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Case Report

Osteochondritis dissecans of the trochlea: case report☆

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ABSTRACT

The authors report a rare case of osteochondritis dissecans of the trochlea. The treatment of these lesions, in which the osteochondral fragment is not viable, is difficult and often limited in Brazil. A clinical case is presented with functional and radiological outcomes after treatment with microfracture technique, bone graft, and collagen membrane coverage.

Osteocondrite dissecante da tróclea: relato de caso

Palavras-chave:
Articulação do joelho
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Osteocondrite dissecante

RESUMO

Os autores relatam um caso raro de osteocondrite dissecante de tróclea. O tratamento dessas lesões com inviabilidade do fragmento osteocondral é difícil e muitas vezes limitado no nosso meio. Os autores apresentam resultados clínicos e radiológicos após o tratamento com a técnica de microfratura, enxertia óssea e cobertura com membrana de colágeno.

☆ Study conducted at Universidade Federal de São Paulo (Unifesp), Escola Paulista de Medicina, Departamento de Ortopedia e Traumatologia, Grupo do Joelho, São Paulo, SP, Brazil.

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Introduction

Osteochondritis dissecans (OD) of the knee is an idiopathic, acquired, and focal lesion of the subchondral bone, which may involve the adjacent articular cartilage. It occurs mainly in active children and adolescents, affecting the femoral condyles of the knee. The patella (5–10%) and the trochlea (0.6–1%) are among the least-affected areas. The scientific literature on OD of the trochlea is scarce, and there is no consensus on the best treatment options.[1]

Treatment of juvenile OD is based on preservation of the prominent osteochondral fragment, and efforts are made to reinsert these fragments using metallic or absorbable screws.[2] In adult OD, the viability of the osteochondral fragment must be taken into account. If the fragment is viable, it is treated as the juvenile OD; if not, treatment follows the precepts of that for adult osteochondral lesions.[2] Because these are extensive lesions with subchondral bone involvement, subchondral bone and cartilage repair techniques are used. The techniques include autologous osteochondral transplantation (mosaicplasty), fresh homologous osteochondral transplantation,[2–4] and bone grafting with collagen membrane/autologous matrix-induced chondrogenesis (AMIC®) treatment,[5–7] recently made available in Brazil.

Clinical case description

Male patient, 19 years of age, with history of pain and knee effusion two years after sports practice. He had practiced recreational football for four years. He denied instability and current or previous trauma. At physical examination, he presented hypotrophy of the left quadriceps, symmetrical range of motion (ROM; 5° recurvatum and 140° of flexion), joint effusion +2/+4, and patellar pain at compression (positive Rabot). The preoperative magnetic resonance image (Fig. 1) showed joint effusion and osteochondral lesion of the lateral trochlear region (2.2° × 1.7° × 0.6 cm) with penetration of synovial fluid in to the bed of the lesion, signs that are characteristic of osteochondral fragment instability. The imaging exam also showed signs of chronic lesion, with the presence of subcortical cysts, bone edema at the base of the lesion, and partial bone marrow discontinuity of this fragment with horizontal orientation.

In the intraoperative period, the osteochondral lesion was unstable but not displaced (ICRS osteochondritis classification: Grade 3). The fragment measured 2.5 cm × 2.6 cm × 0.7 cm, with rounded edges, yellowish color, signs of bone resorption of the subchondral region, and deep osteochondral cleft (typical signs of non-viability) (Fig. 2).

The authors chose to resect the lesion and use de microfracture technique for treatment, using collagen membrane (AMIC®) associated with bone grafting for coverage. A lateral parapatellar incision was made; the retinaculum and joint capsule were opened, and the osteochondral fragment was identified and resected. The wound bed was debrided with a curette. The edges of the lesion were cut vertically and microfractures were made with a small joint icepick.

An opening was made in the lateral cortical of the femur and the cancellous bone graft was removed with a curette. The bone graft was impacted at the bottom of the osteochondral lesion up to one millimeter above the level of the adjacent subchondral bone. The defect was measured, and the porcine collagen membrane (Chondro-Gide/Geistlich®) was cut to fit, and sutured with monochryl 5.0. Fibrin glue was placed at the edges of the membrane as an additional sealing and fixation method (Fig. 3).

