

Patellofemoral Instability Surgery Complications: How to Recognize and Avoid Them

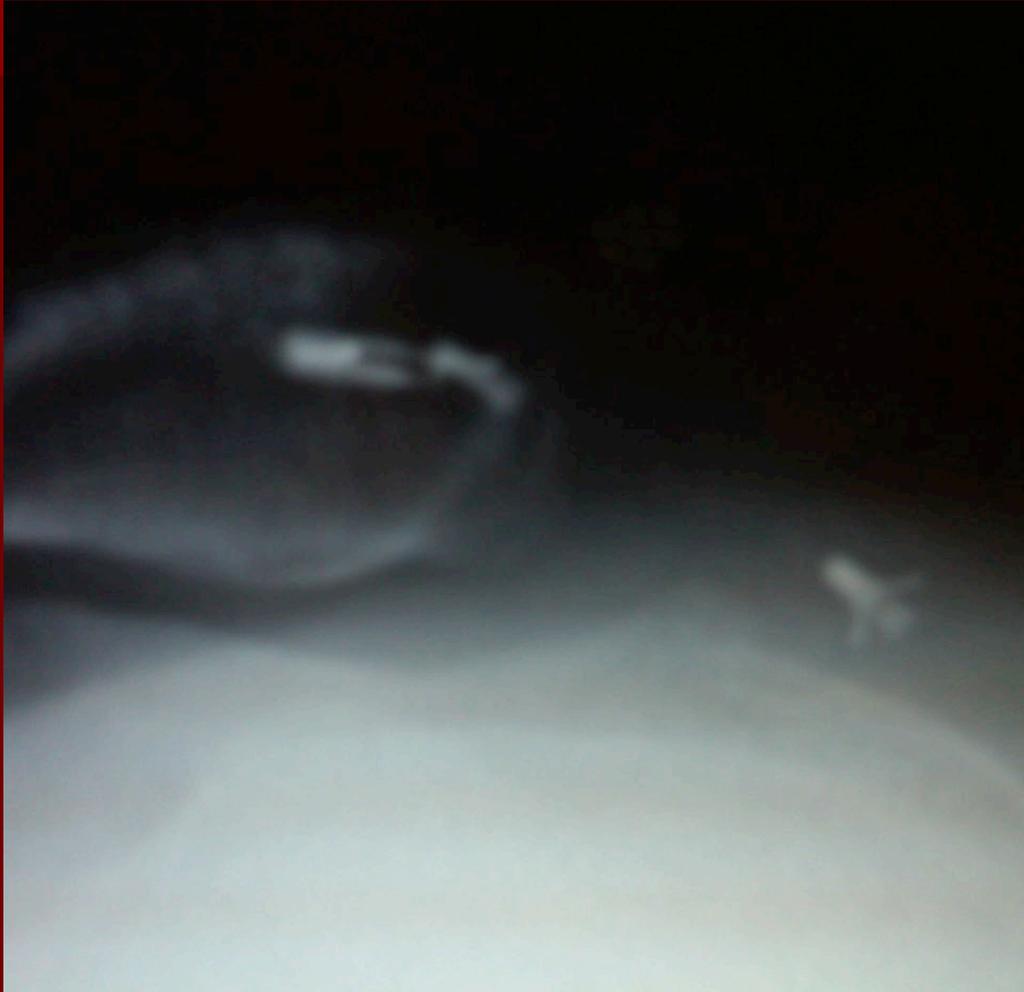
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Failure of Non Isometric graft fixation



- Failure to centralize patella tracking by tibial tubercle transfer prior to MPFL reconstruction
- Revision required: medial tibial tubercle transfer and revision to MQTFL reconstruction

