

Anterior Knee Pain

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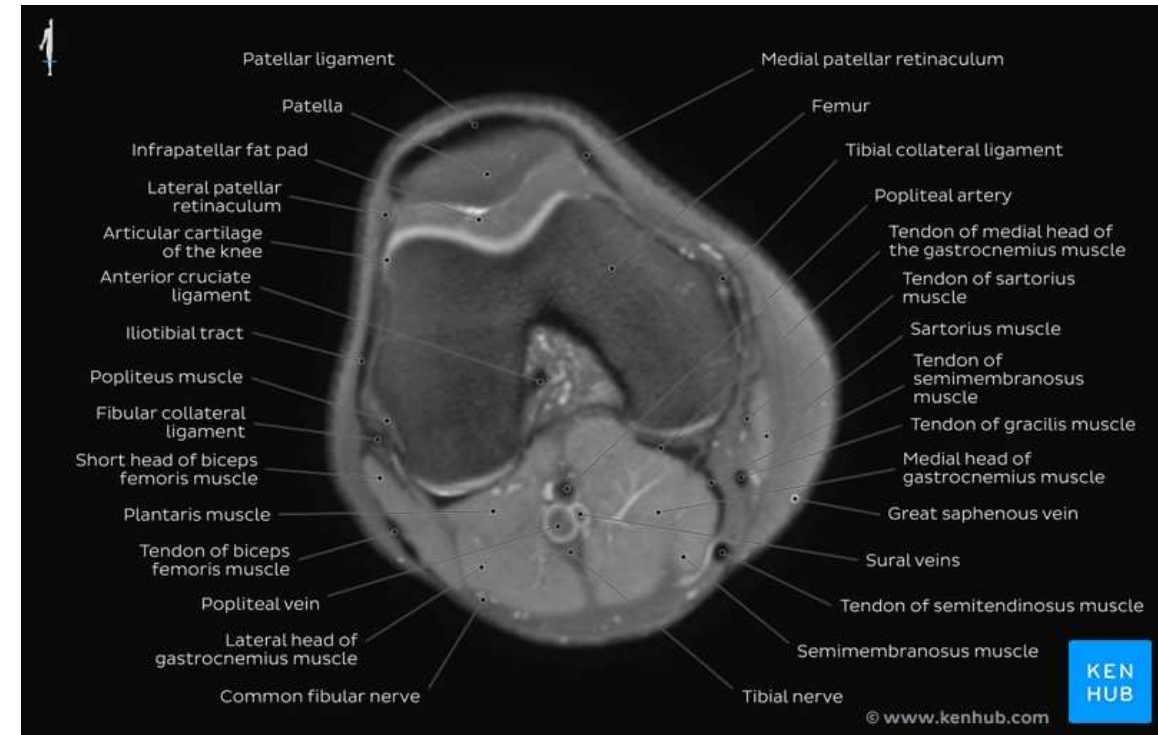
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Banner
Medical Group

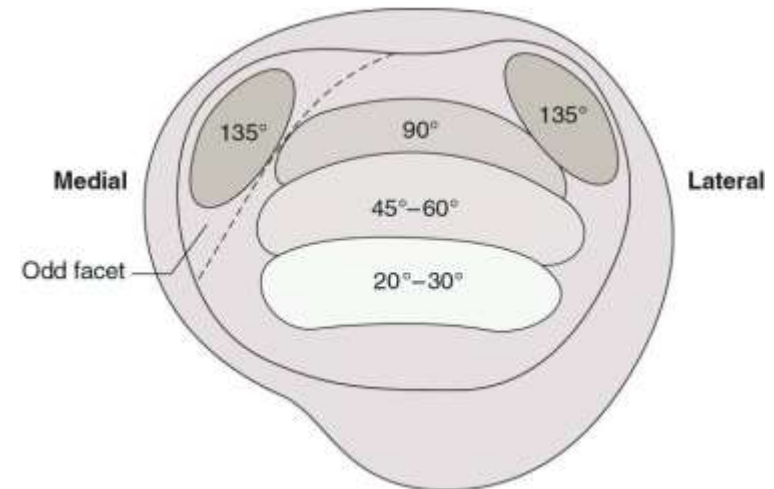
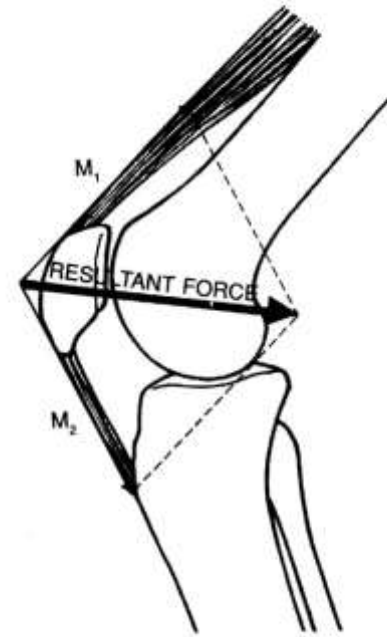
Anterior Knee Pain