In the immediate postoperative period, full weight-bearing in full extension (knee brace) was authorized as tolerated. Physical therapy with passive assisted ROM was authorized on the second postoperative week. After four weeks, a conventional physical therapy protocol was initiated, with emphasis on analgesia, muscle strengthening, stretching, and sensory-motor training.

After 12 months, the patient reported improvement in pain; complete ROM and moderate quadriceps hypotrophy were observed. The magnetic resonance imaging evidenced repair tissue that filled the surface of the lesion with satisfactory bone integration and adequate leveling. No unstable fragments were detected (Fig. 4). The IKDC score improved from 62.7 to 74.7. The KOOS-pain improved from 83.3 to 94.4; KOOS-symptoms, from 60.7 to 85.7; KOOS-quality of life, from 56.2 to 81.2; finally, the KOOS-daily life activity was 100 points in the

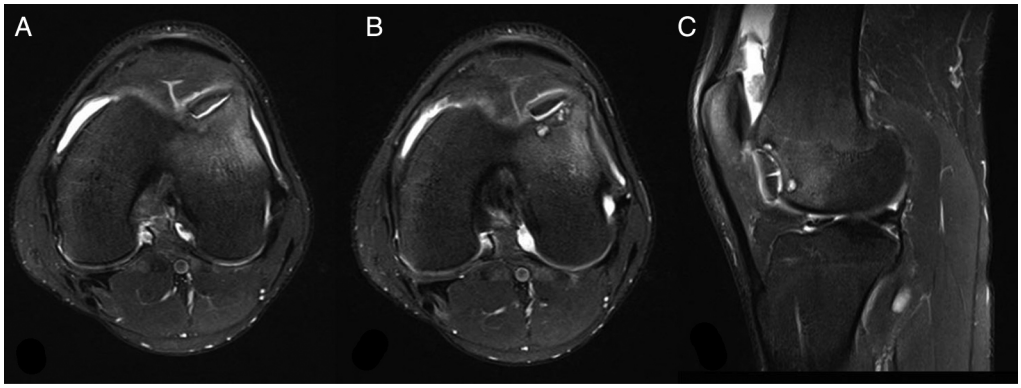

Fig. 1 – Preoperative magnetic resonance imaging. A and B, axial sections indicating unstable osteochondral lesion with subchondral bone cysts; C, sagittal section showing partial reabsorption and fragmentation of the subchondral bone of the osteochondral fragment.

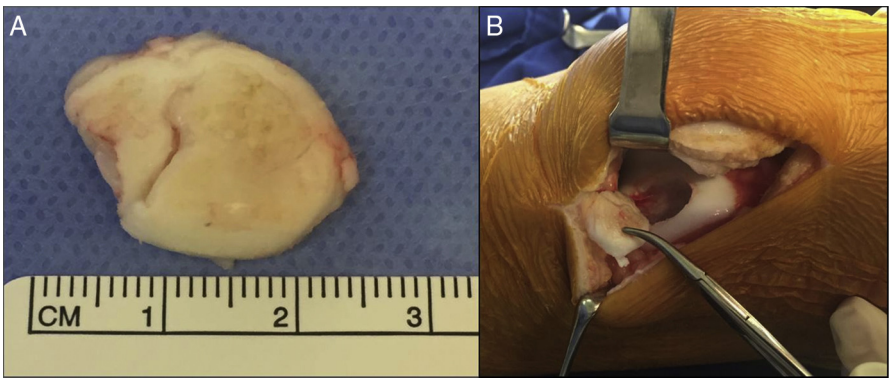

Fig. 2 – A and B, unstable and fragmented lesion with partial resorption of the subchondral bone.

