Pathophiology

- Malalignment: abnormal tilt, abnormal Q angle
- Abnormal torsion: dysplasia (trochlear and patellar)
- Instability
- Trauma
- Inflammatory arthritis
- Obesity
- Osteoarthritis

Malalignment

- Merchant and Mercer in California and Ficat and colleagues in France: tilt patellar and tight lateral retinaculum leads to increase PF pressure
- Malalignment leads to OA?
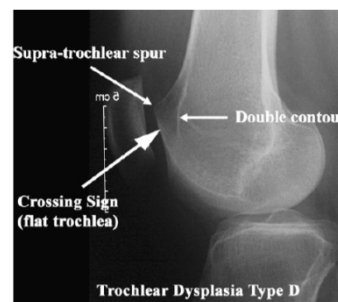- Patients w/ PF OA often demonstrate malalignment

Grelsamer, Orthop Clin N Am 39 (2008) 269–274

Malalignment

- Abnormal Q-angle
- Abnormal distal femoral torsion
- Patient w/ malalignment is good candidate for tibial tuberosity transfers and patellofemoral replacement

Patellofemoral dysplasia

- Steep or shallow trochleas
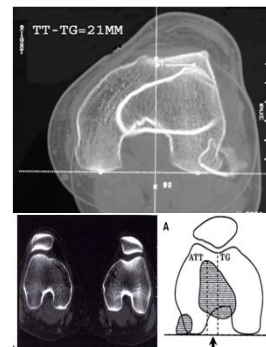
- Trochleas featuring an area of convexity proximally

[Dysplasia types figure]

Type A: crossing sign, with trochlear morphology preserved
Type B: crossing sign, supratrochlear spur, and flat or convex trochlea.
Type C: crossing sign, with double contour.
Type D: crossing sign, supratrochlear spur, double contour, asymmetry of trochlear facets, and vertical link between medial and lateral facets (cliff pattern).

Dejour D, Sports Med Arthrosc. 2007;15:40.

Offset of the tibial tuberosity to trochlear groove

- Knee in extension
- Superimposed Axial CT
- Tibial tubercle-to-trochlear groove (TT-TG) distance
- The normal distance: 10 to 15 mm

Instability

- Displacement of the patella results in abnormal shear stresses at the articular surface
- Arthritis: Single dislocation > multiple dislocations
- Higher rate of arthritis surgery group for instability than in patients treated nonoperatively

Maenpaa, Clin Orthop Relat Res 1997

Obesity

- PF joint pressure increases in: climb staircase, gets out of a chair, closed-chain activity
- Obesity predispose to knee pain, knee arthritis, and patellofemoral arthritis

-Cooper, J Rheumatol 1994
-McAlindon, J Rheumatol 1996

Trauma

- Direct blunt trauma lead to degenerative changes in articular cartilage
- Threshold of trauma?
- Traumatic arthritis is suited to isolated patellofemoral procedures
- Trauma was the cause of the arthritis in 20 of 66 patients who were candidates for a patellofemoral arthroplasty.

-Argenson Clin Orthop Relat Res 1995

Fulkerson osteotomy

- Anteromedialization of the tibial tubercle
- Restore normal TT-TG relationship and Q angle
- Unloading distal and lateral damaged cartilage