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Clinical case

Osteochondritis dissecans of the capitellum: Autologous osteochondral mosaicplasty. A case report

Ostéochondrite disséquante du capitellum : autogreffe ostéochondrale en mosaïque. Un cas clinique

M. Allagui *, M. Koubaa, Z. Bellaj, K. Amara, I. Aloui, M.F. Hamdi, A. Abid

Department of Orthopaedic Surgery, Monastir, Tunisia

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Abstract

The etiology of osteochondritis dissecans (OCD) of the capitellum is unknown but has generally been attributed to repetitive microtrauma or ischemia. We present a case report of a handball player with OCD of the capitellum. Preoperatively, he complained of elbow pain. CT imaging showed the injury. This patient was treated with mosaicplasty harvested from the lateral femoral condyle. He returned to his full former sports activities within 6 months of surgery. The continuity of the cartilage layer between the osteochondral graft and the capitellum was shown on CT arthrogram images at 12 months after surgery. We believe that mosaicplasty gives successful results with end-stage OCD of the capitellum.

Keywords: Osteochondritis dissecans; Mosaicplasty; Capitellum; Elbow

Résumé

L'étiologie de l'osteochondrite disséquante du capitellum (OCD) est inconnue, mais elle est généralement attribuée à des microtraumatismes répétés ou à un accident ischémique. Nous rapportons le cas d'un handballeur, qui présente une OCD du capitellum, venu consulter pour une douleur du coude. Le scanner a confirmé le diagnostic. Il lui a été fait une mosaïcplastie aux dépens de condyle fémoral externe. À six mois postopératoire, le patient a retrouvé son activité sportive initiale. Après un recul de 12 mois, l'arthro-scanner de contrôle a montré la continuité du cartilage entre le greffon et le capitellum. Nous pensons que la mosaïcplastie donne des résultats anatomo-fonctionnels satisfaisants dans le traitement des OCD du capitellum.

Mots clés : Ostéochondrite disséquante ; Mosaïcplastie ; Capitellum ; Coude

1. Introduction

Osteochondritis dissecans (OCD) of the humeral capitellum is a cause of chronic elbow pain in adolescents and young athletes. This disease generally affects adolescent athletes engaged in repetitive over-head or upper extremity weight-bearing activities and consists of a localized injury involving the articular surface of the capitellum.

The etiology of OCD of the capitellum is unknown, but contributing factors are believed to include repetitive valgus compressive loads, such as those experienced during throwing, in conjunction with an immature articular cartilage surface over a poorly vascularized capitellum. This could lead to localized injury of subchondral bone of the humeral capitellum, characterized by focal avascular necrosis and subchondral osseous changes [1]. Consequently, loss of support for the overlying articular cartilage may lead to breakdown and formation of loose bodies [1,2].

The clinical findings associated with OCD include the insidious onset of elbow pain aggravated by activity and relieved by rest. In a later stage of the disease, there may be

* Corresponding author.
E-mail address: medallagui@yahoo.fr (M. Allagui).

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mechanical symptoms related to the formation of loose bodies. On physical examination, the patient may experience pain and swelling at the radio-capitellar joint and decreased range of flexion and extension [3,4].

The treatment of advanced lesions is challenging, and many surgical procedures have been reported. The aim of surgical treatment is to restore osteochondral integrity. Mosaicplasty has provided successful treatment of osteochondral defects in the knee and ankle joints [5]; recently mosaicplasty has been advocated for severe OCD in baseball players to reproduce the normal hyaline cartilage and gain long-term success in elbow function [6,7]. The basic purpose of this procedure is to facilitate regrowth and regeneration of hyaline cartilage, which is biomechanically superior to fibrous cartilage as a tissue material of the articular surface [8].

2. Case report

A 17-year-old right-hand-dominant male, handball player in the regional team presents with a history of a painful right elbow. The problem had started 3 years previously. Physical examination revealed slight swelling of the right elbow, tenderness around the radio-humeral joint, and the mean range of elbow motion was -15° of extension and 130° of flexion with pain during maximal extension. Pronation and supination were not restricted.

The standard antero-posterior (AP) and lateral radiographs of the elbow were normal with a closed growth plate.

CT-arthrography showed a large cartilaginous defect with no intra-articular loose bodies (Fig. 1). This injury was considered unstable and a mosaicplasty was indicated. The patient was operated under general anesthesia in lateral decubitus position (Fig. 2), with a small padded arm support. The affected extremity and the ipsilateral leg were draped after applying two pneumatic tourniquets on the arm and thigh. The operation was performed through the lateral Kocher approach between the anconeus and extensor carpi ulnaris; the lesion was visualized with extreme flexion of the elbow.

The site was prepared and the optimal depth of filling of the defect was determined. To harvest cylindrical osteochondral graft, a lateral para-patellar miniarthrotomy of the knee homolateral to the involved elbow was then performed. A cylindrical 10 mm diameter osteochondral graft was harvested from the lateral periphery of the femoral condyle. The graft was transplanted to the prepared osteochondral defect in the capitellum (Fig. 3). The elbow was immobilized in a plaster cast for three weeks followed by re-education.

Fig. 2. Lateral decubitus position of patient.

Six months after surgery, the elbow was painless with a full range of motion.

The CT arthrogram images taken 24 months after surgery showed continuity of the cartilage layer between the osteochondral graft and the capitellum (Fig. 4).

3. Discussion

OCD of the capitellum can be a cause of elbow pain in an adolescent. This disease generally affects male patients between the ages of 12 and 21. The disease begins with subchondral bone flattening and progresses to rarefaction and eventually to fragmentation, creating the loose bodies that cause the mechanical symptoms [9]. In our case, the onset of symptoms reportedly occurred within a few years before the treatment; however, this disease process could have been initiated many years prior to the clinical complaints.

The ideal treatment for OCD of the capitellum has not been established yet. Conservative treatment has only limited ability to heal the peeled chondral fragment, and gives poor results [10]. Arthroscopic surgery consisting of removal of a loose body or a chondral fragment, synovectomy, abrasion, or drilling

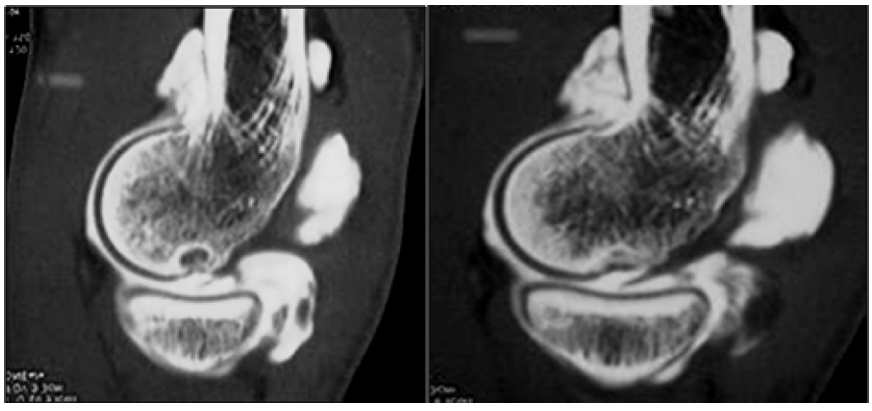

Fig. 1. Computed tomography arthrography showed an unstable osteochondral lesion of the capitellum (13 mm).