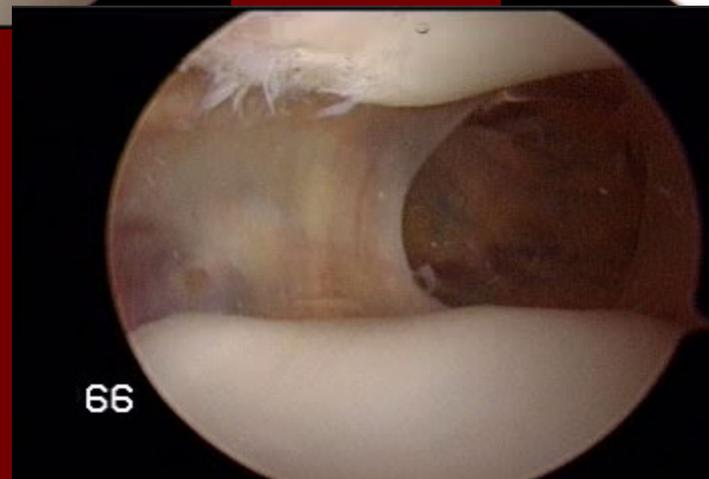
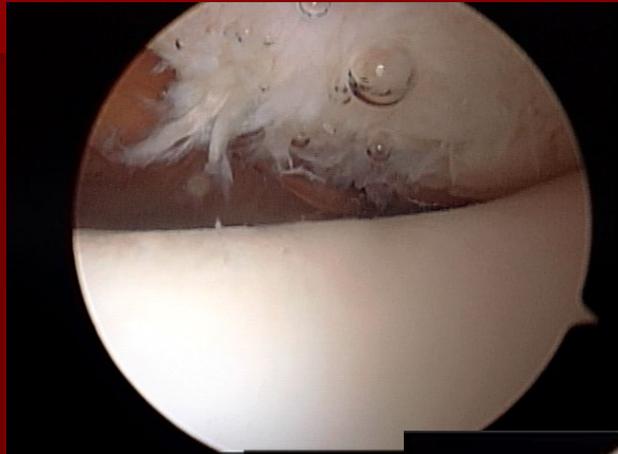
Failure of proximal stabilization

- 1. Failure to establish **O**ptimal, balanced tracking. Often, this requires compensatory medial or anteromedial tibial tubercle transfer to establish central patella tracking before revision medial PF reconstruction.
- 2. **Failure to Restore anatomic medial Retinacular support (MPFL, MQTFL, MPFC)**. Some failures of PF stabilization are a result of an inaccurate or insufficient medial reconstruction (imbrication in the face of lateral tracking or Dejour grade B-D trochlea dysplasia) **Tendon graft far superior to imbrication**, but get tracking balanced first.
- 3. Reassess trochlea. If it is flat, the burden is on the surgeon to establish optimal tracking and optimal medial graft placement. Trochleoplasty for severe dysplasia

Trochlea factors

- Most patients with trochlear dysplasia and recurrent patella instability do not need a trochleoplasty
- Reasons to consider trochleoplasty center mostly on prominent J sign combined with patella alta (< 5% of RIP patients)
- Long term joint preservation is NOT a reason to do trochleoplasty- no evidence to support this and in fact, trochleoplasty may increase risk of later arthrosis of the PFJ

Trochlea Dysplasia Dejour A and B



Healthy trochlear cartilage- Must Optimize both tracking and retinacular stability.
In face of lateral tracking vector and cartilage damage- may require AMZ

KEY POINT:

The dysplastic trochlea is CONGRUOUS with its articulating patella. Therefore, trochleoplasty likely creates incongruity. We do not know if this trade off of added stability for incongruity improves joint preservation

If stability can be achieved while maintaining congruity, this is preferred and less likely to accelerate later articular breakdown



Regarding trochlea and complications

- Trochleoplasty known to increase risk of post operative stiffness
- Unknown long term consequences
- Rarely needed

- Best way to avoid complications of trochleoplasty is not to do one without special training and only for very selected patients who will not do well without one (<5%)

Medial patella instability

- Almost always iatrogenic- excessive lateral release/TTT
- **Often missed !!!!!**
- Dramatic and painful to the patient
- Elusive to the examiner
- Patient is **worse** after surgery designed to add stability, so surgeon becomes confused
- Sudden giving way, **often normal axial radiograph**
- **This is a functional problem**
- You must think of it and know how to elicit the diagnosis or you will miss it
- **Patient often feels patella going LATERALLY, because it is going laterally** from too far medial back to the trochlea! **PEARL**

Medial subluxation test



- Push patella medially, knee extended (simulates the medial “drift” of medial tracking patella)
- Flex abruptly and let go of the patella
- If positive, the patient experiences the SAME FEELING that has been disabling-dramatic!!
- Easy to diagnose if you know how
- Easy to miss!!!!

