Patellar Femoral Arthritis and the Lateral Partial Patellectomy

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Introduction

Isolated patellofemoral arthritis (PFA) is a relatively rare condition. Above the age of 55, the incidence is estimated at 8% in females and 2% in males. The condition is bilateral in over 70% of the patients and in 80% of cases trochlear dysplasia can be identified as the major etiological factor.

Clinical Evaluation

Anterior knee pain is typically observed in patients with lateral patellofemoral arthritis. Ascending and descending stairs generally increases the pain. These patients are often unable to rise from a chair or squat without using their hands without significant pain. The ability of Muslims to pray sitting on the heels is limited. The nature of the pain is never excessive and generally does not interfere with activities of daily life. Walking on flat ground is usually not limited, which helps to differentiate between patellofemoral arthritis and tibiofemoral arthritis. Swelling of the knee is intermittently present. Manual pressure and manipulation of the lateral or medial facets usually evokes this specific pain. Range of motion of the knee is normal or near normal. Signs of patellar instability are generally absent.

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Radiographic Workup

The radiographic workup includes the following plain radiographs: anteroposterior weight bearing (including 45 degrees flexed "schuss" view), lateral weight bearing, and patellar axial skyline views. Primary etiological factors for lateral patellofemoral arthritis include trochlear dysplasia, patella alta, and trauma. One should always exclude inflammatory joint disease, tibiofemoral arthritis, and the sequelae of complex regional pain syndrome. The differential diagnosis should include chondrocalcinosis. In our opinion, meniscal calcifications, which are frequently observed on plain radiographs, are not indicative of chondrocalcinosis but indicate small calcifications secondary to a prior hemarthrosis. Chondrocalcinosis is characterized by the typical recess above the trochlea and the typical radiographic sign of the patella femoral joint shaped like a "saw." Patellofemoral degenerative lesions can be classified according to Iwano, in four stages (Fig. 22.1a–d):

Stage 1: Presence of osteophytes, joint space width narrowing, remodeling of the subchondral bone.
Stage 2: Joint space width narrowing less than 3 mm.
Stage 3: Joint space width narrowing more than 3 mm.
Stage 4: Absence of joint space. The patella can have the shape of a beret (Fig. 22.2).

CT imaging can help determine possible indicators for patellofemoral instability. An MRI is useful to evaluate the tibiofemoral compartment.

Treatment

Options

Treatment options for lateral patellofemoral arthritis are numerous. Conservative therapy is generally prescribed for the early stages of patellofemoral arthritis (modifications of

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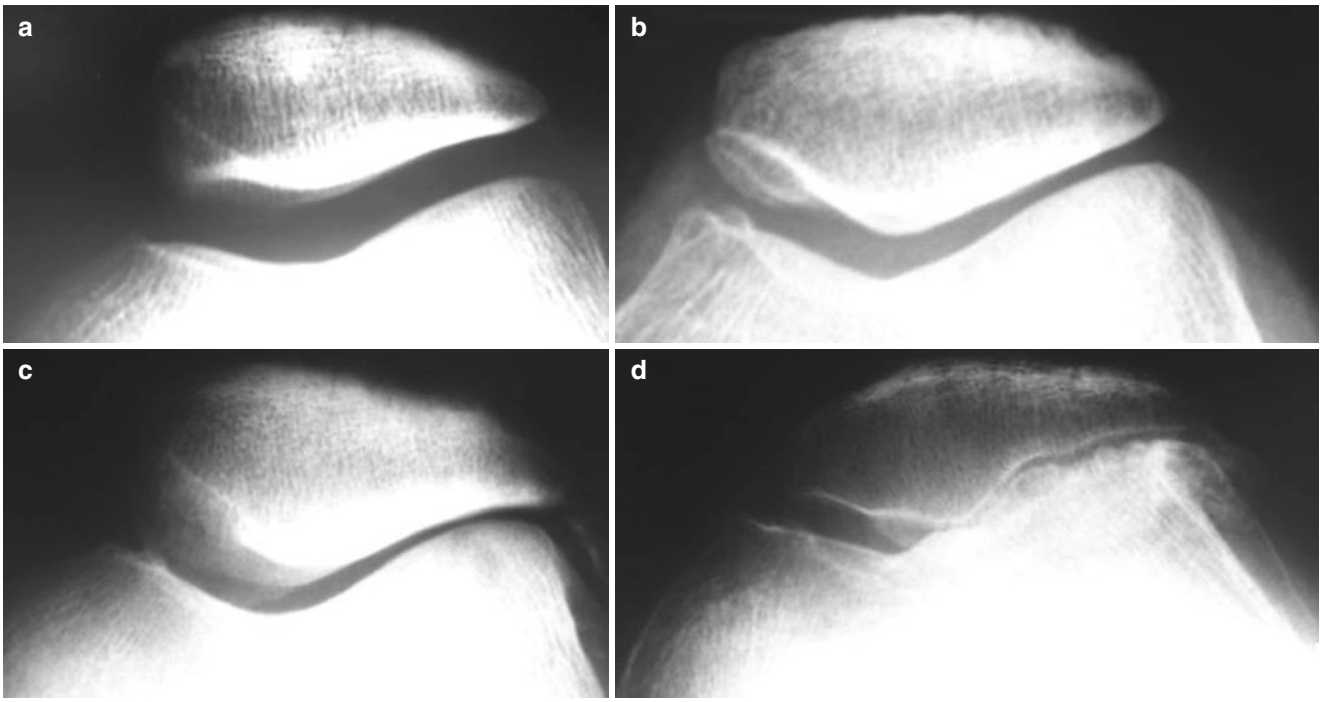

