TREATMENT OF ACUTE PATELLOFEMORAL DISLOCATION THROUGH MEDIAL PATELLOFEMORAL LIGAMENT REPAIR

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SUMMARY

The authors evaluated the evolution of seventeen patients with acute patellofemoral dislocation. Patients were treated through medial patellar ligament suture. The suture of the ligament was performed by arthroscopy in nine patients with ligament lesion near to the patella. The other eight patients, with patellofemoral ligament lesion occurring near to the femoral epicondyle, were treated by reinsertion at the femoral epicondyle with anchors. The patients had a mean follow-up period of forty months and there was no femoropatellar dislocation recurrence.

Keywords: Patellar dislocation; Knee; Knee joint.

INTRODUCTION

The acute dislocation of the patellofemoral joint is an infrequent event, occurring as a consequence of trauma resulting from an association of rotational movements with variable degrees of knee flexion.

Clinical history with trauma report, the painful missed step and hemarthrosis are common to most of acute knee injuries, in which clinical examination is difficult due to the presence of pain and muscle spasm precluding an adequate joint motion, which would enable an accurate clinical diagnosis.

Hughston et al.[1], reported that the acute patellofemoral dislocation is the most frequent cause of diagnostic error on the acute knee evaluation. The authors mention the high incidence of patellar dislocation that is not diagnosed in young male athletes.

Predisposing factors such as valgus knee, femoral trochlea dysplasias, unbalances of the extensor apparatus from various etiologies favor the occurrence of acute patellofemoral dislocation[2].

Treatment is still controversial in literature; the immediate reconstruction, or the conservative treatment are discussed behaviors. From the 1990s on, some authors[3,4,5] reported their results on treating acute patellar dislocation by repairing the medial patellofemoral ligament (MPFL), described by Warren and Marshall[6]. The understanding of this ligament's anatomy and biomechanics and its repair have occasioned better and smoother outcomes to the surgical treatment of the acute patellar dislocation. The objective of this paper is to study the incidence of dislocation recurrence after the prompt repair of the medial patellofemoral ligament, as a single procedure on acute patellofemoral dislocations.

MATERIALS AND METHODS

The material was constituted by 17 patients who had suffered the first episode of acute patellofemoral dislocation. Nuclear magnetic resonance (NMR) was performed in all patients for diagnosing the extension of injuries caused by dislocation and to study the conditions predisposing dislocation (Table 1).

Patients' average age was 24.6 years old, with the 10-20 year-old age group being mostly affected, accounting for 9 cases.

The left side was affected in 9 patients. Eleven patients were females.

NAME	GENDER	AGE	SIDE	FT(MONTHS)
1	F	15	R	16
2	F	14	L	38
3	M	24	L	60
4	F	16	R	60
5	F	9	L	28
6	F	52	L	60
7	F	52	R	38
8	F	14	L	34
9	F	16	R	60
10	M	17	R	32
11	F	36	L	38
12	M	33	L	28
13	M	19	R	26
14	F	17	R	60
15	M	16	L	34
16	F	43	R	60
17	M	26	L	16

Abbreviations: M-male; F-female; R-right; L-left

***Table 1** - Distribution of patients with acute patellofemoral dislocation, according to: name, gender, age, dislocation side, and follow-up time (FT).*

Once the diagnostic was is confirmed and injury extension is proven by NMR, patients were recommended for medial patellofemoral ligament (MPFL) repair. All patients were operated within 1 month after the occurrence of the trauma that determined dislocation.

In order to assess the occurrence or the lack of occurrence of predisposing factors, we used two criteria:

1 – clinical criterion: we asked patients about the occurrence of symptoms suggesting patellofemoral instability, such as missing steps and complaints about deceleration.

2 – radiological criterion: we analyzed femoral trochlea depth and patellar height, according to Insall Salvatti's method[7].

We considered patients with predisposing factors as those presenting either the clinical criterion or any of used radiographic criteria. Nine patients have been considered as having predisposing factors.

The NMR allowed for injury and patellar structural changes diagnostic (Figure 1) and femoral condyles diagnostic. In five cases,

Study conducted by the Department of Orthopaedics and Traumatology, Medical College, University of São Paulo – DOT-FMUSP, and by the Camanho Orthopaedic Institute.

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fracture occurred as a result of the patellar medial border removal and, in other nine cases, of the chondral lesion of the lateral femoral condyle.

Nine patients presented with MPFL injury near to the patella, and in three of them the injury presented a diffuse pattern. Eight patients had injury at the femoral insertion of the MPFL, and, in three of them, the injury presented a diffuse pattern. Thus, six patients presented with a diffuse injury of the MPFL, although clearly preferably located near to the patella or near the femur.

All patients were submitted to knee arthroscopy which enabled the observation of six cases of patellar osteochondral fracture, compromising the subchondral bone, not clearly seen through NMR.

Injuries near to the patella were sutured through arthroscopic means according to the technique described[8] (Scheme 1). Femoral injuries were reinserted with anchors placed at the femoral epicondyle (Figure 2). After ligament healing, patients were maintained in removable braces for 3 weeks. They were assessed in a twice a week basis, and by the time the evaluation was performed, flexion-extension was repeatedly performed in a passive way by the orthopaedist. Rehabilitation program was initiated on the fourth week and was concluded when patients were rehabilitated to the activity preceding patellofemoral dislocation. The average rehabilitation time was 104 days.

