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Patella Infera

Patella infera with a Caton-Deschamps (C-D) index of 0.6–0.8 is not uncommon. If symptomatic, a proximal transfer of the tibial tubercle (TT) can be considered.

Patella infera (C-D index <0.6) occurs following surgery or trauma secondary to reflex sympathetic dystrophy (complex regional pain syndrome). It presents with pain out of proportion to the initial injury. An early diagnosis is critical to obtaining an outcome, and its occurrence should be suspected in patients who are slow to rehabilitate, who have reduced mobility of the patella, and whose quadriceps fire late. Patients typically complain of a burning prepatellar pain, a “vice”-like sensation, or subpatellar tightness. Descending stairs, prolonged sitting, and rising to stand increase the pain. Flexion is also limited. Osteopenia of the patella is seen on radiographs

(Fig. 37.1), and patella infera occurs secondary to contracture of the patellar tendon/retinaculum and quadriceps hypotonia. The axial view may reveal the classical “sunset” (Fig. 37.2). If diagnosed early, it can be treated by bracing the knee in 30° of flexion to put the patellar tendon under tension and rehabilitation with active quadriceps contractions.

Once a significant infera has occurred (index <0.6), it can be treated by lengthening the patellar tendon or by proximalization of the TT. Preoperatively the patellar height and tendon length can be accurately assessed from radiographs by measuring the C-D index. This information can also be obtained from magnetic resonance imaging (MRI). Tibial tubercle transfer is an easier procedure, but is less logical than lengthening the tendon itself if the tendon is short. TT transfer is generally insufficient to treat severe patella infera (C-D index <0.6).

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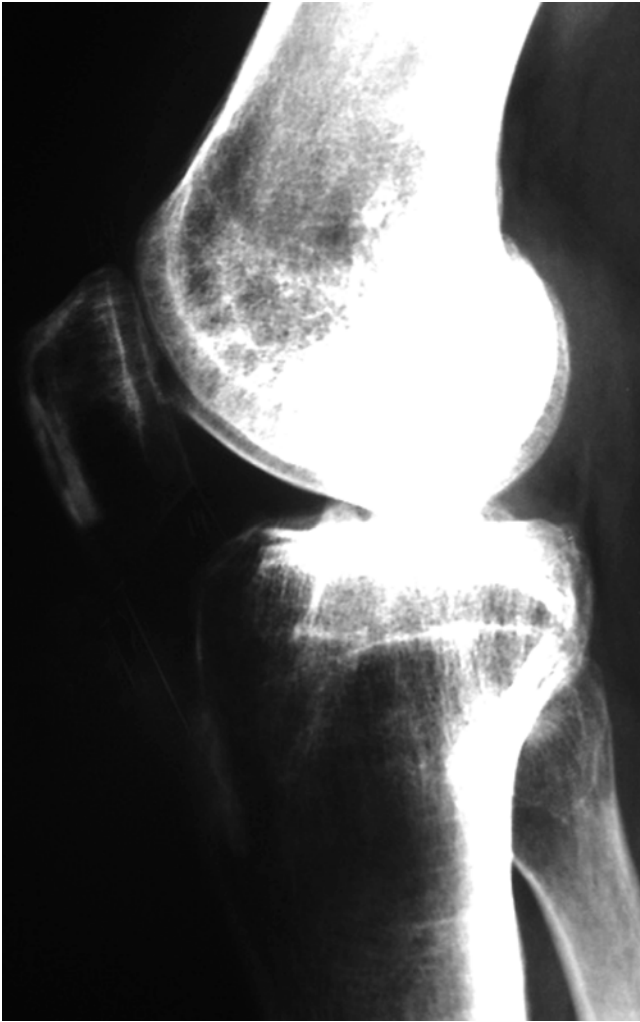