- Anatomy
 - Thickest cartilage
 - Medial PFL
 - Prepatellar Bursa
 - Fat Pad
 - Quadriceps and Patellar tendon
 - Retinaculum
 - Trochlear Groove
 - TT- TG distance
 - Q angle



- Biomechanics

- Increase in contact pressures with increasing flexion
- Increase in area of contact with increasing flexion
- Walking = 1/2x body weight
- Running = 5-6 x body weight
- Stairs= 3-4 x body weight
- Squats= 7-8 x body weight



History

- Detailed history is most important portion of exam
- Acute vs Chronic
- Trauma or overuse
- Exacerbating Symptoms
- Pain or Instability
- Common things are common



Anterior Knee Pain

- Common

- Osteoarthritis/Chondromalacia
- Instability/Maltracking
- Bursitis
- Patellar tendonitis
- ITBS
- Osgood Schlatter, Sinding-Larsen-Johansson
- Trauma

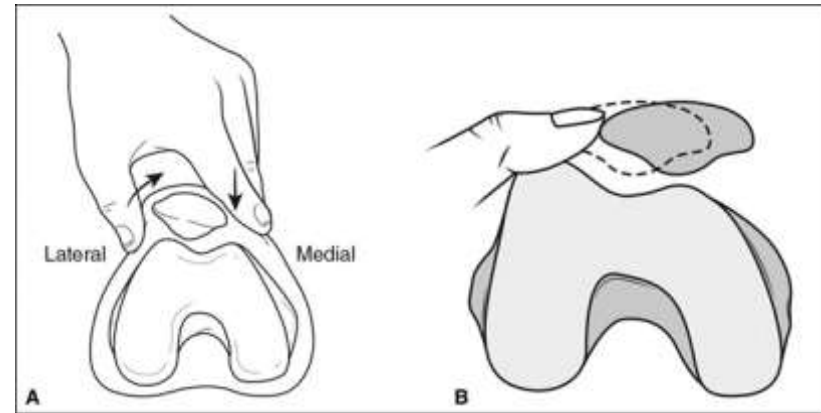
- Uncommon

- Hip pathology
- Plica band
- Tumor
- Radicular pain from spine
- OCD lesions
- Bipatite patella

- Physical Exam
- Findings usually subtle
- Usually no one finding is conclusive
- Static Alignment/Dynamic Alignment
- Foot/Shoe wear



