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Original article

Clinical-radiographic correlation of the femoral insertion point of the graft in reconstruction of the medial patellofemoral ligament☆

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ABSTRACT

Objective: To analyze the radiographic positioning of the femoral tunnel and correlate this with the postoperative clinical results among patients undergoing reconstruction of the medial patellofemoral ligament (MPFL) alone.
Method: This was a retrospective study in which 30 knees of 26 patients with recurrent dislocation of the patella that underwent MPFL reconstruction were evaluated. The femoral insertion point of the graft and the postoperative clinical condition were analyzed and correlated using the Kujala and Lysholm scales.
Results: 22 knees presented a femoral tunnel in the anatomical area (group A) and 8 outside of this location (group B). In group A, the mean score on the Kujala scale was 89.68 points and on the Lysholm scale was 92.45 points. In group B, the mean score on the Kujala scale was 84.75 points and on the Lysholm scale was 92 points. The difference between the means was not significant on either of the two scales.
Conclusion: Correlation with the clinical results did not show any difference in relation to the positioning of the femoral insertion of the graft.

Correlação clínico-radiográfica do ponto de inserção femoral do enxerto na reconstrução do ligamento patelofemoral medial

Palavras-chave:
Luxação patelar
Ligamento patelar
Reconstrução

RESUMO

Objetivo: Analisar o posicionamento radiográfico do túnel femoral e correlacioná-lo com os resultados clínicos no pós-operatório em pacientes submetidos à reconstrução isolada do ligamento patelofemoral medial (LPFM).

☆ Work performed in the Knee Group of Belo Horizonte, Hospital Mater Dei, Belo Horizonte, Minas Gerais, Brazil.

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Método: Estudo retrospectivo, em que foram avaliados 30 joelhos de 26 pacientes com quadro de luxação recidivante da patela submetidos à reconstrução do LPFM, analisados e correlacionados o ponto de inserção femoral do enxerto e o quadro clínico pós-operatório pelas escalas de Kujala e Lysholm.

Resultados: Apresentaram túnel femoral na área anatômica (grupo A) 22 joelhos e oito fora desse local (grupo B). No grupo A, a pontuação média pela escala de Kujala foi de 89,68 e pela de Lysholm foi de 92,45. No grupo B, a pontuação média pela escala de Kujala foi de 84,75 e pela de Lysholm foi de 92. A diferença entre as médias não foi significativa nas duas escalas.

Conclusão: Não houve diferença de resultados clínicos correlacionados ao posicionamento da inserção femoral do enxerto.

Introduction

The medial patellofemoral ligament (MPFL) is a strip of retinacular tissue that connects the medial epicondyle of the femur to the medial border of the patella. Several studies have shown that the MPFL is the primary restrictor of lateral patellar displacement and the main agent responsible for avoiding patellar dislocation, thus contributing 50–80% of the medial containment.[1,2] According to Amis et al.,[3] the MPFL has mean tensile strength of 208 N, although, as demonstrated by Mountney et al.,[4] its limited capacity for stretching results in total rupture in cases of complete patellar dislocation.

In cases of recurrent dislocation of the patella, surgical treatment is indicated, given that anatomical reconstruction of the MPFL is essential for restoration of patellar stability.[3,5–7] Thus, several techniques for MPFL reconstruction have been developed, mostly with replacement of the torn ligament by a tendon graft.[8–10]

Several studies have identified the location of the MPFL[3,11,12] and it is believed that anatomical restoration is essential for reproducing the normal isometry and function of the ligament.[13,14] Bone and radiographic parameters may help the surgeon to adequately verify the positioning of the reconstructed ligament.

The femoral isometric point makes the greatest contribution towards the isometry of the MPFL and is the most important factor for success of the surgery. However, its reproduction is more difficult and more subject to failure.[3,15]

Nonetheless, there are few reports correlating the positioning of the femoral tunnel and the clinical condition after the reconstruction. Through a retrospective study on patients who underwent MPFL reconstruction, we aimed to analyze the positioning of the femoral tunnel, by means of radiographs, and to correlate this with the clinical results and functional scores.

Sample and method

Between January 2008 and February 2013, MPFL reconstruction was performed on 30 knees in 26 patients (9 men and 17 women) presenting a condition of recurrent dislocation of the patella. The patients' mean age at the time of the surgery was 25.8 years, with a range from 16 to 46 years. The right knee was affected in 13 cases, while the left knee was affected in 17. The minimum follow-up was seven months and the maximum was 62 months, with a mean of 24.3 months. A correlation was made between the femoral insertion point of the graft (assessed by means of simple radiography of the knee) and the postoperative clinical condition (assessed by means of the Kujala and Lysholm scales.

The inclusion criterion was that the patients selected needed to present objective patellofemoral instability. Patients with an open growth plate, patellofemoral arthrosis or alterations of the anterior tibial tuberosity-trochlear groove (ATT-TG) distance or patellar height that required additional procedures for distal patellar realignment were excluded from the study. Patients with associated lesions on the operated limb that might directly or indirectly influence the final result were also excluded.

Three surgeons (LFBPJ, MHFC and OPN) performed the reconstructions using grafts from the semitendinosus tendon. A transverse tunnel was constructed in the upper-middle third of the patella. The femoral tunnel location was determined by means of palpation of the anatomical marks between the tubercle of the adductors and the medial epicondyle (Nomura point)[15] or by means of fluoroscopy, at the intersection of a line tangential to the medial condyle and its perpendicular at the projection of the posterior cortical bone, i.e. the method of Schöttle et al.,[16] according to the surgeon's preference. The graft was fixed in the femoral tunnel using a rhombus metal screw or absorbable interference screw, with the knee flexed at 30–45 degrees.

Radiographs of the patella were produced in anteroposterior (AP), lateral and axial views before the operation and at the end of the follow-up. The radiographic method used for evaluating the positioning of the femoral tunnel was the one described in the sagittal plane by Schöttle et al.[16] A point 1 mm anterior to the posterior femoral cortical bone, 2.5 mm distal to the origin of the medial femoral condyle and proximal to the Blumensat line was determined as the femoral insertion of the MPFL (Fig. 1). An area of 5 mm in diameter was described. Two groups of patients (A and B) were defined, with their tunnels respectively inside and outside this predetermined