Fig. 37.1 Lateral radiograph of the knee showing patella infera

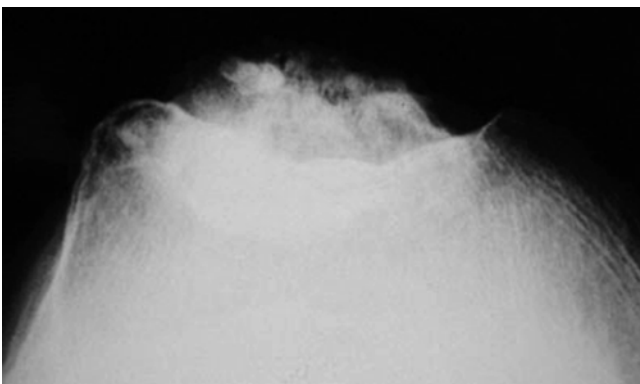


Fig. 37.2 Classical "sunset" sign on the axial radiograph

Surgical Technique for Lengthening the Patellar Tendon

This technique is based on the principle of the sliding flap first described by H. Dejour.

Incision

A midline longitudinal incision is made taking into consideration any previous incisions.

Patellar Tendon Lengthening

Expose the patellar tendon throughout its width and length and incise the tendon vertically from the tip of the patella to the tibial tubercle in the midline. The incision is continued over the patella and onto the quadriceps tendon for a distance of 2 cm (Fig. 37.3). The patellar tendon is released medially and laterally, and the fat pad (fat pad) is excised from the posterior aspect of the tendon.

The medial flap remains in continuity with the patella. It is mobilized by releasing the medial half of the patellar tendon from the TT with a 2 cm periosteal flap (Fig. 37.4). The incision medially is continued along the medial border of patellar tendon up to the patella, completely mobilizing the flap.

The lateral flap is the lateral half of the patellar tendon. The flap is left attached distally and elevated from the patella with a periosteal flap and a full-thickness strip of the quadriceps tendon. The vertical incision in the middle of the patellar tendon is extended over the patellar and onto the quadriceps tendon for 2 cm. Two centimeters above the top edge of the patella, the lateral aspect of the quadriceps tendon and the vastus lateralis are incised transversely. The lateral flap is then raised by elevating the full-thickness strip of patellar periosteum and quadriceps tendon off the patella and mobilizing the lateral strip of the patellar tendon. It is left attached on the tibial tuberosity (Fig. 37.5a, b). The elevation of the lateral flap completes the release of the patella from TT (Fig. 37.6).

An intraoperative radiograph ensures the correct restoration of patellar height (true lateral at 30° of flexion), and the medial and lateral flaps are sutured edge to edge along their entire length (Fig. 37.7). The lateral flap is fixed on the lateral part of the proximal pole of the patella, and the medial flap is fixed to the TT with two suture anchors (Fig. 37.8a, b).

The sliding flap is reinforced by a strip of PDS® (Fig. 37.9a, b). It is folded in half and fixed to the tibial tuberosity using an Orthomed® staple. The two strands are then sutured into a "V;" onto the patellar tendon, patella, and quadriceps tendon. The suturing is done at 60° of knee flexion to prevent shortening of the patellar tendon and the reoccurrence of a patella infera.

The closure often requires several small vertical incisions in the medial capsule close to the medial collateral ligament in order to lengthen the medial retinaculum.

The lateral retinaculum is left open.