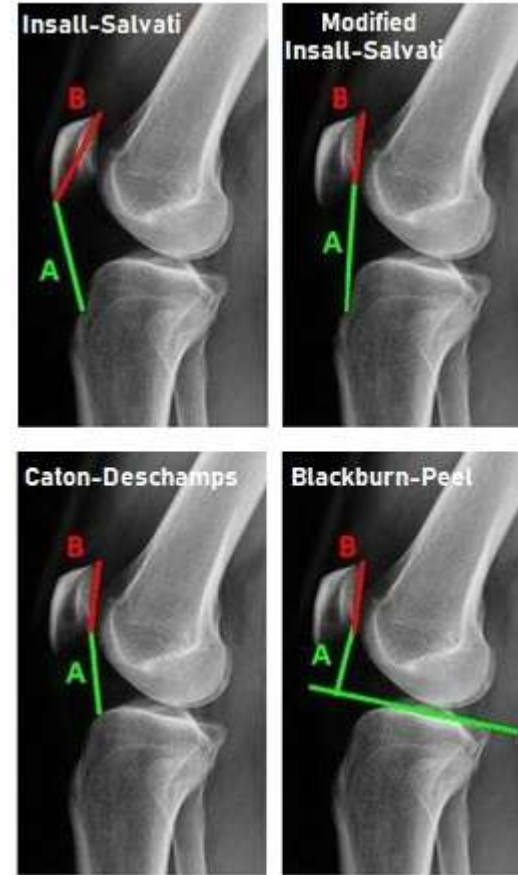
- Seated “J Sign
- Effusion vs Bursitis vs Edema
- Crepitus
- Pain with Palpation
- Patellar Tilt
- Patellar Glide
- Apprehension



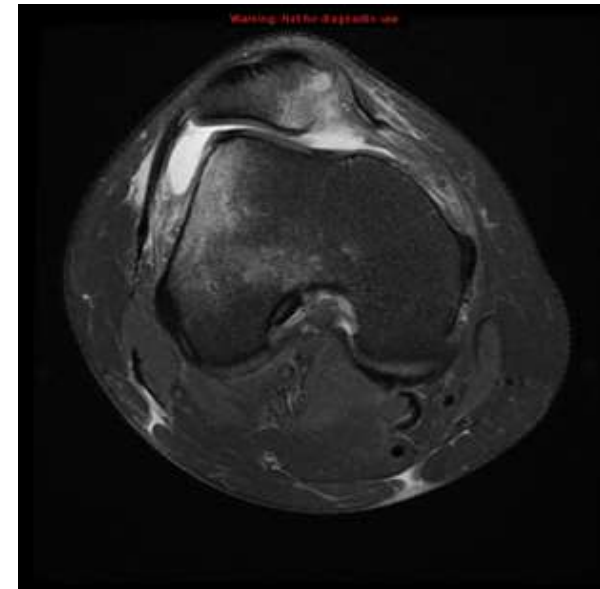
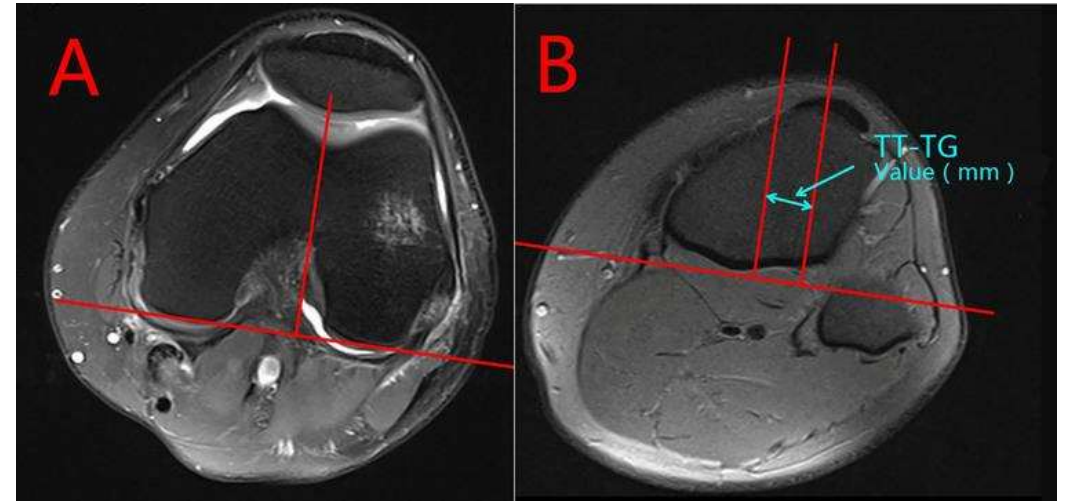
- Hip
- ROM/strength
- Lumbar Spine
- Femoral stretch/Straight Leg raise
- ITB