Follow-up time was limited to 60 months and an average follow-up time of 40.4 months was achieved in the studied material. During that period, patients were examined at least at each six months, when knees status were evaluated and dislocation recurrence rates were asked about.

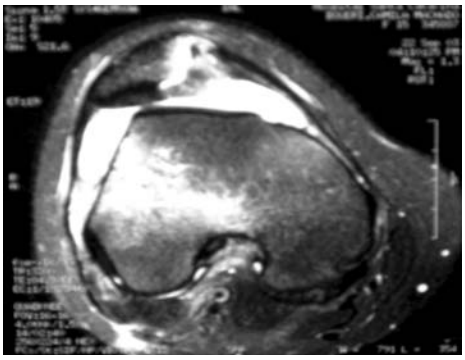
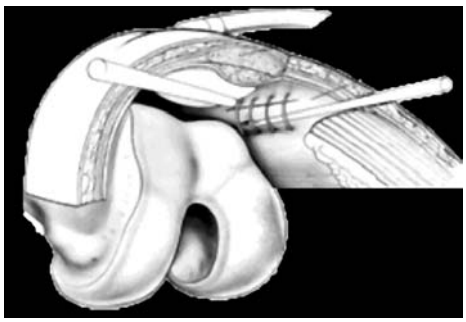


***Figure 1** - nuclear magnetic resonance image showing an injured mpfl in its patellar insertion.*



***Scheme 1** - percutaneous suture of the medial capsule lesion with arthroscopic control.*

***Figure 2** - knee radiograph in frontal plane showing inserted anchor. at the medial epicondyle for mpfl insertion.*

RESULTS

Patients were evaluated for an average period of time of 40.4 months, being 18 months the shorter evaluation time, in two cases, and 60 months the longest evaluation time. For the purposes of this study, only recurrence cases were evaluated and no patient presented recurrence during the evaluation period.

Two patients presented with instability symptoms, which were interpreted as sub-dislocations during rehabilitation period.

Within an average time of 104 days, patients resumed their usual activities. No complications were found in this series.

DISCUSSION

Conservative treatment of acute patellofemoral dislocation leads to a high recurrence percentage. According to Maenpaa et al.[9], 44% of the patients with acute patellofemoral dislocation presented dislocation recurrence when conservative treatment was given; Cofield and Bryan[10] reported that 50% of the patients had dislocation recurrence with the same kind of treatment, as well. Although still controversial, there are classic studies addressing surgical treatment with better outcomes.

Smillie and De Palma *apud* Boring and O'Donoghue[11] suggest the suture of knee medial capsule as the best treatment for acute patellar dislocation.

Boring and O'Donoghue[11] reported their experience with the surgical treatment of acute patellofemoral dislocation in 17 patients. In nine patients, medial capsule repair was associated to patellar tendon medialization, and, in the others, only medial capsule repair was performed. In all 17 cases, there was no dislocation recurrence.

Cash and Hughston[12] published a classic study where 399 patients with acute patellofemoral dislocation were studied; although demonstrating a percentage of 50% - 70% of good outcomes with conservative treatment, they reported no recurrences in patients surgically treated through medial capsule repair.

In anatomical and biomechanical studies[3,13,14] of the MPFL there was a clear trend by authors to treat acute patellofemoral dislocations by repairing the MPFL. Sallay et al.[17], Boden et al.[16], Ahmad et al.[15] presented their series with MPFL repair with no reports of dislocation recurrences.

Our material presents similar characteristics to those of the authors studying acute patellar dislocation, such as Atkin et al.[18] , except for three young ladies with advanced ages compared to the average. The specific analysis of those patients showed that all of them dislocated their patellas in clearly traumatic episodes during sports practice.

More than half of the patients presented predisposing factors to dislocation. Some authors, like Hughston et al.[1], believe that there is no dislocation without a predisposing factor; however, Ahmad et al.[15] considered that predisposing factors to dislocation are not so important. We believe that the presence of valgus, trochlear dysplasias described by Dejour and co-authors[19] and the patella have a strong influence on the occurrence of acute patellar dislocation, however, half of our patients had no clinical or radiographic sign that could be regarded as a predisposing factor.

The simultaneous correction of predisposing factors associated to the reconstruction of the MPFL was not performed in any case, as suggested by Arendt et al.[20].

The majority of the authors[17] describe the acute injury of the MPFL at the femoral epicondyle as much more frequent; in our series, lesions occurred at the patella in half of the cases and at the femoral condyle in the other half.

We believe that the association of NMR and arthroscopic analysis of the injury in our cases allowed for a more frequent diagnostic of injuries near to the patella.

The occurrence of diffuse ligamentous injuries in one third of the cases suggested that we should reconstruct the MPFL with some kind of graft; nevertheless, in this series, we performed no reconstruction and we had no recurrences in this group of six patients. Two patients presented sub-dislocation during rehabilitation period. These two patients were followed-up for more than 40 months and they didn't have any other instability complaints.

There was no dislocation recurrence in all our patients. The same report on outcomes was made by authors of classic studies, such as Cash and Hughston[12], Boring and O'Donoghue[11] when mentioning the cases in which acute patellofemoral dislocation was surgically treated.

Authors such as Ahmad et al.[15], Sallay et al.[17], Boden et al.[16] who studied the results of isolated repair of the MPFL on the treatment of acute patellofemoral dislocation also did not report cases with dislocation recurrence.

CONCLUSION

The repair of the medial patellofemoral ligament was shown to be an effective technique on the treatment of acute patellofemoral dislocation, preventing dislocation recurrence.

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