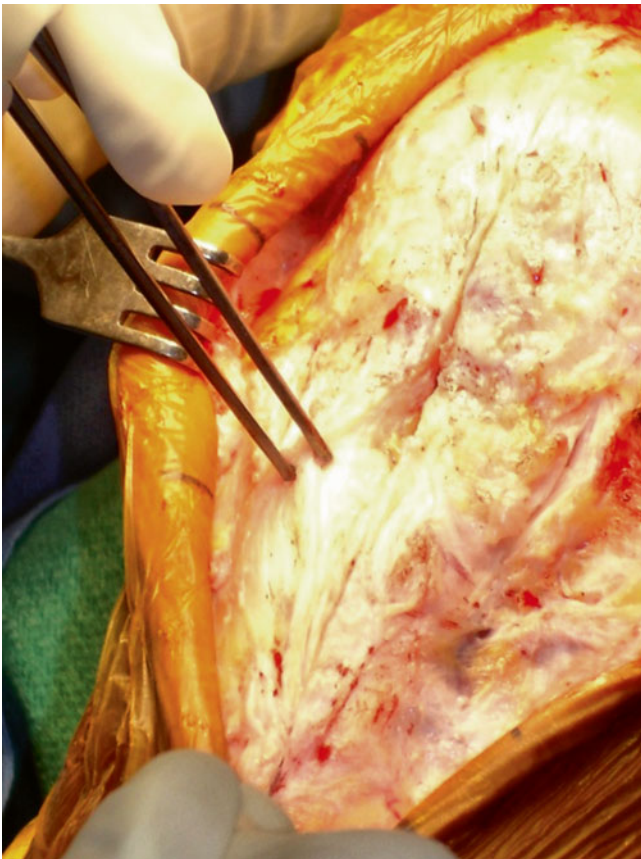


Fig. 37.3 Incising the patellar tendon

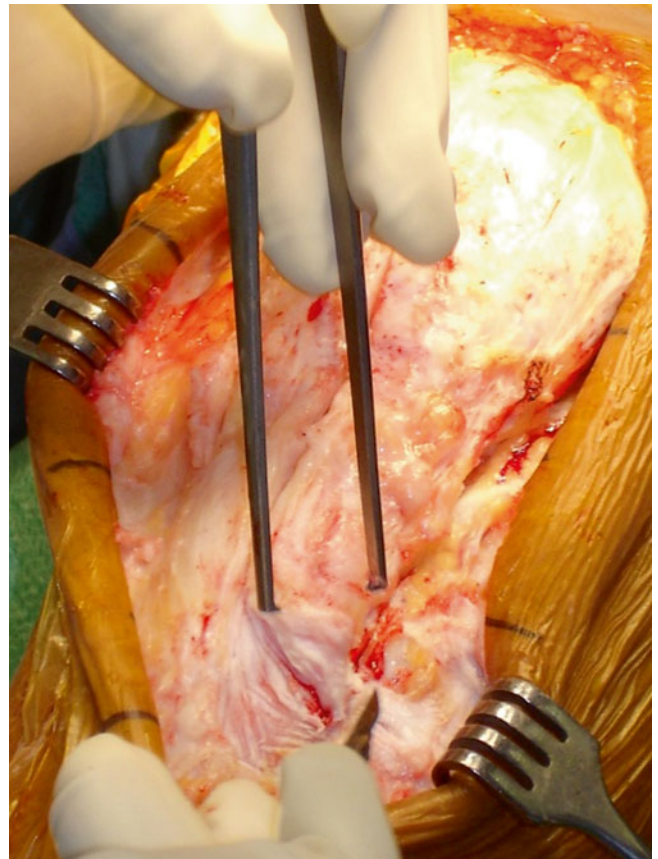