- Imaging
- Plain Xrays
- Weightbearing AP, weightbearing 45 deg flex view, Lateral, Merchant
- Patellar Height ratio
- Insall-Salvati/Blackburn-Peel/Caton-Deschamps
- Trochlear dysplasia
- Joint space narrowing



- Imaging
- MRI- gold standard
- TT-TG distance(Tibial Tubercle-Trochlear Groove)
- Articular damage
- Subchondral edema
- MPFL
- Patellar/Quad Tendon
- Menisci/other pathology



Patellar Instability

- Dislocations
 - 5.8/100,000
 - Younger age=higher risk
 - Recurrence rates 15-44%
 - Sports/Dance/Trauma
- Subluxation

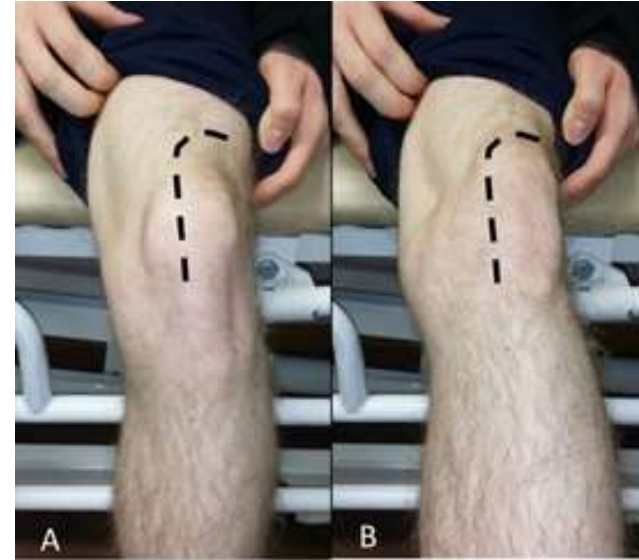


Patellar Instability

- History
- Setting of traumatic dislocation(knee position at the time)
- Previous episode of subluxation or ANP
- Feeling that their “knee dislocated”
- Effusion occurs rapidly with dislocation

