Recent Trends in Treatment of Non-traumatic Patellofemoral Pain Syndrome in Adults

Essay

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List of Abbreviations

Abb.	Full term
3D FISP	*Fast Imaging with Steady State Free Precession*
ADSCs	*Autologous Adipose-Tissue-Derived Stem Cells*
AKP	*Anterior Knee Pain*
AP	*Antroposterior*
BMI	*Body Mass Index*
BT	*Botulinum Toxin*
CT	*Computed Tomography*
DESS	*Dual Echo Steady State*
EMG	*Electromyography*
EPD	*Episodic Patellar Dislocation*
ITB	*Iliotibial Band*
LPOS	*Lateral Patellofemoral Overload Syndrome*
LR	*lateral Release*
MACI	*Matrix Induced Autologous Chondrocyte Implantation*
MPFL	*Medial Patellofemoral Ligament*
MPML	*Medial Patellomenscial Ligament*
MPTL	*Medial Patellotibial Ligament*
MRI	*Magnetic Resonance Imaging*
MSCs	*Mesenchymal Stem Cells*
OCD	*Osteochondritis Dissicans*
PFJ	*Patellofemoral Joint*
PFOA	*Patellofemoral Osteoarthritis*
PFP	*Patellofemoral Pain*
PFPS	*Patellofemoral Pain Syndrome*
PRP	*Platelet Rich Plasma*

List of Abbreviations

Abb.	Full term
ROM	*Range of Motion*
TFL	*Tensor Fasciae Lata*
TG	*Trochlear Groove*
TKR	*Total Knee Replacement*
TT	*Tibial Tuberosity*
TTT	*Tibial Tubercle Transfer*
VL	*Vastus Lateralis*
VMO	*Vastus Medialis Obliquus*

INTRODUCTION

Patellofemoral pain syndrome (PFPS) is difficult to define, as patients experience a variety of symptoms from the patellofemoral joint with different levels of pain and physical impairment. The terminology is thus still widely discussed. Anterior knee pain, chondromalacia patella, patellofemoral arthralgia, patellar pain, patellar pain syndrome and patellofemoral pain are often used synonymously with PFPS. [1]

The term 'anterior knee pain' is suggested to encompass all pain-related problems of the anterior part of the knee. By excluding anterior knee pain due to intra-articular pathology, peripatellar tendinitis or bursitis, plica syndromes, Sinding Larsen's disease, Osgood Schlatter's disease, neuromas and other rarely occurring pathologies.

It is suggested that remaining patients with a clinical presentation of anterior knee pain could be diagnosed with PFPS. [1, 2]

PFPS is a disorder of the patellofemoral joint in which abnormal tracking of the patella through the femoral groove is often cited as the culprit. The result of the maltracking is pain and retropatellar cartilage loss.

The etiology of PFPS is multifactorial, making examination and treatment difficult. Patellofemoral pain accounts for 25% of knee injuries in the general population and

may be responsible for an even higher proportion in athletes.In a retrospective study that explored the natural history of patellofemoral pain in athletes, running contributed to one-third of cases. This injury is seen more commonly in women and occurs predominately in athletes under age 25 years. [3, 4]

The classical presentation of patients with PFPS is anterior knee pain that typically occurs with activity and often worsens when going up or down steps or hills. It can also be triggered by prolonged sitting. One or both knees can be affected. It is an overuse disorder and is the most common cause of knee pain seen by primary care providers. [5] It is often seen in athletes, most often in runners. There is a higher incidence in women and increased incidence with increased age. [6]

Consensus is lacking regarding the cause of the syndrome. PFPS is thought to be due to abnormal forces across the patella due to one or more of: a tracking disorder of the patella in the femoral groove, muscular imbalance in the quadriceps, abnormal patellar anatomy, altered foot or ankle biomechanics, an increased Q angle, and abnormal development of the femoral condyles. [7] These can occur due to trauma, joint overload, overuse, or misalignment. [8]

The diagnosis of PFPS is approached by 4 steps:

1) History and Symptoms (subjective findings) like history of knee injury, pain after prolonged physical activity, limited ROM and crepitus.

2) Physical examination (objective findings) including inspection, palpation and special physical examination in standing, sitting, supine and side lying positions.
3) Imaging evaluation, firstly including plain X Rays (AP, Lat, and Axial) then C.T scan and MRI is considered to the patients who do not improve.
4) Arthroscopic assessment has a dual benefit as it may diagnose and treat the cause.

Treatment; when treating PFPS, it is important to assess not only the knee biomechanics of patients, but also hip and foot biomechanics. When doing so, both dynamic and static alignment should be assessed.

Physical therapy: is the mainstay of treatment for PFPS. It may be used alone or in conjunction with other modalities. Some of other nonsurgical treatments include taping, patellar tracking braces, and foot orthotics.

These secondary modalities are often used for treatment at the time of diagnosis, but many reserve them for failures of treatment with physical therapy.

Surgical treatment: Patients with recurrent patellar dislocation and/or trochlear dysplasia are treated according to the presence of concomitant predisposing anatomic abnormalities and/or trochleoplasty is combined with other procedures (lateral retinculum release, lateral patellar factectomy, MPFL reconstruction, tibial tubercle transfer, femoral derotation osteotomy) when needed.

Aim of the Work

The aim of this work is to provide an up-to-date overview of recent trends in treatment of non-traumatic Patellofemoral Pain Syndrome in adults.

ANATOMY AND BIOMECHANICS OF PATELLOFEMORAL JOINT

Anatomy

The patella

The patella is the largest sesamoid bone. It is encompassed by the quadriceps mechanism. It is the central component of the patellofemoral joint. Its articular surface is the thickest to be found in the body and can measure up to 4-5 mm in its central portion. The patella is divided into lateral and medial facets by the median ridge or crest. The medial facet is subdivided into a medial facet proper and an "odd" facet smaller. [9]

The quadriceps tendon sends a few superficial fibers across the front of the bone, its anterior surface and from each side extension (patellar retinaculae) from the vasti, pass down to the ligamentum patellae. [10]

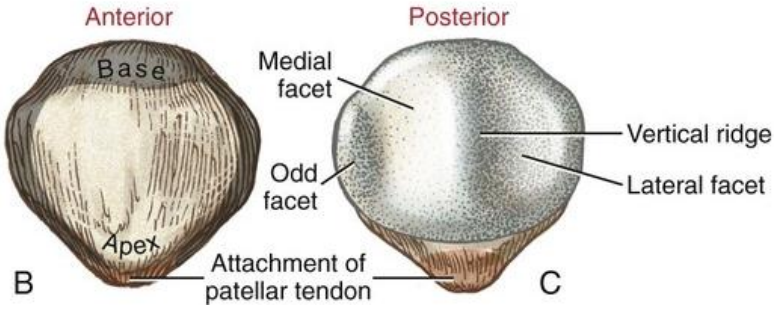

Fig. (1): Patellar facets. [11]

Wiberg [12] has described three basic shapes of the patella (Fig. 2):

- **Type 1:** medial and lateral facets are roughly of the same length
- **Type 2:** Is the most common, the medial facet is only half the size of the lateral facet.
- **Type 3:** lateral facet makes up the majority of the posterior surface (medial facet is so far medial that the central ridge is barely noticeable).