Fulkerson J. A Clinical Test for Medial Patella Tracking (Medial Subluxation). Techniques in Orthopaedics 12(3):165-169, 1997.

Controlling medial subluxation

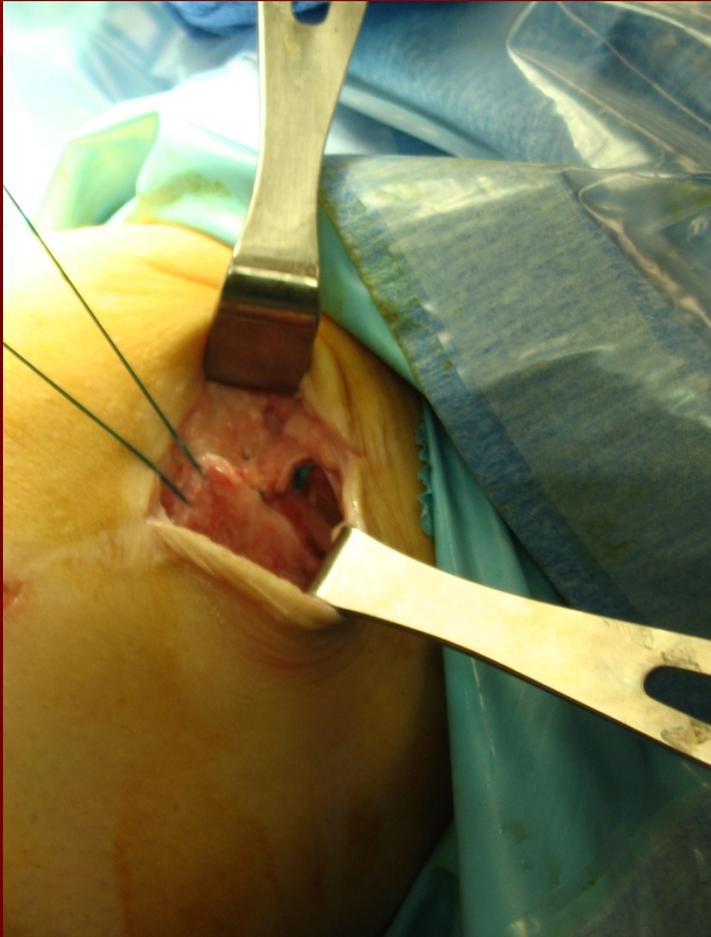
- Patella is braced to prevent medial drift
- Pull is directed laterally
- If this controls the symptom, the diagnosis is set
- In most cases, a lateral reconstruction or even revision tibial tubercle transfer (lateralization) becomes necessary, as this is a very disabling condition



Medial and lateral patella instability

- Grossly unstable and chronic pain. Patient experiences patella instability yet often no clear evidence of abnormal patella tracking. Often in association with trochlea dysplasia-----FUNCTIONAL PROBLEM.
- Almost always iatrogenic--- related to excessive releasing or too much medial TTT/imbrication/MPFL reconstruction. Most patients will require medial and lateral proximal reconstruction- This usually works out well. Medial subluxation is typically more disabling-
CORRECT THIS FIRST!!!!
- Important not to overdue any imbrication, medial reconstruction, lateral release or TTT
- Possible indication for trochleoplasty in selected cases