Fig. 37.4 Mobilizing the medial flap – medial half of the patellar tendon

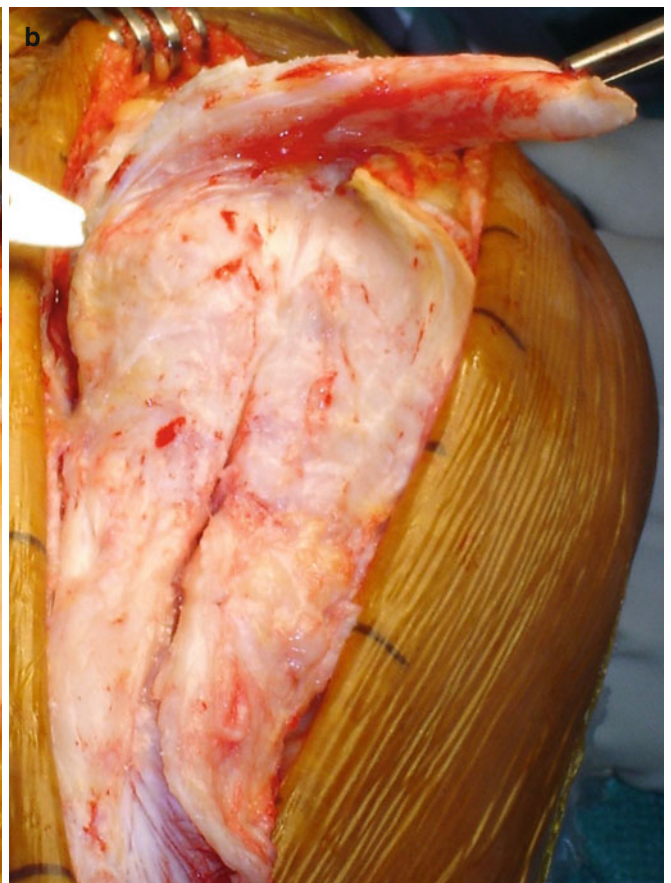
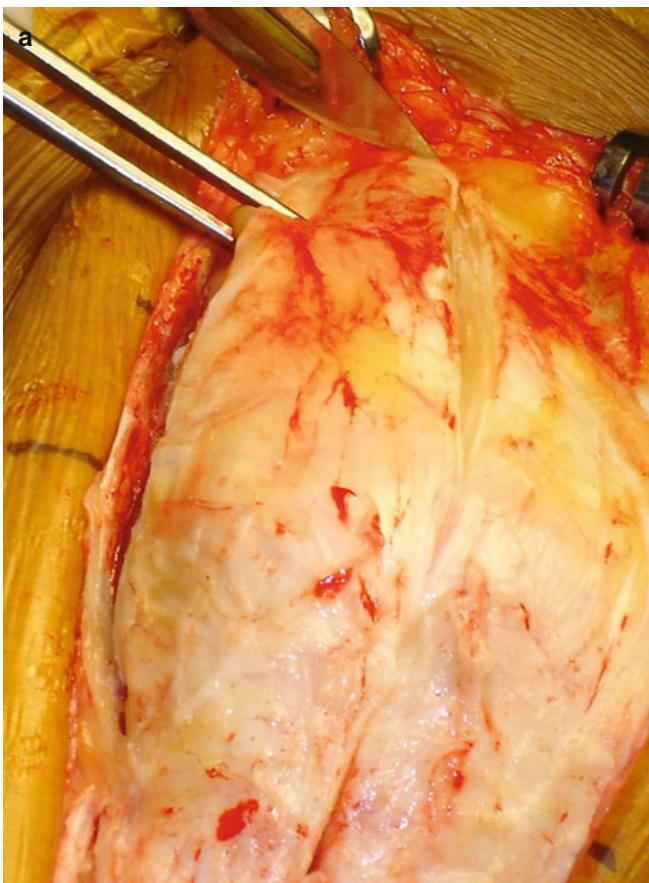