Fig. 22.1 Iwano classification of isolated patellofemoral osteoarthritis. (**a**): Stage 1, Slight; (**b**): Stage 2, Joint space width narrowing less than 3 mm; (**c**): Stage 3, Joint space width narrowing more than 3 mm; (**d**): Stage 4, Absence of joint space

Fig. 22.2 Béret Basque

ADL's, NSAID's, physiotherapy, and injections of corticosteroids or hyaluronic acid). Nevertheless, surgery can be indicated if the symptoms are severe or if they fail to respond to conservative therapy. Surgical treatment is determined by several factors: the age of the patient, the patient's profession, the patient's function in activities of daily living, and the clinical symptoms.

Non-arthroplasty Surgery

Arthroscopic Debridement, Chondroplasty, and Lavage

The efficacy of these procedures is disputed. Clinical improvement is not reproducible and often of short duration. Therefore, we do not recommend or perform them.

Lateral Patellar Release

Isolated lateral patellar release is controversial and therefore not generally indicated for anterior knee pain. We do consider this procedure in cases of lateral facet overload characterized by pain over the lateral patellar facet and increased patellar tilt (indicative of a pathologically tight lateral retinaculum) in patients without significant patellofemoral arthritis on radiographs. Some authors have described Z-lengthening of the lateral retinaculum in such cases with good results.

Tibial Tubercle Osteotomy

The principles of this technique are to decrease patellofemoral contract pressure and transfer the weight bearing area from the area of wear to another region with intact articular cartilage. It is therefore contra-indicated in cases of complex regional pains syndromes and generalized diffuse patellofemoral arthritis.

(a) Anteriorization of the Tibial tubercle.

Introduced and popularized by Maquet, the aim of this procedure is to reduce the contact pressure of the patellofemoral articulation. This technique is fraught with complications and therefore it is not performed as a routine procedure. If we desire anteriorization of the tibial tubercle, we generally perform an anteromedialization of the tubercle as described by Fulkerson.

(b) Medialization of the tibial tubercle.

For lateral patellofemoral arthritis secondary to episodic dislocation of the patella, this technique is usually performed. A medialization of about 5 mm is usually desired. This technique can be combined with a partial lateral patellar facetectomy. We have abandoned the performance of a VMO advancement in such cases due to complications during rehabilitation. This technique is routinely combined with a lateral patellar release if the retinaculum is noted to be pathologically tight.

(c) Distalization of the tibial tubercle.

This technique is indicated in the cases of a patella alta. Although this technique seems logical in terms of displacement of the contact zone, the postoperative period is long and characterized by a persistent swelling of the knee. Commonly, pain reduction is incomplete.

Lateral Vertical Partial Patellectomy (Lateral Facetectomy)

See complete description below.

Total Patellectomy

A total patellectomy is characterized by a subsequent weakness of the extensor apparatus. It also results in a large scar. Therefore, this technique should be used only in cases of severe post-traumatic arthritis. It should be noted however that resection of up to 25% of the total width of the patella does not affect patellofemoral biomechanics.

Arthroplasty

Patellofemoral Arthroplasty

The success rate of patellofemoral arthroplasty varies from 44% to 90%. The clinical outcome is superior to an isolated resurfacing of the patella. Reasons for failure include progressive tibiofemoral arthritis, implant malpositioning, and malalignment of the extensor apparatus (failure to correct an increased TT-TG). Due to the inconsistency in the results, we do not perform this procedure routinely.

