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Case Report

Patellar Instability: About Operated Two Cases

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Abstract

Patellar instability is a common clinical problem, the etiology is multifactorial and a clear understanding of the cause of instability is crucial for appropriate surgical treatment. With the present study, we report two cases treated in our department, for objective patellar instability, and we take an approach to this condition, to demonstrate through the results the importance of precise radiological analysis in the choice of a surgical strategy, associating bone and other gestures on the soft parts, while taking into account the age of the patients and the degree of dysfunction. The prognosis is dominated by the onset of patellofemoral arthritis at an early age.

Keywords: *Knee; MPFL; Osteoarthritis; Patellofemoral*

Introduction

Patellar instability is a rare and uncommon pathology affecting adolescent and young adult, with a female predominance [1], it is a consequence of multiple factors including bone, ligament and muscular disorder. Recurrent patellar instability can result from a trauma or non-trauma mechanism [2].

Our study aims at drawing attention to the importance of a precise radiological analysis in the choice of a surgical strategy, associating bone and other gestures on the soft parts, while taking into account the age of the patients and the degree of the dysfunction.

Clinical Cases

We report two cases of patellar instability, the first one was a 20-year-old man who suffered 4 years ago from lateral dislocation of the right patella, reduced in emergency and immobilized for 1 month. The evolution was marked by the occurrence of recurrences (6 times), which became disabling. The second patient was a 19-year-old man also victim two years ago of lateral dislocation of his right patella reduced itself and suffering since that time of patellar instability.

Clinical examination had objectified unilateral amyotrophy of the quadriceps, patellar shock and positive Smiley's sign and apprehension, with frontal hypermobility of the patella and patellar subluxation (Figure 1).

Plain radiographs of both patients noted patellar divergence, patella alta with increasing Caton-Deschamps ratio of more than 1.2 mm, and "crossing sign" indicating trochlear dysplasia type A of Dejour's classification. CT-scan confirmed dysplastic trochlea and increasing TA-GT distance of 18,4 mm in extension and 13 mm in flexion for first patient, and TA-GT distance of 23 mm in extension, 14 mm in flexion concerning the second patient (Figure 2).

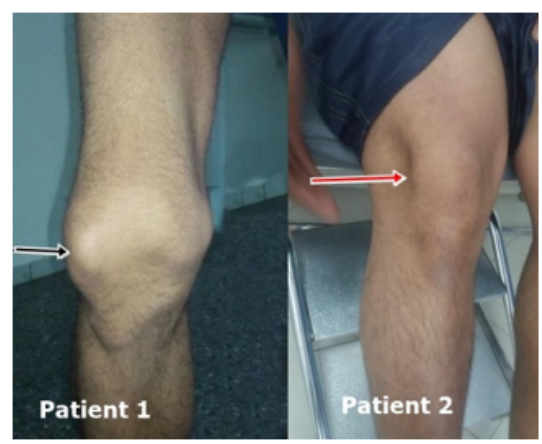

Figure 1: *Patellar instability from 0° to 30° of knee flexion with patellar dislocation in first patient (black arrow) and subluxation in second patient (red arrow).*

