

Acetabular Retrograde Drilling: A New Arthroscopic Technique for Treatment of Chondral Lesions Grade 1 and 2 in Patients with Femoroacetabular Impingement

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Abstract

Introduction: Acetabular chondral lesions in patients with femoroacetabular impingement are common findings in a surgical procedure. At present arthroscopic management has been proven effective in most cases treated. Poor results of this treatment have been attributed, among other things, to presence of these articular lesions. Several management alternatives have been described, however most of these options were devised for the treatment of grade 3 and 4 cartilage injuries. Actually, there are not good alternatives for the treatment of lesions grade 1 and 2 during hip arthroscopy in patients with femoroacetabular impingement. The aim of our work is present a new surgical technique of arthroscopic retrograde drilling for treatment of grade 1 and 2 acetabular chondral lesions in patients with femoroacetabular impingement.

Indications: Grade 1 and 2 acetabular chondral lesions identified during hip arthroscopy in patients with femoroacetabular impingement.

Surgical Technique: Through anterior and anterolateral arthroscopic portals, acetabular retrograde drilling is performed from the capsular side of the acetabular rim, to the cartilage detachment zone, without interrupting the indemnity of the articular cartilage surface.

Conclusion: Acetabular retrograde drilling is a new arthroscopic treatment alternative for acetabular chondral lesions grade 1 and 2 associated with femoroacetabular impingement. Is technically simple, inexpensive, reproducible and does not interfere with rehabilitation.

Keywords: Hip, Hip arthroscopy, Femoroacetabular impingement, Chondral lesions of the hip, Acetabular articular cartilage

Introduction

Acetabular chondral lesions associated to Femoroacetabular Impingement (FAI) are common findings in hip arthroscopy, with an incidence reported between 78% to 97% of the cases [1,2]. At present there are different alternatives in relation to management of this kind of lesions, being arthroscopic treatment of FAI has been proven effective in most cases [2]. Poor results have been attributed, among other things, to acetabular chondral lesions [2,3].

Several treatment alternatives have been described for the management of the acetabular chondral lesions; mechanical debridement [4-11], radiofrequency regularization [6,12], microfracture, fibrin clot injection and suture of the cartilage flap [13,14]. Last treatments include platelet-rich plasma and use of stem cells associated or not to scaffolds. However, most of these options were devised for the treatment of grade 3 and 4 cartilage injuries according classification proposed by Konan et al. [15] (Table 1, classification of Konan).

Thermal chondroplasty with radiofrequency, is a common treatment for grade 1 and 2 chondral lesions, however chondrolysis has been reported [16-18].

Microfracture is a bone marrow stimulant procedure that promotes the advent of mesenchymal cells in order to achieve repair of articular cartilage, indicated for treatment of grade 4 lesions. It also has been used in grade 3 lesions to stimulate the adhesion of the cartilage flap to subchondral bone [6,19]. However, as microfractures are performed from the joint space to the subchondral bone of acetabulum they should not be used in grade 1 and 2 lesions, because it implies disruption of the

Grade	
0	Normal cartilage
1	Loss of fixation to the subchondral bone, positive wave sign
2	Cleavage tear
3	Delamination of articular cartilage
4	Exposed bone in the acetabulum
	Konan S, et al. J Bone Joint Surg Br.2011

Table 1: Arthroscopic classification for acetabular chondral lesions in patients with FAI. intact articular cartilage surface [19].

For the arthroscopic treatment of grade 1 and 2 chondral lesions, and under the microfracture concept [6,19], we propose a retrograde drilling, from the acetabular rim to the detachment zone of the chondral lesion, maintaining the acetabular cartilage surface indemnity. The aim of the acetabular retrograde drilling is to bring bone marrow precursors to promote the adhesion of the detached cartilage to the subchondral bone, without interrupting the indemnity of the articular cartilage surface.

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Objective

To present a new surgical technique of arthroscopic retrograde drilling for the treatment of grade 1 and 2 acetabular chondral lesions in patients with femoroacetabular impingement.

Operative technique

Indications

Acetabular chondral lesions grade 1 and 2 according to Konan [15] identified during arthroscopy in patients with femoroacetabular impingement.

Surgical Technique

The patient is placed in supine position on a fracture table. Anterior and anterolateral arthroscopic portals are performed. During the inspection of central compartment the acetabular labrum and articular cartilage are evaluated. If a grade 1 or 2 chondral lesion is identified (Figure 1), the size is estimated and palpated to make sure that it is not a grade 3 lesion. Then, keeping joint distraction, the acetabular retrograde drilling is performed. Using the same portals and through the working cannula, the drill guide is positioned. The entry point in the acetabular rim is immediately above the labrum, at the chondral lesion level (Figure 2). With a 2.3 mm drill, from superior to inferior, towards the joint, the drilling is performed. The drill is directed to the detachment zone, reaching the base of the chondral lesion (Figure 3A, 3B and 3C), until movement of loose acetabular cartilage is observed, taking care not to pierce the surface. Two drill holes per square centimeter are made. In case of associated labral detachment, it is reinserted with anchors.