Total Knee Arthroplasty

In the older patients, the total knee arthroplasty remains the treatment of choice for lateral patellofemoral arthritis. Pain reduction and improvement of function are excellent. Patients' satisfaction is especially high in patients with significant preoperative functional restrictions and limited expectations.

Partial Lateral Patellectomy or Lateral Facetectomy

This procedure is technically easy to perform; however, the indications are limited. Ideally, the patients should be between 40 and 65 years of age and only limited during certain physical activities (ascending and descending stairs). Walking distance and flexion should be within normal limits. Conservative therapy should have been tried for at least 6 months. The patients should not be obese and should be normally aligned in the frontal plane. Palpation of the lateral border of the patella should evoke pain.

Plain radiographs, including the schuss view, should confirm absence of pathology in the tibiofemoral joint. The patellar skyline view should show an osteophyte or a typical "beret" aspect of the patella.

CT imaging allows evaluation of the TT-TG distance. It should be within normal limits. If an excessive TT-TG is measured, a medialization of the tibial tubercle may be indicated.

Surgical Technique

The patient is placed in the supine position with a tourniquet applied. An arthroscopy can be performed initially to evaluate the tibiofemoral joint as well as to remove potential loose bodies in the knee joint. In our experience, arthroscopy is rarely required (Fig. 22.3).

A lateral parapatellar skin incision is created, centered for the patella and measuring 5–6 cm in length. The lateral retinaculum is released (Fig. 22.4). The release should not involve the distal fibers of the vastus lateralis. The knee is now placed in extension and the articular surfaces of the patella and trochlea are inspected (Fig. 22.5).

The pre-patella soft tissues are carefully released from the anterior border of the patella over a distance of 1 cm using a 15 blade (Fig. 22.6). Between 1 and 1.5 cm of the lateral patella facet, including its osteophyte are then resected using an oscillating saw. The articular surface is protected by

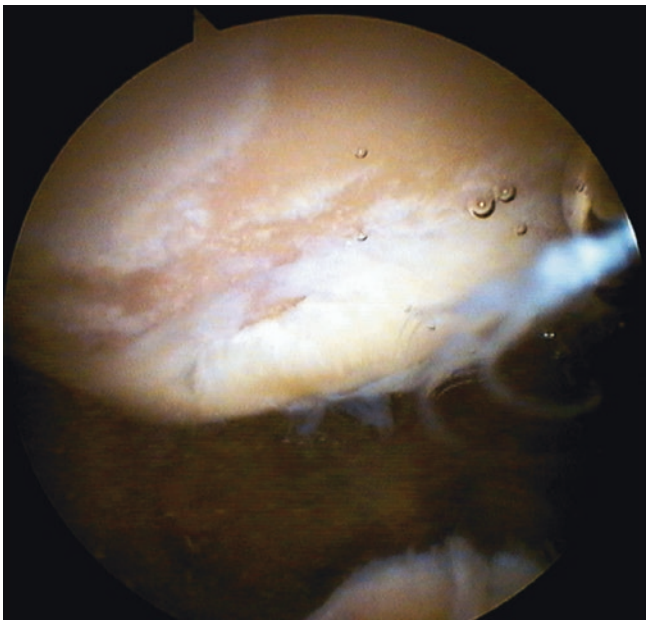

Fig. 22.3 Arthroscopic view: patellofemoral osteoarthritis with apparent subchondral bone