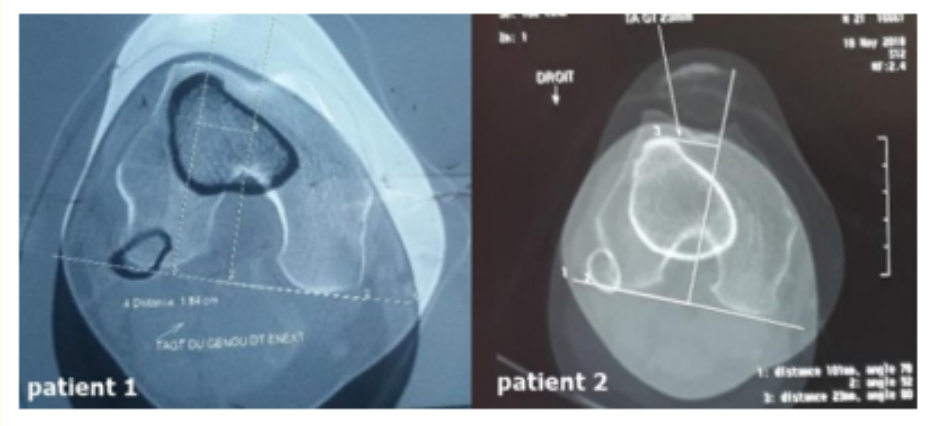

Figure 2: *CT-scan images showing increasing TA-GT distance of both patients.*

For both patients surgical treatment was decided after failure of nonoperative treatment during one year, including tibial tuberosity osteotomy (TTO) medializing and distalizing tibial tubercle to correct associated patella alta, followed by knee immobilization during about 6 weeks, during this period patient keeps the splint day and night and removes it during rehabilitation sessions performed 5 times a week, taking great care to avoid stand up without splinting at different exercise changes. After these first 45 days the splint can be permanently removed, under the guise of obtaining successfully and sufficient quadriceps locking during the previous phase.

Results

With a follow-up surpassing 12 months, patients are satisfied with a stable and painless patella, no case had presented an episode of patellar instability (dislocation or subluxation) and free return to daily and sport activities.

On the subjective level, there is disappearance of pain and apprehension, better patella centering and functioning of the knee extensor system allowing the relief of patellofemoral constraints. Objectively, there had been no iatrogenic postoperative low patella. Consolidation of the TTO were obtained within the usual time frame. Our results can be considered, given activities level of our patients, as excellent (Figure 3).

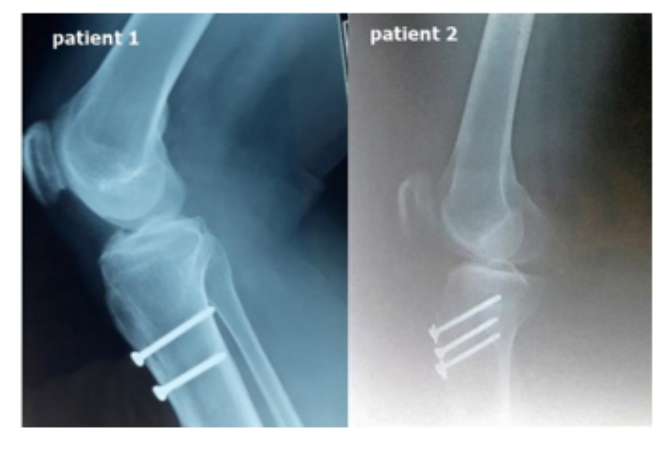

Figure 3: *Post-operative X-rays showing tibial tubercle osteotomy fixed by cortical screws (profile incidences).*

Discussion

Patellofemoral instability is a complex pathology of the knee extensor system where the patella is disposed to recurrent lateral dislocation. It is most often multifactorial with three main components: osteoarticular disorder, ligament laxity and muscle deficit. Three major morphologic abnormalities which predispose to patellar instability are trochlear dysplasia, patella alta and lateralization of the tibial tuberosity [3].

Most patients with patellar instability are young and active patients, especially females in the second decade. Literature reports 30% of bilaterality in objective patellar instabilities, nevertheless our two patients are mane and have unilateral disorder [4]. Patellar instability diagnosis should always be made with a precised history of documented first dislocation episode and type of reduction performed as like in our two cases, or pathognomonic signs on MRI or CT scan if they were realized after this first episode such as contusions of the medial patella facet and external femoral condyle. Isolated clinical apprehension is not sufficient to make the diagnosis, which in occasional cases might point to subluxation or a sensation of multidirectional instability only.

Plain radiography (antero-posterior, profile and patellofemoral incidences), allow for an informed eye, a diagnosis of certainty in the majority of cases when it is a question of a dislocation followed by disorder, it also allows a fairly precise approach of anatomical factors responsible for the disorders. We can note patellar divergence, higher Caton-Deschamps ratio of more than 1.2 mm indicating patella alta, with "crossing" sign, where the curve of the trochlear floor crosses the anterior contour of the lateral femoral condyle [5].

