Recent Trends In Management Of Patellofemoral Osteoarthritis

Essay

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Abstract

Patellofemoral arthritis is a musculoskeletal common complaint. It is the most common diagnosis of anterior knee pain presenting to sports medicine and physiotherapy practice. When the disease is in its early stages, a careful and complete course of nonoperative treatment may provide sufficient pain relief and functional improvement. If surgery is required, limited soft-tissue procedures such as arthroscopic lateral release and debridement may work well, if the lateral portion of the joint is primarily affected. Tibial tubercle transfer, particularly anteromedialization, is a powerful way to correct malalignment and offload the lateral and distal parts of the patella. The indications for tibial tubercle transfer may expand if it proves to be a successful adjunct to cartilage resurfacing procedures. For more severe disease, patellofemoral arthroplasty has evolved into a safe and reliable alternative.

Key words :

Patellofemoral-parthritis-pain-knee-arthroscopic arthroplasty.

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List of abbreviations

Abbreviation	Description
VMO	Vastus medialis obliquus.
MPFL	Medial patellofemoral ligament.
MPTL	Medial patellotibial ligament.
MPML	Medial patellomeniscal ligament.
PFJRF	Patellofemoral joint reaction force.
QF	Quadriceps force.
PLF	Patellar tendon ligament force.
OA	Osteoarthritis.
HLA	Human leucocytic antigen.
KS	Keratan sulfate.
AGE	Advanced glycation end products.
RAGE	Receptor for advanced glycation end products.
TIMMP	Tissue inhibitor metalloproteinases.
PF	Patellofemoral.
TKA	Total knee arthroplasty.
NSAIDS	Non steroidal anti inflammatory drugs.
COX	Cyclooxygenase.
IL	Interleukin.
TNF	Tumor necrosis factor.
PFA	Patellofemoral arthroplasty.

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The knee joint is a complex structure with three main compartments that have individual functions and structures: the inner (medial) compartment and the outer (lateral) compartments are formed by the articulation of the lowest part of the the femur and the highest part of the tibia. The third compartment of the knee is formed by the patella and the front part of the femur and is called the "patellofemoral joint."

Patellofemoral pain is a musculoskeletal common complaint. Prospective studies have identified that approximately 10% of active people will develop patellofemoral pain. It is the most common diagnosis of anterior knee pain presenting to sports medicine and physiotherapy practice. [(4)]

Knee arthritis frequently affects two or more compartments of the knee. However, in rare cases, arthritis may be isolated to the patellofemoral compartment. This condition, which is more commonly seen in women, is characterized by pain in the front part of the knee (behind the patella) that typically worsens when the patient walks on inclined terrain, goes up and down stairs, knees, squats, and rises from the sitting position**.** [(30)]

Patellofemoral arthritis is a common cause of anterior knee pain. When the disease is in its early stages, a careful and complete course of nonoperative treatment may provide sufficient pain relief and functional improvement. If surgery is

required, limited soft-tissue procedures such as arthroscopic lateral release and debridement may work well, if the lateral portion of the joint is primarily affected. Tibial tubercle transfer, particularly anteromedialization, is a powerful way to correct malalignment and offload the lateral and distal parts of the patella. The indications for tibial tubercle transfer may expand if it proves to be a successful adjunct to cartilage resurfacing procedures. For more severe disease, patellofemoral arthroplasty has evolved into a safe and reliable alternative. When a patient is older or when the arthritis is more diffuse, total knee arthroplasty is a reliable and reproducible way to improve function and decrease pain. Care must be taken to properly position components to avoid problems with the patellar component after the surgery. **(30)**

When a patient presents with mechanical symptoms and a loose body is suspected or confirmed on imaging studies, an arthroscopic debridement may be warranted. A chondroplasty may also temporarily relieve discomfort and disability when patellofemoral arthritis is present and associated with swelling, crepitus, and synovitis. Removal of loose cartilage from the patella or femur may limit mechanical irritants as well. The surgeon must realize that these measures may have only temporary effects on symptoms and if underlying mechanical factors have contributed to the progression of the disease they

will continue to contribute to the clinical progression of symptoms as well.

Proximal soft tissue realignment procedures have also been advocated as a way to unload the lateral facet and improve patellar tracking. These procedures are focused on arthritis affecting the lateral facet and have limited utility for patients with more generalized arthritis. In particular, disease of the trochlea or medial facet may lead to an increase in pain following lateral release procedures. For patients with continued symptoms emanating from the lateral aspect of the joint, more aggressive alignment procedures may be required. [(5)]

Tibial tubercle transfer is recommended for treatment of patellofemoral arthritis in patients in whom unloading of discrete areas of patellar and femoral disease can lead to clinical success. Requisite for this procedure is healthy cartilage onto which patellar loading and tracking can be transferred. Tibial tubercle transfer, when combined with cartilage resurfacing, holds great promise and may reduce the need for early patellofemoral arthroplasty.