Repair lateral retinaculum for recurrent medial subluxation



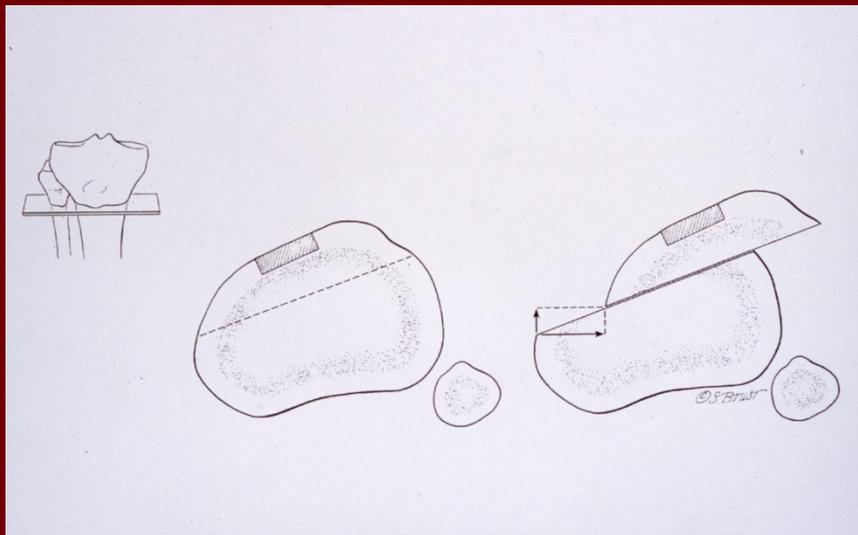
usually add tendon allograft or lateral 7 mm patellar tendon or strip of ITB based on patella and woven through IT band to supplement- do not overdo!

Easy to miss medial subluxation

You may not have seen it, but it
may have seen you (Hughston)

This is a functional problem. You must elicit it by provocative testing. Remember--- they have very sudden giving way after previous PF surgery, and feel the patella going lateral (from too far medial back into the trochlea). Patients will love you if you find and correct it

Anterolateral Tibial Tubercle Transfer



- Salvage for previous posteromedial TTT (Hauser) with medial patella breakdown and/or medial subluxation

**Fulkerson, John P.
Anterolateralization of the
Tibial Tubercle. *Techniques
in Orthopaedics* 12(3):165-
169, 1997.**

Failed previous surgery because of lateral PF arthrosis

- Stabilizing surgery that neglects PF arthrosis will often fail because of pain
- Unload and align patella

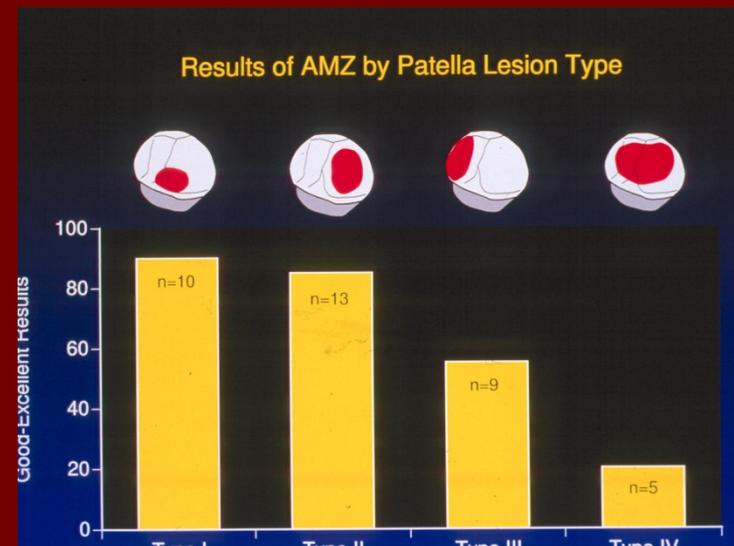
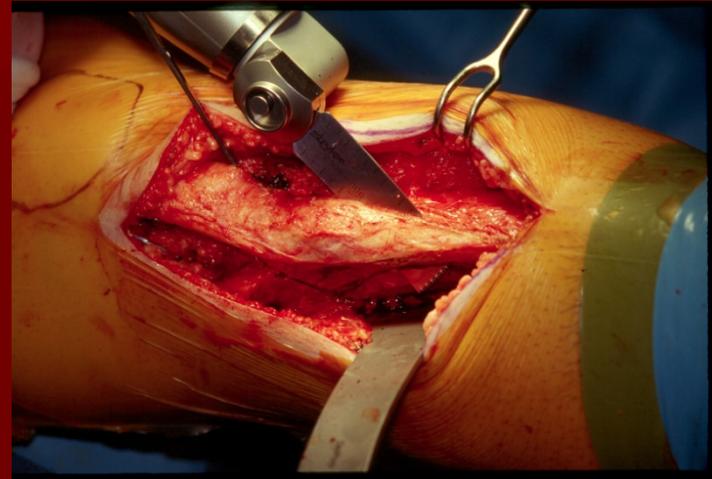
Lateral patella articular breakdown from chronic lateral tracking/dysplasia