Patellar Instability

- Physical Exam
- J sign
- Apprehension test



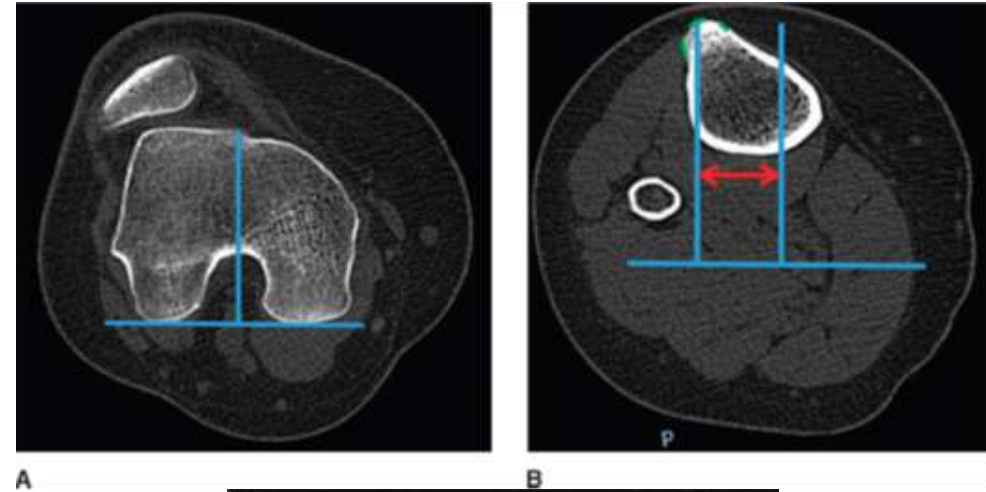
Patellar Instability

- Imaging
- Xray
- Patella Alta, OA, supratrochlear spur



Patellar Instability

- Imaging
- MRI
- TT-TG distance
- Chondral injury
- MPFL injury

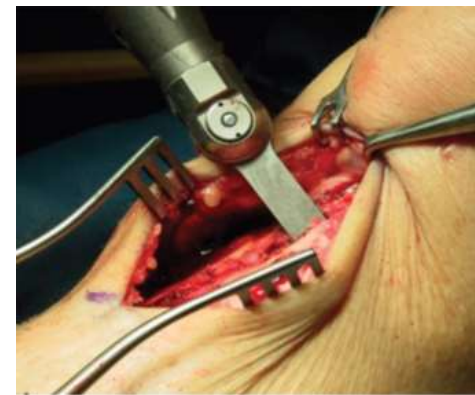


Patellar Instability

- Treatment
- Dislocation= immobilize for 2 wks
 - Physical Therapy
 - Core/Hip strength, ROM, KT taping
 - Place in supportive brace
 - 1st time dislocator- may return to sport 4-6 wks
 - Surgery
 - Recurrent dislocation, osteochondral fracture
 - Continued symptoms of instability after conservative treatment

Patellar Instability

- Surgical Management
- MPFL Reconstruction
- Isolated MPFL recon if:
 - TT-TG distance <15-20
 - No dysplasia or patella alta, NO PF osteoarthritis
- MPFL Recon + Tibial tubercle osteotomy if:
 - Has one/multiple abnormal alignments
 - PF chondral lesion(lateral facet/trochlea)



A



B

Patellar Tendonitis/Tendinopathy

- History
 - Overuse injury/Crossfit/HIT
 - Better with rest-early stages
 - Pain w/ squatting/lunging activities
 - Feeling weakness in knee
- Exam
 - Tenderness over patellar insertion
 - Pain w/decline squat test
 - No effusion



Patellar Tendinopathy

- Imaging
- XR- normal
- MRI-usually unnecessary
- Look for increased thickening and signal in tendon



A



B

Patellar Tendinopathy

- Treatment
 - RICE, NSAIDS
 - PT- eccentric exercises
 - Extracorporeal Shock Wave Therapy(ESWT)
 - PRP
 - Surgery-Tendon Debridement

Osgood-Schlatter

- Overuse traction of patellar tendon on the tibial apophysis
- History
- No trauma
- Usually sports related
- Age 10-15
- Difficult to kneel
- Exam
- TTP, enlarged bump

- Imaging



Sinding-Larsen-Johansson

- Repetitive traction to patella
- History
- Same as OS
- Exam
- TTP at distal pole of patella
- Imaging



OS/SLJ

- Treatment
- RICE, activity modification
- PT
- NSAIDS

Patellofemoral Pain Syndrome

- Diagnosis of exclusion-
- History
- No injury
- Pain with squatting activities
- Movie Sign
- Exam
- Pain with palpation
- Crepitance
- Hyperlaxity

Patellofemoral Pain Syndrome

- Imaging
 - Xray- r/o previously mentioned alignment problems
 - MRI- TT-TG distance, chondral damage
 - Only obtain after failed course of conservative tx(PT)
- Treatment
 - PT- core/hip/leg strengthening
 - NSAIDS/Bracing/KT taping
 - Surgery- diagnostic arthroscopy- look for chondromalacia/Plica band/chondral damage

Patellofemoral Cartilage Lesions

- Difficult problem to treat
- History
- Pain w/squatting/kneeling/stairs
- Exam
- Gait
- Look for signs of instability/tracking
- Hip/Foot
- Crepitance