Fig. 37.5 (a, b) Mobilization of the lateral flap

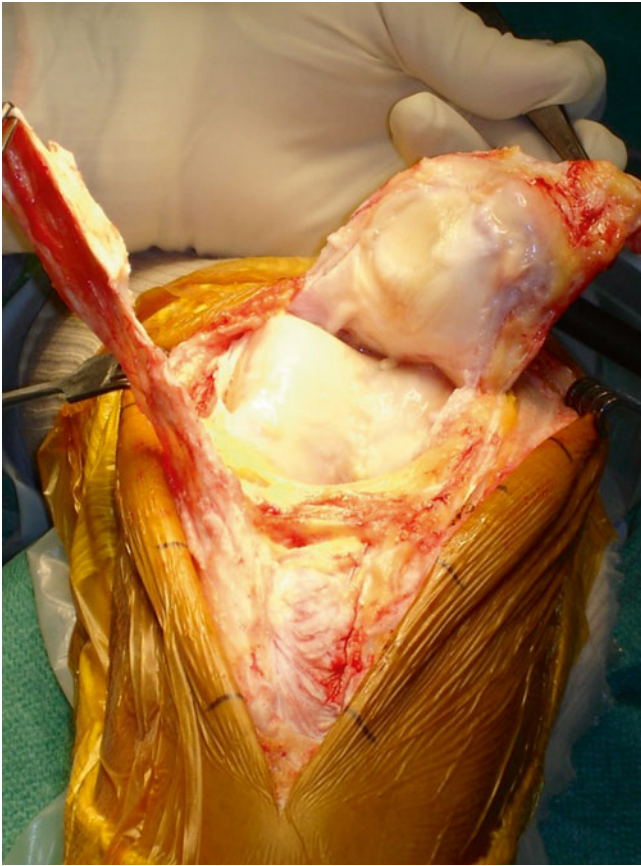


Fig. 37.6 Release of the patella

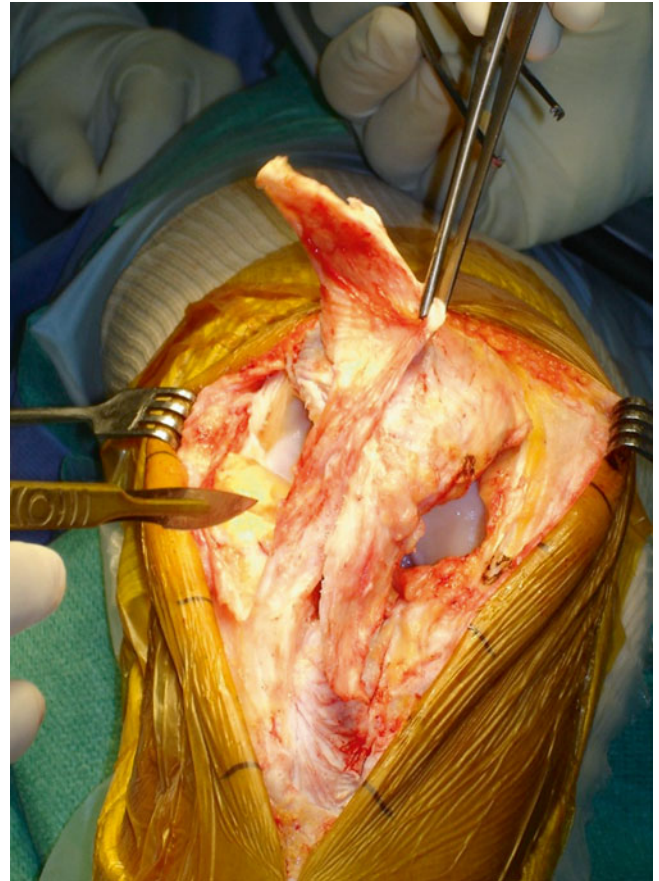


Fig. 37.7 Suture of the medial and the lateral flaps edge to edge