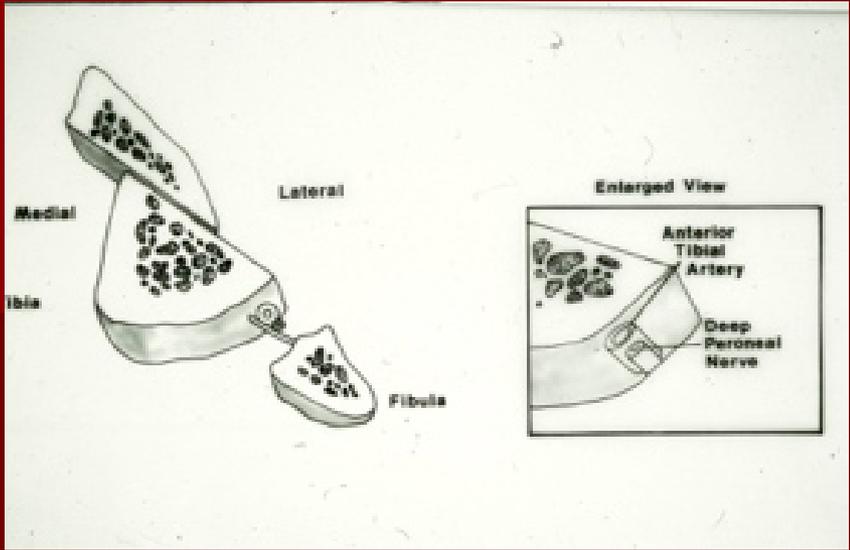
- Must unload
- PF Replacement option in older patients
- Anteromedial TTT preferable in <45 year old as long as there is intact medial cartilage

Anteromedial tibial tubercle transfer for salvage of neglected lateral or distal patella articular lesion(s)

- Best alternative to unload and realign the extensor mechanism when there is excessive lateral pressure syndrome, even with extensive lateral facet breakdown
- Very effective for unloading a painful grade 4 distal or lateral articular lesion



AMZ



with lateral facet overload, but by 20° of knee flexion, every patella engaged the trochlea with some redistribution of contact pressure onto the medial facets. Pressures on the lateral facets remained greater up to 60° of knee flexion, simulating patellar lateralization.