AGA patellofemoral committee has defined guidelines to correct mechanical risk factors for this disorder, thus, patellar instability from 0° to 30° of knee flexion is generally caused by insufficient passive stabilizer, isolated MPFL reconstruction might be sufficient whereas patellar instability up to 60° of knee flexion implicate insufficient passive stabilizers and static stabilizers, requiring concomitant MPFL reconstruction and realignment of the extensor system or trochleoplasty. Finally, instability up to 90° is due to insufficient passive and

static stabilizers and potential misalignment. This form is the most complex and might require a combination of MPFL reconstruction, trochleoplasty and/or tibial tubercle alignment [10]. We believe that CT-scan is imperative preoperatively, for a positive diagnosis of patellofemoral instability and therapeutic decision by showing either a dysplastic trochlea, increasing TA-GT distance and patellar tendon length (> 55 mm) [6].

Surgical treatment can be recommended after failure of nonoperative treatment, when history and physical examination findings are clearly consistent with diagnosis of patellar instabilities, it is intended for all symptomatic patients with multiple dislocation episodes particularly in young active patients with increased patella instability severity score (PISS) equal to or exceeding 4 points (Table 1). More than 100 surgical procedures have been described for this complex disorder and are most often used in combination. Among these, numerous ligamentoplasty techniques have been proposed principally medial patellofemoral ligament (MPFL) reconstruction that must be practiced in the absence of anatomical abnormality such as patella alta or major trochlear dysplasia, generally the first episode of patellar dislocation in this category occur after a high impact or high energy trauma followed by recurrent dislocations [7]. Furthermore, although being a most practiced ligamentoplasty, there is no current, consensus on the points of isometry and the tension to be applied to this reconstruction. This resulted in frequent failures due to anisometry or excess tension of the reconstruction, postoperative pain especially in higher knee flexion, and early internal patellofemoral osteoarthritis. Moreover, lateral retinacular release (FICAT intervention) is a gesture constantly practiced, but it is unanimously recognized that if this procedure is practiced lonely is unable to treat a patellar instability, the observed rates of recurrence can go up to 40%. This gesture must be associated with TTO in all patients when there is excessive patellar tilt above 20° [8].

TTO technique shows satisfactory functional outcomes with low complication rate and allowing early rehabilitation, tibial tubercle can be medialized to correct increased TA-GT distance and distalized to correct associated patella alta, however, TTO adjustment remains imprecise and depends a lot on the experience of the operator. Tibial shaft fracture is rare complication most often observed in high active mal patients. A recent randomized control trial has shown higher satisfaction and improved alignment in patients with TTO associated with MPFL reconstruction, in comparison of patients with Transposition alone [9]. This osteotomy requires often another operation for hardware removal.

Trochleoplasty procedure aim to reconstruct trochlear surface, a sulcus deepening or flattening trochleoplasty are used by performing an osteochondral flap. Indication for this procedure is controversial, the AGA patellofemoral committee suggested that trochleoplasty should be considered if patellar instability exceeds 30° of flexion, and for high degree of trochlear dysplasia [10]. It is technically highly challenging procedure with no evidence of improved functional outcome or delayed osteoarthritic progression [11]. Other bony procedure such as distal femoral osteotomy must be considered in excessive knee valgus of more than 8° or femoral antetorsion of more than 30°, It is usually combined with MPFL reconstruction [12].

Patellar instability must be assessed carefully to propose adequate treatment and avoid possible complications. Return to sport is slightly improved after surgery compared to conservative treatment.

Conclusion

Patellar instability is an uncommon pathology frequent in young patient. CT scan is the key element in the diagnosis and surgical indication. Early patellofemoral osteoarthritis is the last issue if non treated or treated conservatively.

Conflict of Interest

Nothing to report.

Consent

Obtained.

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