Rehabilitation

From the same day of surgery, joint range of motion exercises are performed, full weight bearing is allowed, and a cane is used as needed for 1 to 2 weeks.

Discussion

The acetabular retrograde drilling is a procedure that stimulates the arrival of bone marrow precursors to promote the adhesion of detached

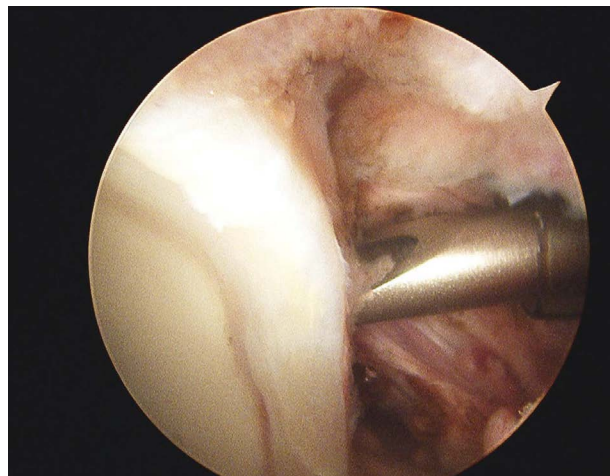


Figure 2: Arthroscopic view showing the entry point of the drill in the acetabular rim.

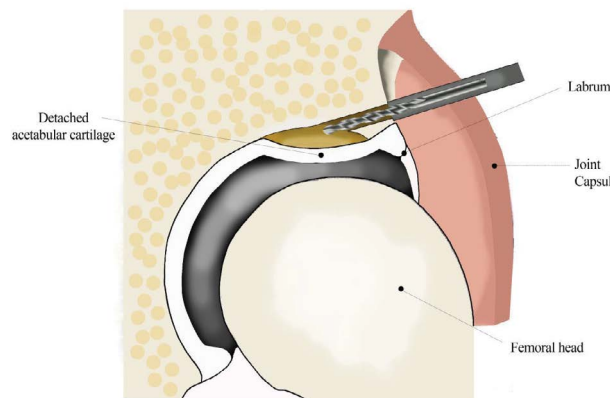


Figure 3A: Schematic drawings of the surgical technique of arthroscopic retrograde drilling.

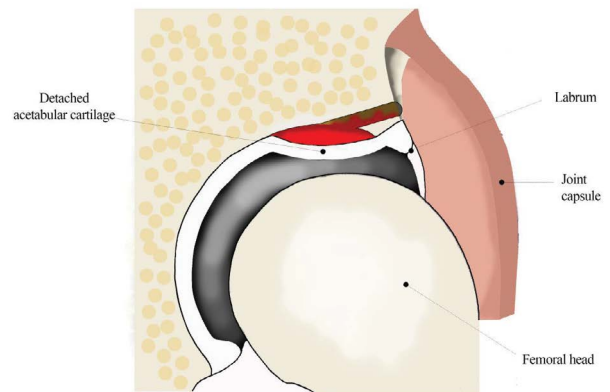
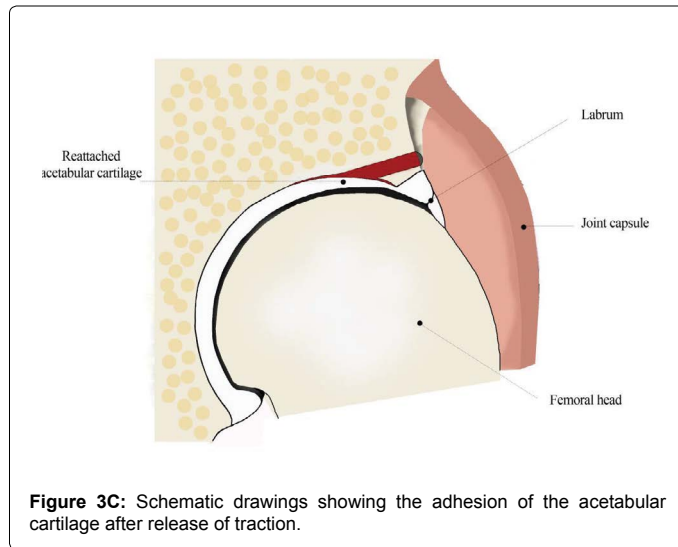


Figure 3B: Schematic drawings showing the bleeding and the arrival of bone marrow precursors to promote the adhesion of detached cartilage to the subchondral bone.