Patellofemoral Cartilage Lesions

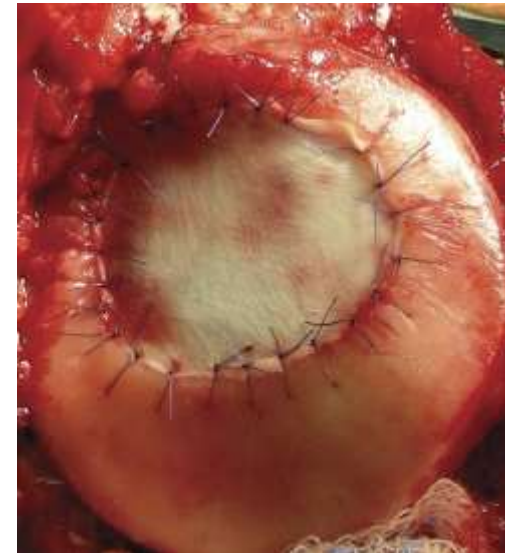
- Imaging
- Xray
- Compare Sunrise views/lateral(for dysplasia)
- MRI(3T)
- TT-TG
- Subchondral edema
- Chondral defects
- MPFL attenuation

Patellofemoral Cartilage Lesions

- Treatment
 - Nonsurgical
 - PT-capsular stretching, core/hip/vastus medialis strengthening
 - NSAIDS/activity modification
- Surgical Treatment
 - Arthroscopic debridement

Patellofemoral Cartilage Lesions

- Surgical Treatment
- Microfracture-avoid
- Autologous Chondrocyte Implantation(ACI)
- Large defects >3-4cm trochlear groove
- 2 stage technique



Patellofemoral Cartilage Lesions

- Osteochondral Autograft Transfer(OAT)
 - Smaller defects <2cm



- Osteochondral Allograft Transfer
 - Large/Irregular Defects >2 cm
 - Abnormal subchondral bone
 - Bipolar lesions