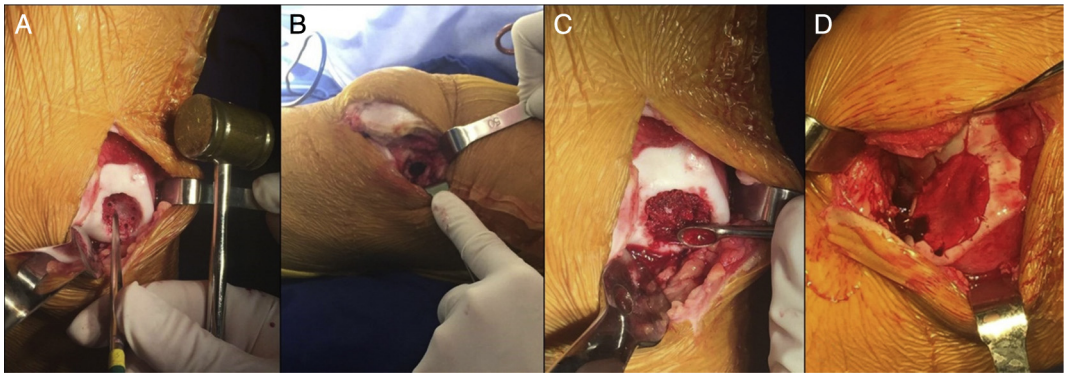

Fig. 3 – A, debridement of the edges of the lesion and microfracture; B, removal of the spongy bone graft from the lateral femoral metaphysis; C, impaction of the bone graft; D, final appearance after coverage and suturing with collagen membrane.

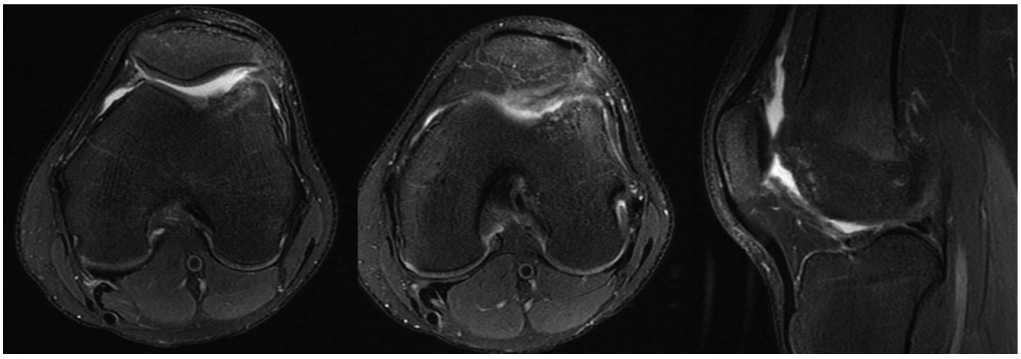

Fig. 4 – Post-operative magnetic resonance imaging showing bone graft integration, subchondral bone recovery, and early repair tissue formation at the joint surface.

pre- and postoperative periods. The KOOS-sports/recreation score worsened, from 95 to 85 points.

Discussion

The present case reported an osteochondral lesion with sequelae from a rare OD of the trochlea. Among the treatment options, mosaicplasty was considered to be inadequate due to the need to remove osteochondral cylinders from the medial trochlea, which could create additional lesion and compromise the entire trochlea. The literature demonstrates that fresh homologous osteochondral transplantation is an excellent treatment option in cases of extensive osteochondral lesions,[2,6] but the patient did not agree in participating in this institution's osteochondral transplantation program. Therefore, the authors decided on the microfracture technique, bone grafting, and collagen membrane coverage.

A randomized clinical trial compared the results of the AMIC® technique with those of simple microfracture for the treatment of small to medium chondral lesions in the knee (mean of 3.6 cm^2). A satisfactory improvement in clinical and

radiological outcomes was observed with both treatments up to two years of follow-up, and no differences were observed between groups.[8]

Recently, a five-year follow-up study demonstrated deterioration of clinical outcomes in patients who underwent isolated microfracture after two years of follow-up; those clinical outcomes remained stable in patients undergoing AMIC®.[6] The quality of the regenerated tissue was assessed by magnetic resonance imaging, and the superiority of AMIC® in filling the osteochondral defect was demonstrated. After two years of follow-up, chondral defect filling was more complete in the AMIC® group (60% of the patients had defect filling greater than two-thirds of the volume of the lesion) when compared with those who underwent microfracture (25%).[6]

To date, few studies have been published on the use of AMIC® with bone grafting for knee injuries. A case report presented the use of this treatment in an extensive chondral lesion of the medial femoral condyle (6 cm^2); one year after surgery, the patient reported reduction of pain and increase in quality of life.[9] A case series study on the use of AMIC® with bone grafting for chondral talar lesions presented good clinical results after two years of follow-up.[10]

In the present case report, the patient presented improvement in all scores except for the KOOS sport/recreation. The authors believe that this finding is associated with the moderate quadriceps hypotrophy and discontinuity of sports activities until the total recovery of trophism of the operated limb (doctors orders). The clinical and radiological results of this case were considered satisfactory.

Conflicts of interest

The authors declare no conflicts of interest.

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