Figure 1: Arthroscopic view showing grade 2 acetabular chondral lesion with detached cartilage from the subchondral bone in a patient with FAI.



cartilage to the subchondral bone, without interrupting the indemnity of the articular cartilage surface. According to Sampson, these bone marrow precursors help in the attachment of the detached cartilage to the subchondral bone [6]. The retrograde drilling is indicated in chondral lesions grade 1 and 2. It is a relatively simple and reproducible technique that requires no specialized instruments or fluoroscopic vision, and does not add extra supplies that raise the cost of the surgery.

Medium and long term follow up of our patients will allow us to evaluate the effectiveness of this technique.

Conclusion

Acetabular retrograde drilling is a new arthroscopic treatment alternative for acetabular chondral lesions grade 1 and 2 associated with FAI. Is technically simple, inexpensive, reproducible and does not interfere with rehabilitation.

References

1. Meermans G, Konan S, Haddad FS, Witt JD (2010) Prevalence of acetabular cartilage lesions and labral tears in femoroacetabular impingement. *Acta Orthop Belg* 76: 181-188.
2. Byrd JW, Jones KS (2011) Arthroscopic management of femoroacetabular impingement: minimum 2-year follow-up. *Arthroscopy* 27: 1379-1388.

3. Anderson LA, Crofoot CD, Erickson JA, Peters CL (2009) Staged surgical dislocation and redirection of periacetabular osteotomy: a report of five cases. *J Bone Joint Surg Am* 91: 2469-2476.
4. Beaulé PE, Campbell P, Lu Z, Leunig-Ganz K, Beck M, et al. (2006) Vascularity of the arthritic femoral head and hip resurfacing. *J Bone Joint Surg Am* 88 Suppl 4: 85-96.
5. Sampson (2005) Hip morphology and its relationship to pathology: dysplasia to impingement. *Oper Tech Sports Med* 13: 37-45.
6. Sampson TG (2011) Arthroscopic treatment for chondral lesions of the hip. *Clin Sports Med* 30: 331-348.
7. Wettstein M, Dienst M (2006) [Hip arthroscopy for femoroacetabular impingement]. *Orthopade* 35: 85-93.
8. Clohisy JC, McClure JT (2005) Treatment of anterior femoroacetabular impingement with combined hip arthroscopy and limited anterior decompression. *Iowa Orthop J* 25: 164-171.
9. Stähelin L, Stähelin T, Jolles BM, Herzog RF (2008) Arthroscopic offset restoration in femoroacetabular cam impingement: accuracy and early clinical outcome. *Arthroscopy* 24: 51-57.
10. Philippon MJ, Schenker ML, Briggs KK, Kuppersmith DA, Maxwell RB, et al. (2007) Revision hip arthroscopy. *Am J Sports Med* 35: 1918-1921.
11. Philippon MJ, Stubbs AJ, Schenker ML, Maxwell RB, Ganz R, et al. (2007) Arthroscopic management of femoroacetabular impingement: osteoplasty technique and literature review. *Am J Sports Med* 35: 1571-1580.
12. Yen YM, Kocher MS (2010) Chondral lesions of the hip: microfracture and chondroplasty. *Sports Med Arthrosc* 18: 83-89.
13. Tzaveas AP, Villar RN (2010) Cyst-like lesion of the acetabular roof - an abnormal finding or an anatomical variant? *Hip Int* 20: 258-260.
14. Sekiya JK, Martin RL, Lesniak BP (2009) Arthroscopic repair of delaminated acetabular articular cartilage in femoroacetabular impingement. *Orthopedics* 32.
15. Konan S, Rayan F, Meermans G, Witt J, Haddad FS (2011) Validation of the classification system for acetabular chondral lesions identified at arthroscopy in patients with femoroacetabular impingement. *J Bone Joint Surg Br* 93: 332-336.
16. Kaplan LD (2003) The analysis of articular cartilage after thermal exposure: "Is red really dead?". *Arthroscopy* 19: 310-313.
17. Kaplan LD, Ernsthause JM, Bradley JP, Fu FH, Farkas DL (2003) The thermal field of radiofrequency probes at chondroplasty settings. *Arthroscopy* 19: 632-640.
18. Lu Y, Edwards RB, Cole BJ, Markel MD (2001) Thermal chondroplasty with radiofrequency energy. An in vitro comparison of bipolar and monopolar radiofrequency devices. *Am J Sports Med* 29: 42-49.
19. Crawford K, Philippon MJ, Sekiya JK, Rodkey WG, Steadman JR (2006) Microfracture of the hip in athletes. *Clin Sports Med* 25: 327-335.

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