Fig. 22.4 Lateral parapatellar skin incision

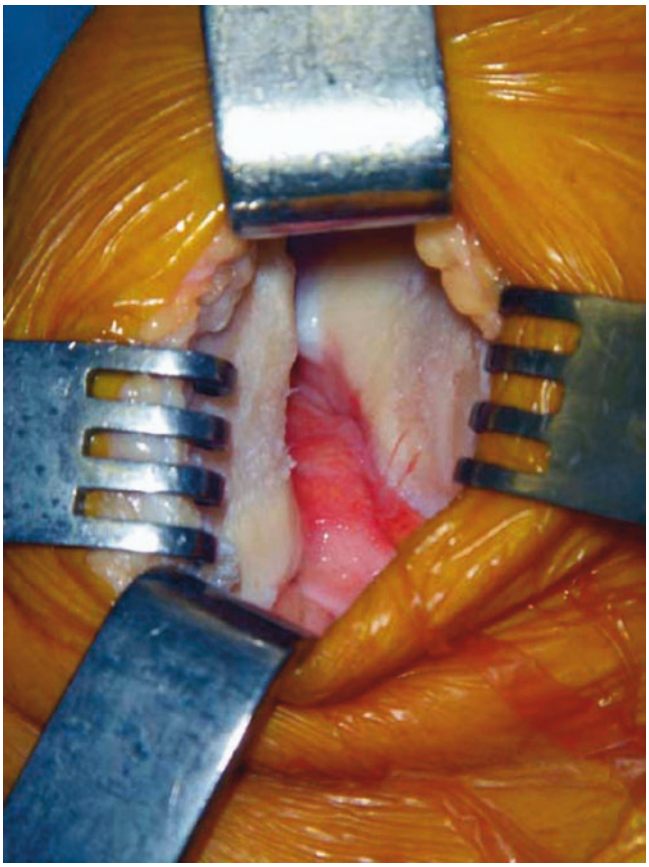

Fig. 22.5 Lateral retinaculum release and inspection of the patella and trochlea

retractors or by placing a sponge/swab into the patellofemoral joint (Figs. 22.7 and 22.8). The resected area generally goes from the lateral insertion of the patella tendon to the lateral insertion of the vastus lateralis and must be sufficiently large. Very frequently, the inexperienced surgeon will be somewhat disappointed about the obtained resection on the postoperative radiograph (Fig. 22.9).

The capsule is not closed in the middle and distal portions of the patella. Hemostasis should be carefully performed (bone wax may be applied to the resection area). An intra-articular drain may be left for 24 hrs.

Postoperative Guidelines

Ice application should be limited to 3–4 days post op. Thromboprophylaxis is continued for 10 days. As for all surgery on the patellofemoral joint, the brace should be in 20° of flexion at rest and in extension for walking. Isometric quadriceps contractions and continuous passive motion should start of the first postoperative day. Weight bearing is allowed immediately. Walking with crutches is allowed for 3–5 days after which quadriceps training is started.

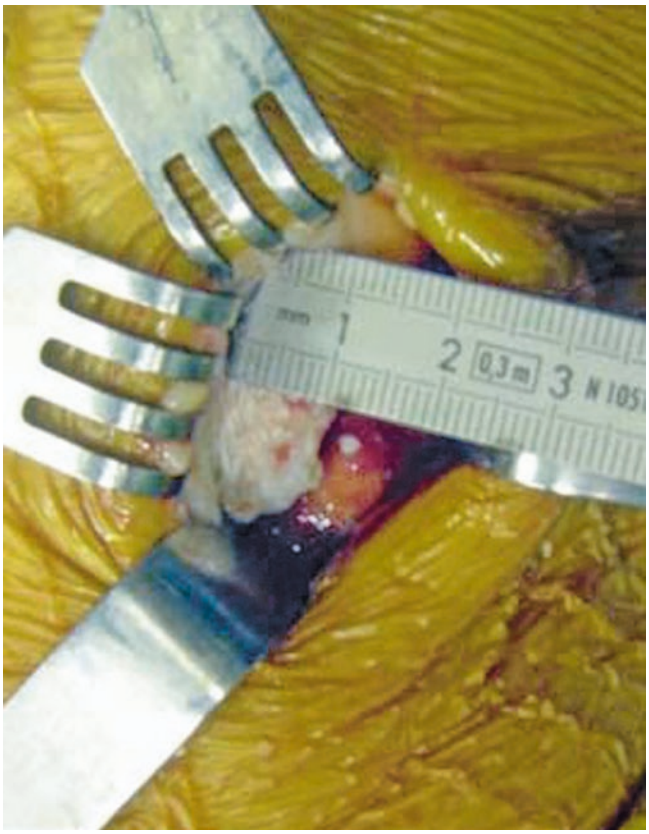

Fig. 22.6 Release of the pre-patella soft tissues from the anterior border of the patella

Fig. 22.7 Resection of the lateral patella facet (1–1.5 cm)