Patellectomy has been performed for over a century as one of the surgical treatments of severe anterior knee pain. Its popularity has waxed and waned over time, with mixed results and opinions regarding its effectiveness. The operation should be viewed as a salvage procedure, and the surgeon should warn the patient against unrealistic expectations concerning the

outcome. Historically, the best results have been noted in patients with severe arthrosis of the patellofemoral joint. [50]

There has been a recent resurgence of interest in patellofemoral arthroplasty. It has been indicated for end-stage patellofemoral arthritis, when deterioration of the patellofemoral joint is diffuse. Short term reports have shown a high level of effectiveness, particularly when alignment issues are corrected. Patellofemoral arthroplasty can work well in patients of normal stature with isolated patellofemoral disease. [70]

The use of total knee replacement to treat severe isolated patellofemoral arthrosis that is recalcitrant to therapeutic measures has been well established for older patients. [70]The procedure is not advocated for younger patients with isolated patellofemoral arthritis, but it can be used with reliable results in patients in their eighth decade of life. Total knee replacement should not be considered until nonoperative management has failed. [30]

Anatomy of patellofemoral joint

The patellofemoral joint is the portion of the knee joint between the patella and the femoral condyles. The patellofemoral articulation totally depends on the function of the quadriceps. The patella forms a mobile firm site for the attachments of ligaments and tendons of the extensor side of the knee. It increases the angle of pull of the patellar tendon, improving the mechanical advantage of the quadriceps in knee extension [(80)]. The patella, the quadriceps tendon, ligamentum patella, and the retinacular fibers form the capsule of the knee joint anteriorly and provide protection for the anterior portion of the knee joint (Fig.1).

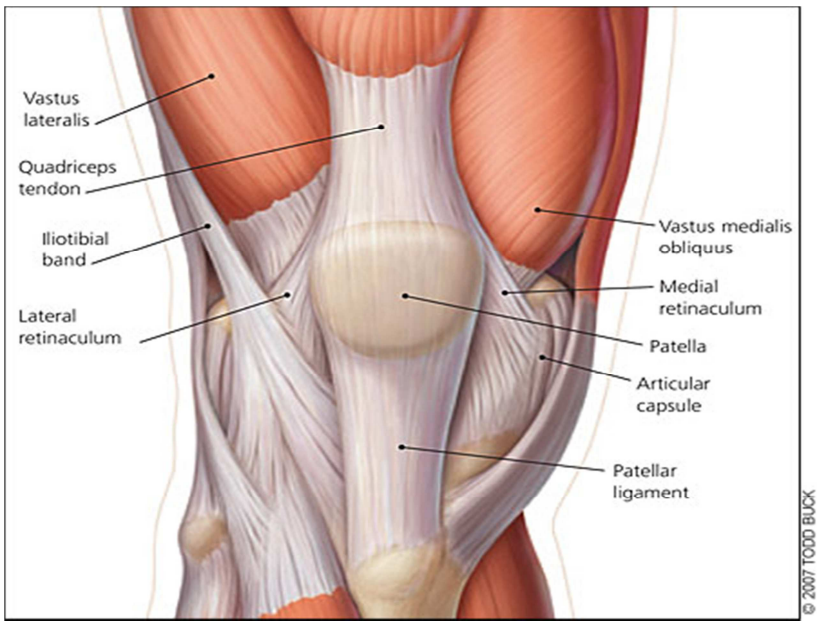

Fig.(1): Anterior view of the knee[(80)] .

The patellofemoral joint are formed of osseous and soft tissue structures.

The osseous structures are:

The **patella** and the distal part of the **femur.**

The Patella (Knee Cap)

The **patella** is a flat, triangular bone, situated on the front of the knee joint. It is usually regarded as a sesamoid bone, developed in the tendon of the Quadriceps femoris, and resembles these bones; (1) in being developed in a tendon, (2) in its center of ossification presenting a knotty or tuberculated outline, (3) in being composed mainly of dense cancellous tissue. It serves to protect the front of the joint, and increases the leverage of the Quadriceps femoris by making it act at a greater angle. It has an anterior and a posterior surface, three borders, and an apex [(80)].

Surfaces:

The anterior surface (Fig.2)**:** Is convex, perforated by small apertures for the passage of nutrient vessels, and marked by numerous rough,longitudinal striae. This surface is covered, in the recent state, by an expansion from the tendon of the Quadriceps femoris, which is continuous below with the superficial fibers of the ligamentum patellae. It is separated from the patellar ligament by a bursa [(80)].

Fig.(2): Anterior surface of the patella[80] .

The posterior surface (Fig.3)**:** Presents above a smooth, oval, articular area, divided into two facets by a vertical ridge; the ridge corresponds to the groove on the patellar surface of the femur, and the facets to the medial and lateral parts of the same surface; the lateral facet is broader and deeper. Below the articular surface is a rough, convex, non-articular area, the lower half of which gives attachment to the ligamentum patellae; the upper half is separated from the head of the tibia by adipose tissue [80].

Fig.(3): Posterior surface of the patella[80] .