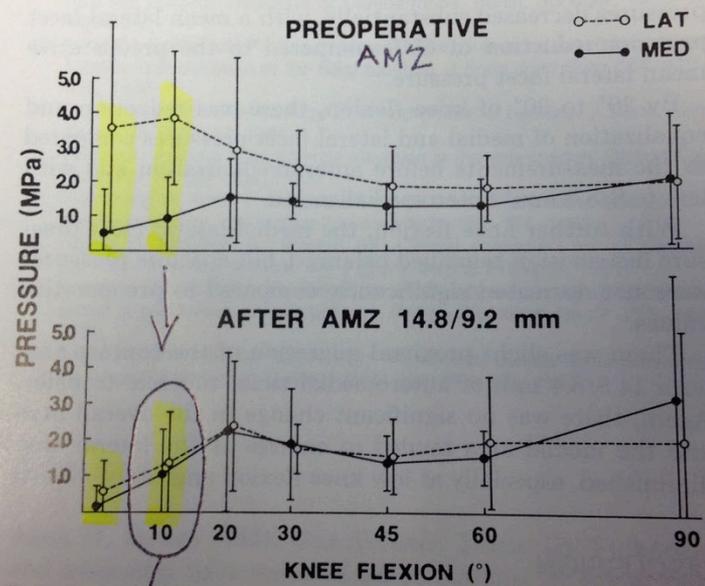
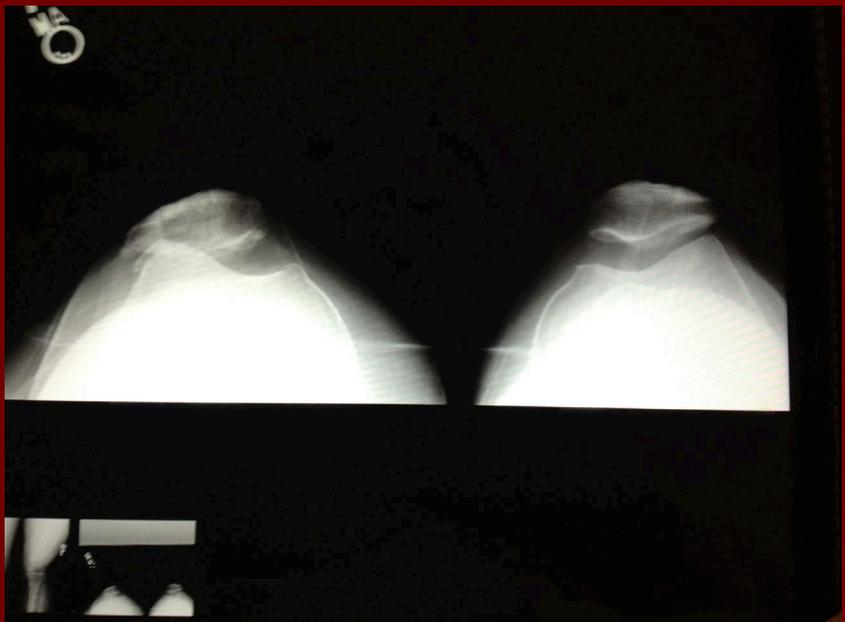


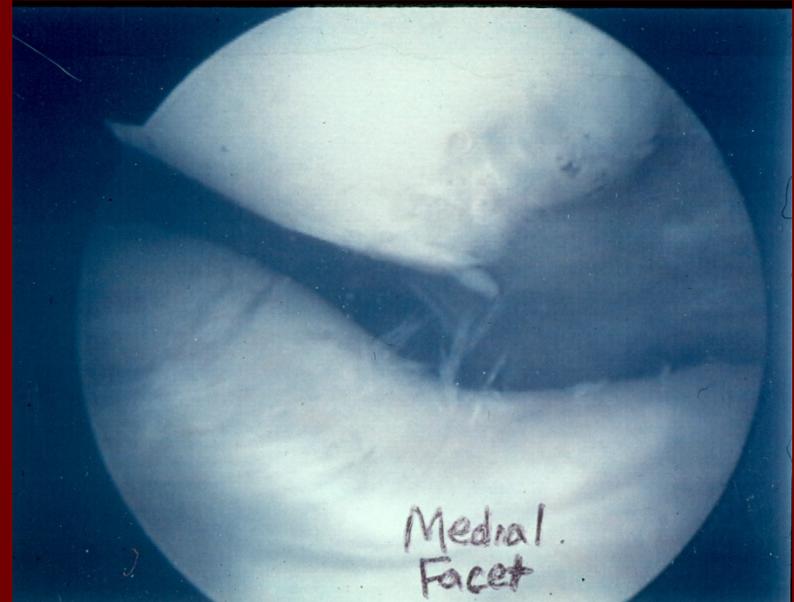
Figure 3. Graph representation of patellofemoral contact pressures before and after anteromedial tibial tubercle shift in cadaver knees.

