus femoris following arthroscopic subspine impingement resection: a case report, *Journal of Hip Preservation Surgery* 3 (1) (2015) 56–60, <https://doi.org/10.1093/jhps/hnv072>.
- [8] M.J. Philippon, A.J. Stubbs, M.L. Schenker, R.B. Maxwell, R. Ganz, M. Leunig, Arthroscopic management of femoroacetabular impingement: osteoplasty technique and literature review, *Am. J. Sports Med.* 35 (9) (2007) 1571–1580.

- [9] S.C. Gamradt, R.H. Brophy, R. Barnes, et al., Nonoperative treatment for proximal avulsion of the rectus femoris in professional American football, *Am. J. Sports Med.* 37 (2009) 1370–1374.
- [10] J.C. Hsu, D.A. Fischer, R.W. Wright, Proximal rectus femoris avulsions in national football league kickers: a report of 2 cases, *Am. J. Sports Med.* 33 (2005) 1085–1087.
- [11] T. Irmola, J.T. Heikkila, S. Orava, et al., Total proximal tendon avulsion of the rectus femoris muscle, *Scand. J. Med. Sci. Sports* 17 (2007) 378–382.