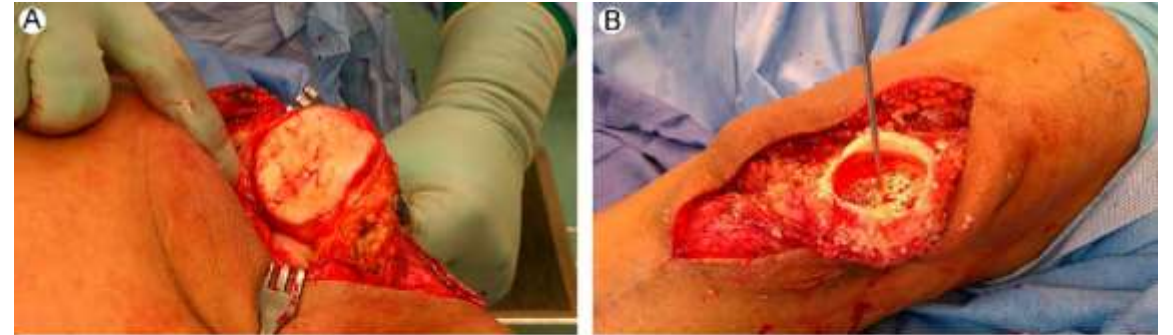


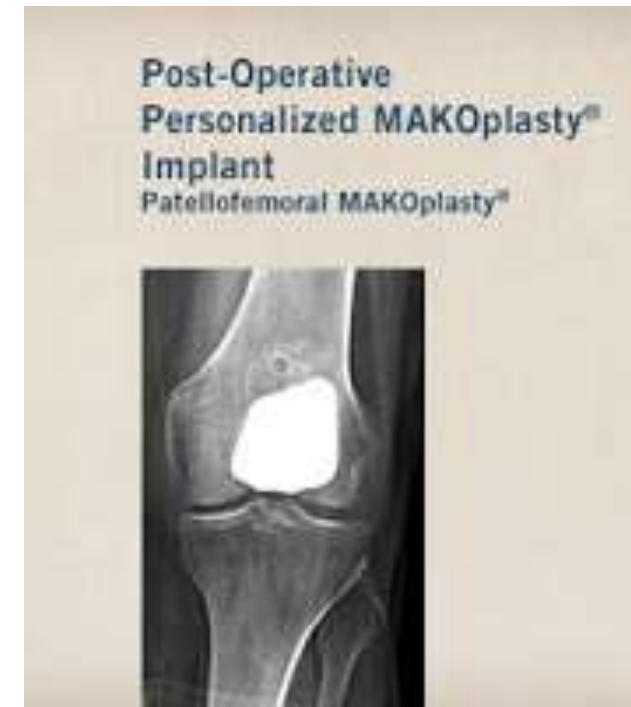
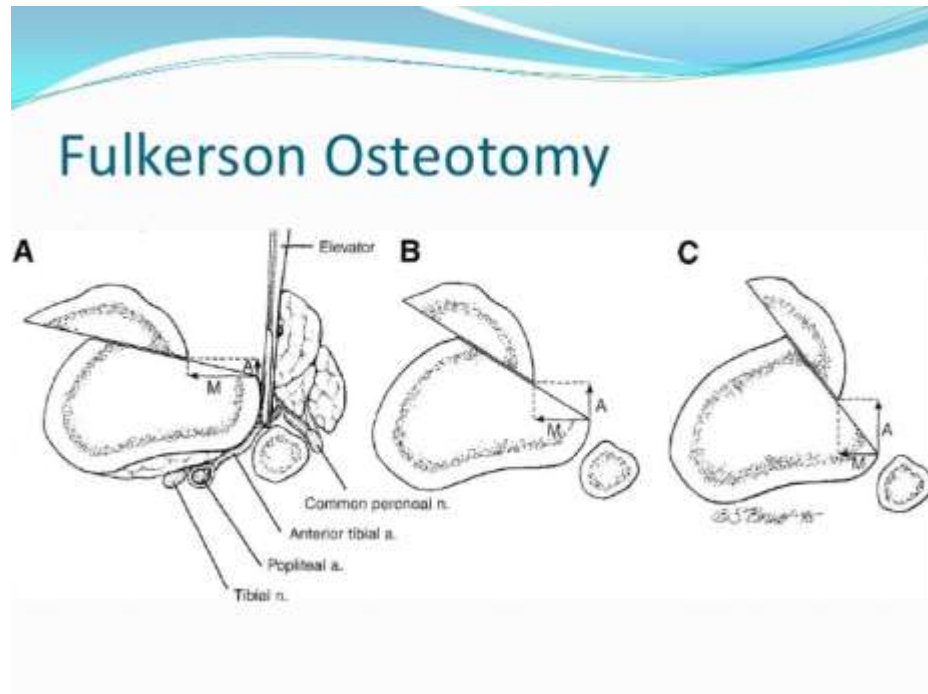
Table 1**Cartilage Restoration Techniques for Patients With High-Grade Patellofemoral Chondrosis**

Technique	Indications	Contraindications	Technical Pearls
Chondroplasty/débridement	Unstable chondral flaps with mechanical symptoms Incidental finding	Large areas of chondrosis Bipolar lesions	Creation of stable walls if practical
Microfracture	Trochlear lesions <2 cm ² Lower demand patients	Larger lesions Uncontained lesions Bipolar lesions Patellar lesions BMI >35	Creation of stable vertical walls Removal of calcified layer Preservation of bone bridge at least 2–3 mm between holes
Osteochondral autograft transfer	Trochlear or patellar lesions <2 cm ²	Larger lesions Uncontained lesions	Perpendicular placement of plugs Avoid excessive force when seating plugs Avoid harvesting plugs from ipsilateral side of trochlea
Autologous chondrocyte implantation	Trochlear or patellar lesions >3–4 cm ² Off-label in United States for patellar lesions	Uncontained lesions BMI >35	Avoid damage to subchondral plate
Fresh osteochondral allograft transplantation	Salvage procedure for younger patients who have arthritis and/or in whom restoration procedures failed Trochlear or patellar lesions Technically challenging	Inadequate patellar thickness Advanced arthritis	Morphologic- and size-matched fresh allograft Minimize graft thickness The larger the bony portion, the more likely the patient will become antibody positive

Patellofemoral Cartilage Lesions

- Tibial tubercle osteotomy
 - Lateral facet lesions

- Patellofemoral Arthroplasty
 - Traumatic OA, dysplastic
 - Isolated diffuse OA, pts under 40



Summary

- Difficult Diagnosis
- Difficult Treatment
- Multifactorial etiology
- Second opinions

References

- Upon request