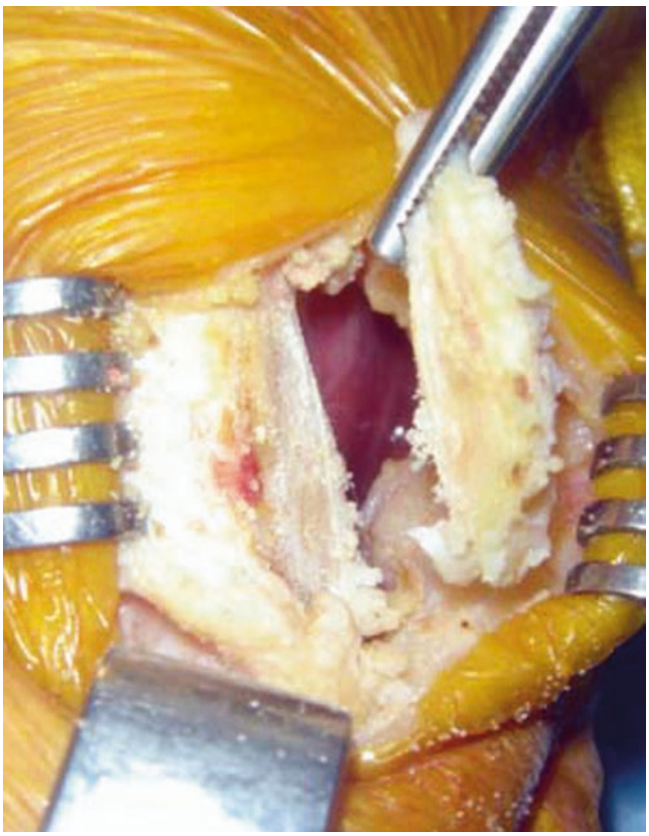

Fig. 22.8 Final view after resection

Rehabilitation should be progressive, slow, and should not provoke pain. Return to normal activities of daily living is allowed after 1 or 2 months. Downhill walking is not allowed for 2–3 months, and squatting for 6 months.

Complications

Complications include hematoma and pain because of an insufficiently large resection.

No specific complications were noted in our recently published series. Functional outcome is encouraging even if the radiological results are mediocre. With a mean follow-up of 8 years, no further surgery after facetectomy had to be performed in our series.

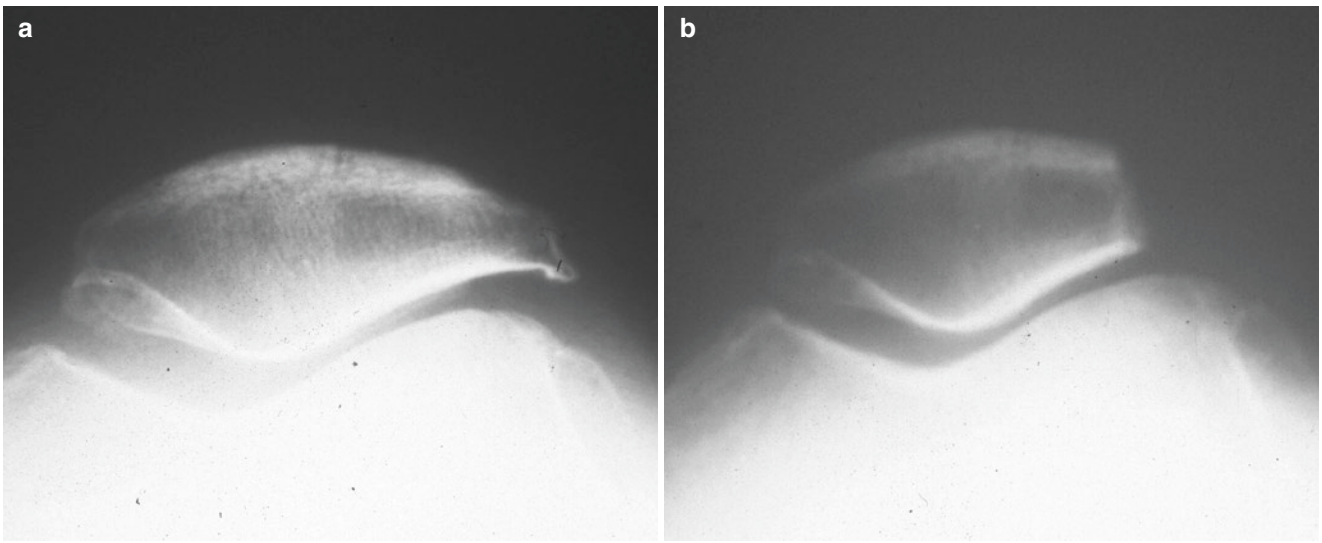

Fig. 22.9 Preoperative (**a**) and postoperative (**b**) X-rays (skyline views)