Patellar fracture following combined proximal and distal patella realignment

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The authors present a case of a proximal avulsion fracture of the patella two months after a combined proximal and distal realignment operation. Vascularisation of the patella due to the combined technique was considered the main pathogenic factor. Treatment with open reduction and transosseous fixation was successful.

Keywords: patella fracture; proximal realignment; Fullkerson osteotomy.

Proximal and distal realignment procedures have both been proposed for treatment of recurrent dislocation of the patella (1, 2, 4, 5). Accepted techniques include lateral retinacular release, medial capsulolophy and the Roux-Goldthwait procedure (1,2,4,5). When the patellofemoral joint is malaligned with an increased Q-angle, an osteotomy of the tibial tuberosity, such as an Elmslie-Trillat procedure or Fullkerson osteotomy is preferable (1,2,4,5). Fractures of the proximal tibia have however been reported following osteotomy of the tuberosity (1,11).

The authors report a case of a proximal patella fracture after a realignment procedure combining lateral reticular release, medial capsuloraphy and a Fullkerson osteotomy.

CASE REPORT

A 20-year-old male patient was seen at our clinic with a history of recurrent patellar dislocations over the past six years. His first three patella dislocations required reduction under general anaesthesia, but he was able to relocate himself the patella after the last two dislocations. He also complained of anterior knee pain when going up and down stairs and while sitting with the knee flexed for a long time.

On clinical examination an increased Q-angle was noted, and lateral patellar subluxation was observed on quadriceps contraction. There was a full range of motion and a normal tibiofemoral stability. There was no obvious quadriceps atrophy.

Radiographs showed a lateral subluxation of the patella and a CT-scan confirmed a lateral position of the tuberosity.

Under spinal anaesthesia and with a tourniquet inflated at the thigh, a combined proximal and distal realignment procedure was performed. An open lateral release was performed without preserving the lateral genicular arteries, in combination with a medial capsulorraphy procedure according to

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Insall (7). With this technique the medial patellotibial ligament is also released, sacrificing both medial genicular arteries. Additionally a Fullerson osteotomy with correction of the Q-angle was performed (4). The osteotomy site was rigidly fixed with two compression screws. Excellent patellar tracking and stability was achieved. A standard postoperative protocol was followed with bracing, continuous passive motion, partial weight bearing and isometric quadriceps exercises. At six weeks follow-up, an excellent evolution was observed.

However two months postoperatively the patient slipped with acute hyperflexion of his operated knee. He presented at the emergency room with haemarthrosis, extension lag and a palpable defect in the proximal extensor mechanism. The standard radiograph demonstrated a proximal patellar fracture. Internal fixation was proposed to the patient. The proximal patellar fragment was exposed through the previous lateral release. On exploration the vastus medialis obliquus was still attached to the upper medial quadrant of the patella. A small portion of the articular cartilage was attached to the proximal fragment (sleeve fracture). The fragment was transosseously reattached with a good restoration of the articular surface. At twelve months postoperatively, a normal range of motion was restored without an extensor lag.

**DISCUSSION**

Patellar dislocations are adequately treated conservatively (3,5,7). Bracing, anti-inflammatory medication and quadriceps tonification are the principal measures (5). In primary traumatic cases the insertion of the medial patellofemoral ligament can be repaired (8). In recurrent cases with obvious maltracking, a realignment procedure is preferable (5,10). A proximal soft tissue procedure is advised in young children with open physes or as a complementary ‘fine tuning’ to a distal bony procedure (4,7,10). If lateral subluxation of the tuberosity is combined with patellar chondromalacia a Fullerson osteotomy is indicated (4,5). Anteromedialisation of the tubercle will correct the increased Q-angle and centre the patella in the
trochlea, and will also decompress the articular cartilage (4,5). Combination of the action on the proximal soft tissue and the osteotomy of the tuberosity will compromise the vascularisation of the patella. Genicular arteries are compromised by both medial and lateral arthroscopy and the combined osteotomy will further reduce the intrinsic vascularisation of the patellar tendon and Hoffa’s fat pad (6,9). Furthermore, due to the medial soft tissue imbrication, the force distribution of the quadriceps is altered (7,10). As a result the proximal patella pole is prone to avulsion fractures as described in this case.

The authors propose a careful dissection with preservation of one or more of the genicular arteries in combined procedures to limit the risk of avascular necrosis, whose effects add to the postoperative disuse osteoporosis of the patella.

REFERENCES


Fig. 3. — Patella alignment after combined procedure