Note much reduced net contact pressure distal pole at 10°



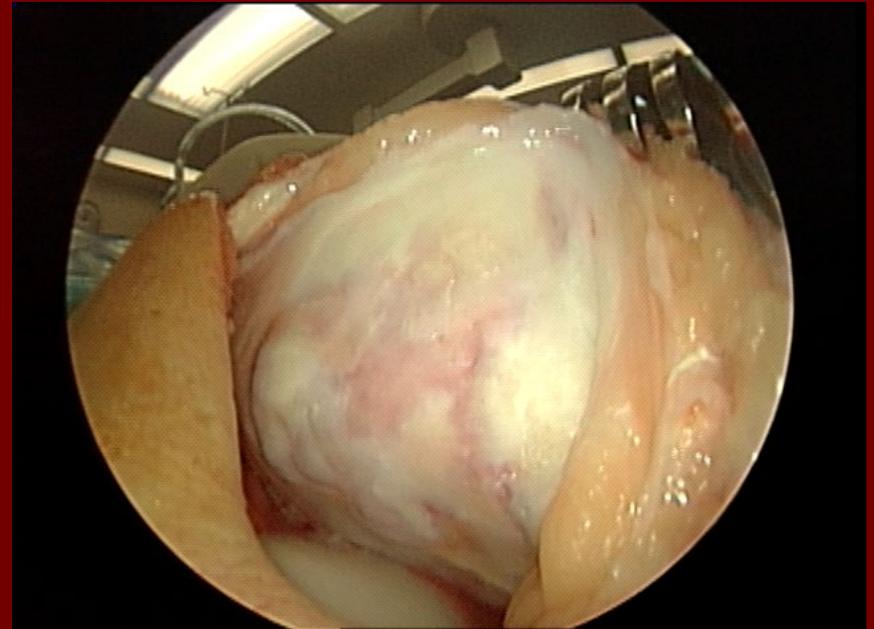
Failed surgery because of pain from a medial facet lesion

- May require osteochondral resurfacing
- Do not add load with medial imbrication or MPFL reconstruction
- **Offload** by anteriorization, balancing and resurfacing as needed



Failed surgery because of Diffuse PF Articular Damage

- Anteriorizing procedures do not work in such patients
- Allograft replacement may be appropriate in some patients too young for metal and plastic (Deberardino, Farr)
- PF arthroplasty for diffuse patella and trochlea degeneration in older pts
- Total knee replacement in older patient with other compartments involved or when there is severe trochlea dysplasia



Non surgical Treatment of Complex Chronic PF pain

- Poorly responsive worker's comp patient
- Diffuse ill defined pain
- Hyperesthesia
- RSD
- Type A “can't deal with this” patient
- Inadequately rehabilitated patient
- WEIGHT LOSS!!!!
- Rest/discontinue PT- Restore to envelope of load acceptance (Dye)

First Case

- 16 y/o female with Ehlers-Danlos
- first patella dislocation in 2006.
- Lateral release, tibial tubercle transfer and MPFL reconstruction
- Stable 2 years
- Then recurrent dislocation in 2008. Patient referred for revision.
- Exam showing medial and lateral patella instability.