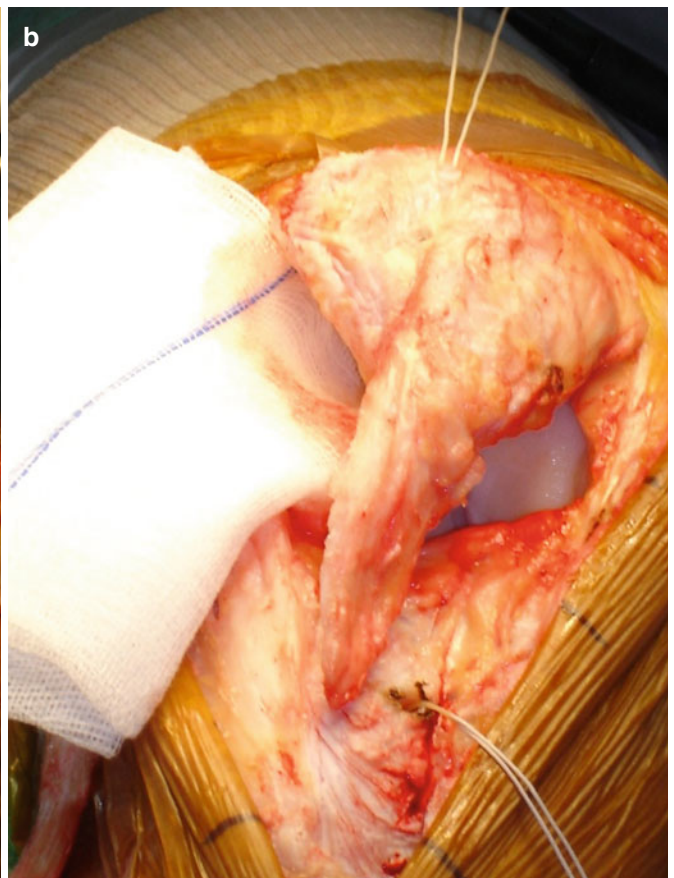
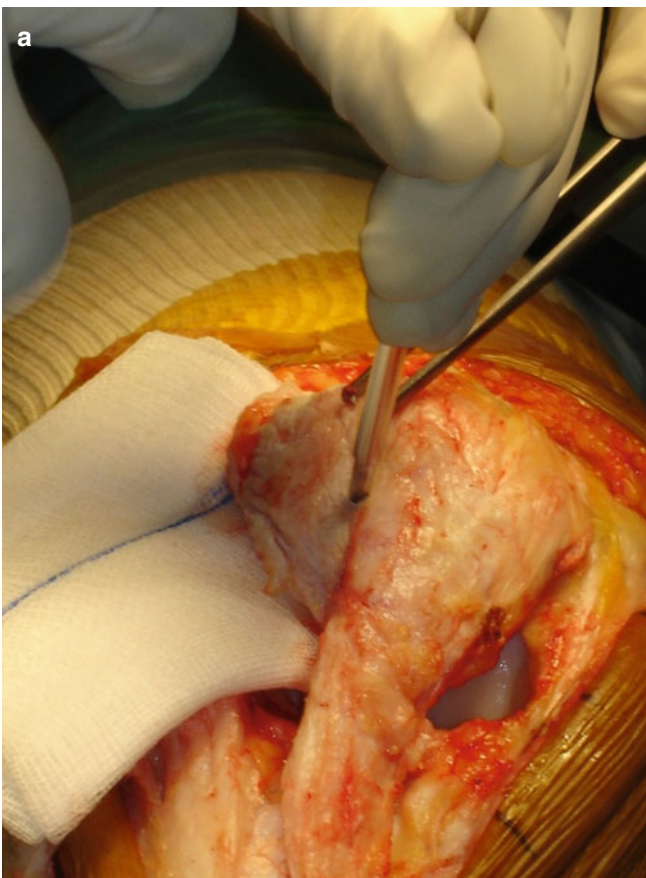


Fig. 37.8 (a, b) Suture anchors are used to fix the flaps to the patella and ATT respectively

