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Case report

Patellar lateral closing-wedge osteotomy in habitual patellar dislocation with severe dysplasia

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ABSTRACT

The "à la carte" surgical strategy for treating patellar instability developed in Lyon, France, is well known. The corrective procedures are planned based on a preoperative analysis of the morphological abnormalities. Among factors responsible for patellofemoral incongruity, patellar dysplasia is among the most challenging to correct. We report a case of habitual patellar dislocation with severe patellar dysplasia that required a complex surgical strategy including patellar lateral closing-wedge osteotomy to improve patellofemoral congruity. This treatment was effective in ensuring stability and function. This complementary technical procedure can be useful in some patients with major patellofemoral instability.

1. Introduction

The surgical management of objective patellar instability requires an "à la carte" strategy. The surgeon selects various corrective procedures based on a preoperative clinical and radiological analysis of the morphological abnormalities [1–6]. Habitual or permanent patellar dislocation often starts in childhood and constitutes the most severe form of patellar instability. When the knee is flexed, the patella is completely and permanently dislocated. Pain is also a feature in patients with concomitant cartilage damage. In this situation, marked patellofemoral incongruity is combined with severe femoral and patellar dysplasia. Although patelloplasty and patellar osteotomy are only very rarely indicated, they are useful techniques that deserve to be known. They seek to improve patellofemoral congruity and to delay progression to early osteoarthritis. At present, two main patelloplasty techniques are available. Saragaglia et al. [7] recently described a medial facet patelloplasty technique involving resection of the medial and distal patellar bulge. Morscher [8,9] developed a procedure consisting in anterior closing-wedge sagittal osteotomy of the patella.

Here, we report an original patellar lateral closing-wedge osteotomy that can be performed in patients with a concave patella. This technique is effective in restoring an appropriate patellar shape. It is designed to be used as a component of an "à la carte" surgical strategy for severe patellofemoral dysplasia.

2. Case-report

A 29-year-old female presented with habitual dislocation of the right patella. She had no sporting activities. At 12 years of age, she had had surgery for habitual patellar dislocation, using a soft tissue technique. She again had habitual patellar dislocation, at only 90° of knee flexion, with chronic incapacitating anterior mechanical knee pain (subjective IKDC score of 44/100 and Kujala score of 53/100).

Clinically, the patella could not be repositioned when the knee was in more than 90° of flexion. Motion ranges were normal and symmetrical (130° of flexion without flexion contracture) (Video 1).

The radiographs (Fig. 1) and computed tomography images (Fig. 2) showed lateral subluxation of the patella (distance from the tibial tubercle to the trochlear groove [TT-TG distance], 24 mm; patellar tilt, 18°), patella baja (Caton and Deschamps index, 0.7), type D trochlear dysplasia, and a concave patella with a preoperative trochlear angle of 225° (normal, 140°) (Wiberg 2 [10]).

The surgical treatment consisted in four procedures:

- the anterior tibial tubercle was displaced medially and proximally, and the lateral retinaculum was released, given the patella baja;
- the trochlear groove was deepened (trochleoplasty);
- a vastus medialis plasty according to Insall was performed;
- the abnormal concavity of the patella was corrected by performing a lateral patellar osteotomy. On a preoperative 100% radiograph, we determined the size of the lateral wedge to be resected (Fig. 2). The goal was to obtain a trochlear angle of 140°. Via the lateral approach, a lateral patellar osteotomy was

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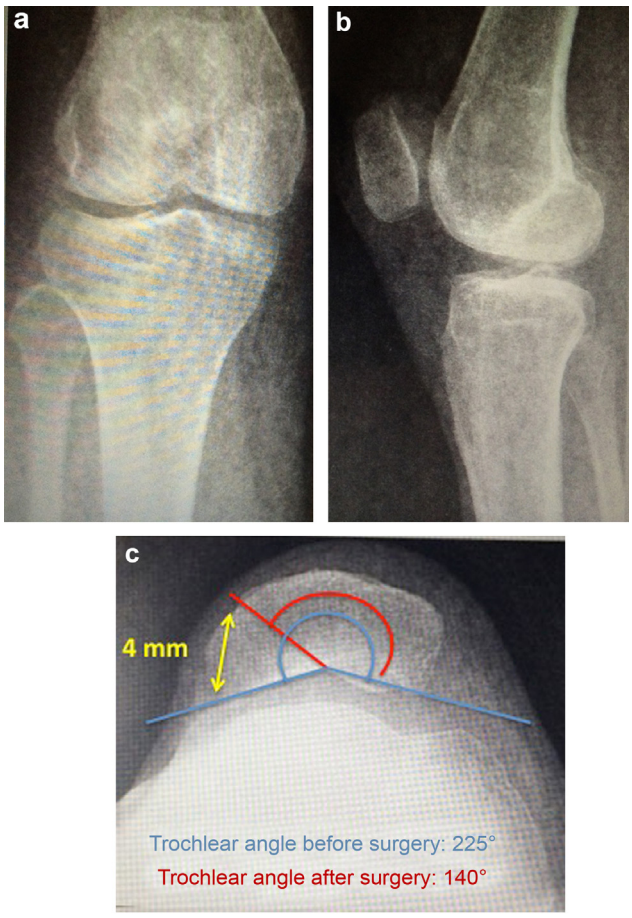

