



## Patellar fracture following combined proximal and distal patella realignment

Emmanuel THIENPONT, Vincent DRUEZ

*From Cliniques Universitaires Saint Luc, Brussels, Belgium*

**The authors present a case of a proximal avulsion fracture of the patella two months after a combined proximal and distal realignment operation.**

**Devascularisation 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 ; Fulkerson 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 capsulorrhaphy 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 Fulkerson 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 capsulorrhaphy and a Fulkerson 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 capsulorrhaphy procedure according to

---

■ Emmanuel Thienpont, MD, Orthopedic Surgeon.

■ Vincent Druetz, MD, Orthopedic Surgeon.

*Department of Orthopaedic Surgery, Cliniques Universitaires Saint Luc, Brussels, Belgium.*

Correspondence : Emmanuel Thienpont, Saint Luc University Hospital, Avenue Hippocrate 10, 1200 Woluwe, Belgium.

E-mail : ethienpont@yahoo.com.

© 2007, Acta Orthopædica Belgica.

---



Fig. 1. — Proximal patella avulsion fracture



Fig. 2. — Patella after transosseous fixation

Insall (7). With this technique the medial patellotibial ligament is also released, sacrificing both medial genicular arteries. Additionally a Fulkerson 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 Fulkerson osteotomy is indicated (4,5). Antero-medialisation of the tubercle will correct the increased Q-angle and centre the patella in the

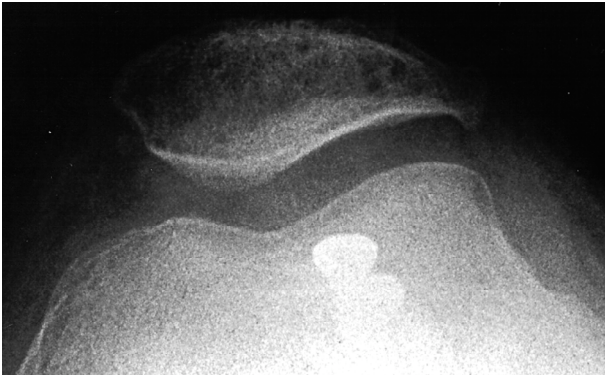


Fig. 3. — Patella alignment after combined procedure

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 arthrotomies 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 post-operative disuse osteoporosis of the patella.

## REFERENCES

1. **Bellemans J, Cauwenberghs F, Brys P, Victor J, Fabry G.** Fracture of the proximal tibia after Fulkerson anteromedial tibial tubercle transfer. A report of four cases. *Am J Sports Med* 1998 ; 26 : 300-302.
2. **Chrisman OD, Snook GA, Wilson TC.** A long-term prospective study of the Hauser and Roux-Goldthwait procedures for recurrent patellar dislocation. *Clin Orthop* 1979 ; 144 : 27-30.
3. **Crosby EB, Insall J.** Recurrent dislocation of the patella. *J Bone Joint Surg* 1976 ; 58-A : 9-13.
4. **Fulkerson JP.** Anteromedialization of the tibial tuberosity for patellofemoral malalignment. *Clin Orthop* 1983 ; 177 : 176-181.
5. **Fulkerson JP, Schutzer SF.** After failure of conservative treatment for painful patellofemoral malalignment : lateral release or realignment ? *Orthop Clin North Am* 1986 ; 17 : 283-288.
6. **Hughes SS, Cammarata A, Steinmann SP, Pelligrini VD.** Effect of standard total knee arthroplasty surgical dissection on human blood flow in vivo : an investigation using laser Doppler flowmetry. *J South Orthop Assoc* 1998 ; 7 : 198-204.
7. **Insall J, Bullough PG, Burstein AH.** Proximal tube realignment of the patella for chondromalacia patellae. *Clin Orthop* 1979 ; 144 : 63-69.
8. **Mikashima Y, Kimura M, Kobayashi Y, Miyawaki M, Tomatsu T.** Clinical results of isolated reconstruction of the medial patellofemoral ligament for recurrent dislocation and subluxation of the patella. *Acta Orthop Belg* 2006 ; 72 : 65-71.
9. **Scuderi G, Scharf SC, Meltzer LP, Scott WN.** The relationship of lateral releases to patella viability in total knee arthroplasty. *J Arthroplasty* 1987 ; 2 : 209-214.
10. **Scuderi G, Cuomo F, Scott WN.** Lateral release and proximal realignment for patellar subluxation and dislocation. *J Bone Joint Surg* 1988 ; 70-A : 856-861.
11. **Stetson WB, Friedman MJ, Fulkerson JP, Cheng M, Buuck D.** Fracture of the proximal tibia with immediate weightbearing after a Fulkerson osteotomy. *Am J Sports Med* 1997 ; 25 : 570-574.