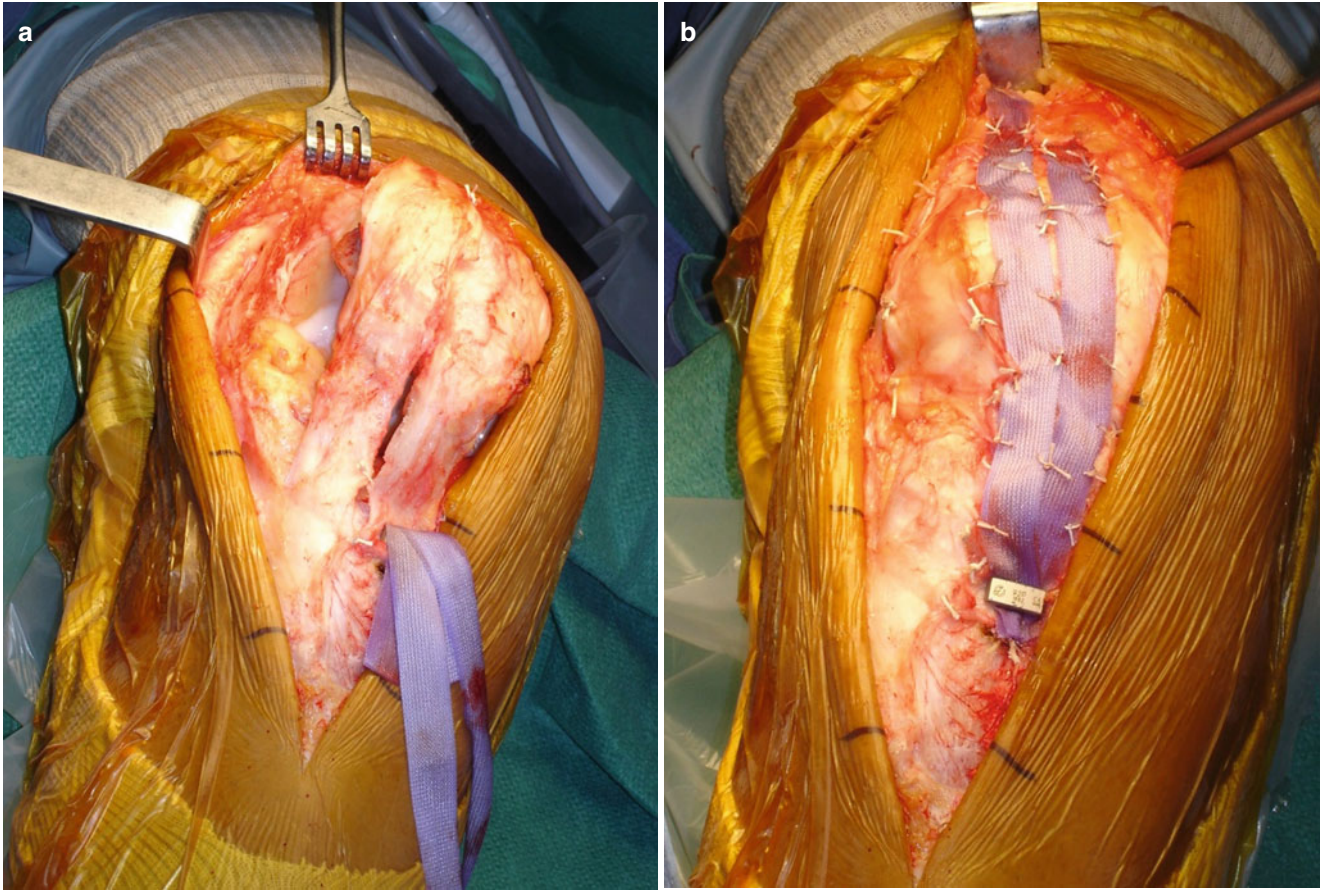


Fig. 37.9 (a, b) Reinforcement of the sliding flap with PDS tape

Postoperative

Radiographs should be obtained (Fig. 37.10). There is no specific physiotherapy protocol for lengthening of the patellar tendon. We recommend a protocol identical to that for

acute ruptures of the patellar tendon. The only difference being that the knee should be immobilized in 60° of flexion to keep the lengthened patellar tendon in slight tension. Therefore in the immediate postoperative period, the knee is immobilized on a cushion at 60° of flexion (Fig. 37.11).



Fig. 37.10 Postoperative x-ray



Fig. 37.11 Postoperative immobilization at 60° of flexion

Patella Infera Following TKA

Following TKA it is still unknown why patella infera causes pain. In cases that require surgery, we do not

recommend a simple sliding flap due to the significant risk of rupture. Instead we perform a technique involving an extensor mechanism reconstruction as described previously.