Fig. 1. Preoperative radiographs: a: anteroposterior view; b: lateral view; c: axial view with the planned correction of the trochlear and patellar angle.

performed using an oscillating saw guided by two pins, to remove a 4-mm lateral wedge extending down to the cartilage, which was left intact (Fig. 3). After closure of the approach, fixation was achieved using two non-absorbable trans-osseous sutures.

The patella was then stable and well centered until 120° of knee flexion, and consequently, the medial patellofemoral ligament was not reconstructed.

Ambulation with protected weight-bearing and a knee splint was started immediately. Knee flexion was restricted to 80° for 45 days.

At 1 year follow-up, the patient reported no pain at rest or during activities. She had 120° of active and passive knee flexion, with

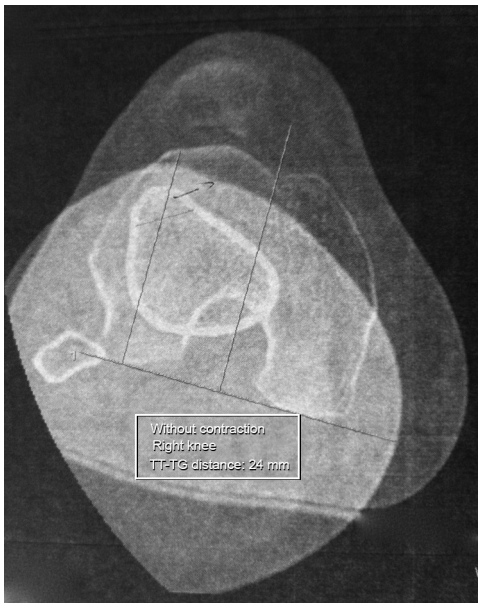

Fig. 2. Computed tomography, axial slice: determination of the TT-TG distance.

no flexion contracture. Her patella was stable. The imaging studies showed healing of the osteotomies and a well-centered extensor mechanism (Fig. 4). The postoperative patellar angle was 140°. The patient was satisfied. Her functional IKDC score was 92 compared to 44 preoperatively and her Kujala score was 94/100 compared to 53/100 preoperatively.

3. Discussion

The objective of this case-report is to describe an original technique of lateral patellar osteotomy used in a patient with a concave patella. This technique should be used as one component of an "à la carte" surgical strategy [11–17] for habitual patellar instability, with the goal of restoring patellofemoral congruity and extensor mechanism alignment. The four main factors that are usually considered are trochlear dysplasia, patella alta, extensor mechanism malalignment (evaluated based on the TT-TG distance), and excessive patellar tilt. Conventional surgical strategies seek to correct these factors by combining several procedures [4]. However, patellar dysplasia is another contributor to patellofemoral incongruity that should be given appropriate attention, although surgery on the patella is rarely indicated.

Two "patellar techniques" have been described, but both are associated with high complication rates. The most widely known is the anterior closing-wedge sagittal osteotomy developed by

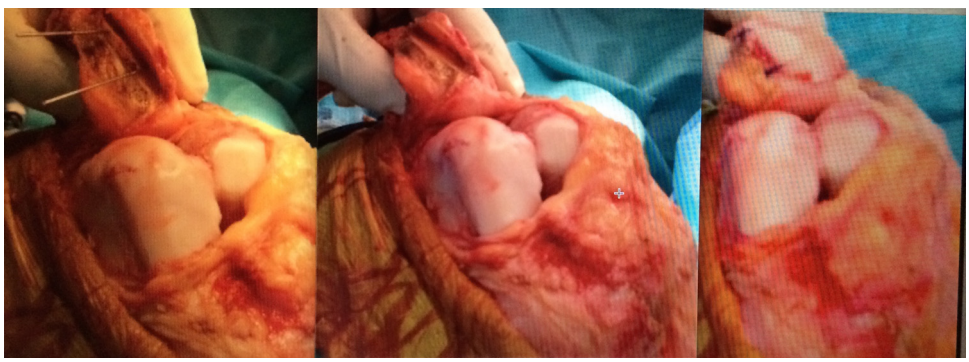

Fig. 3. Lateral patellar osteotomy guided by pins and fixed by transosseous sutures. Left panel: position of the pins used to guide the bone cuts; middle panel: bony defect after removal of the wedge and before suturing; right panel: closure of the defect and fixation by transosseous suturing (correction of the dysplasia).