Non anatomic MPFL reconstruction

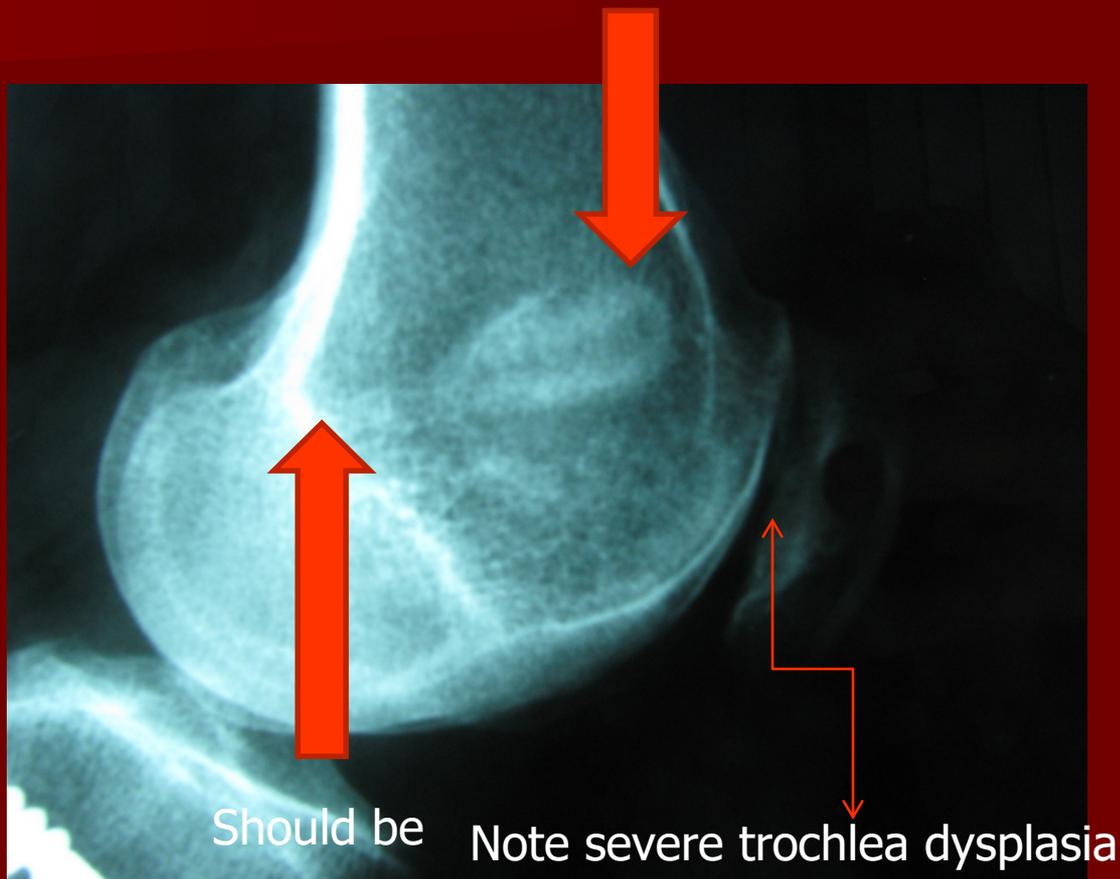
Non anatomic MPFL graft failed and lateral side incompetent (from extensive lateral release)

Result: medial and lateral instability and PF arthrosis

2/2009- arthroscopy showed severe damage to medial patella from overload

Lateral repair was done to control incapacitating **medial** patella instability. Patient became less debilitated but continued to have pain from the medial patella lesion, as well as lateral instability

5/2010- MPFL anatomic reconstruction revision to proper femoral fixation site yielded a stable knee

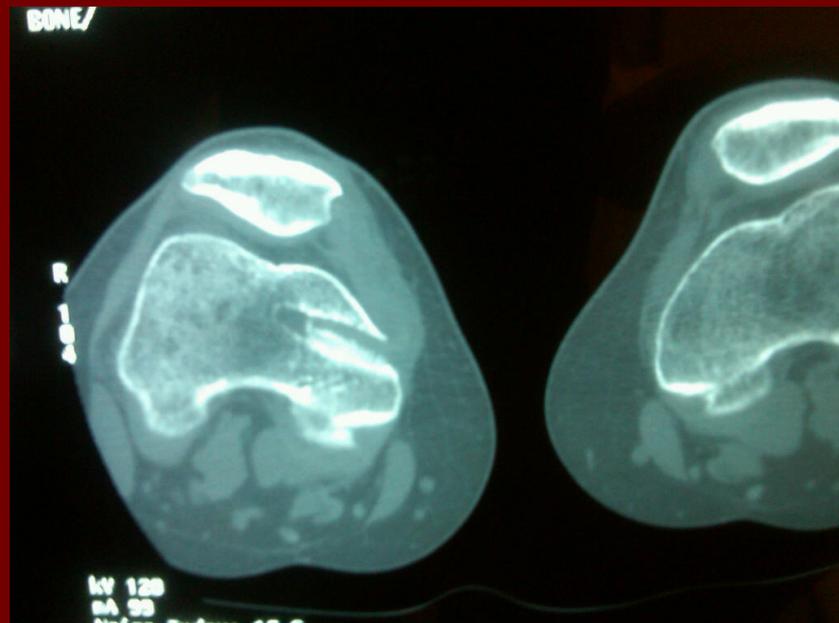
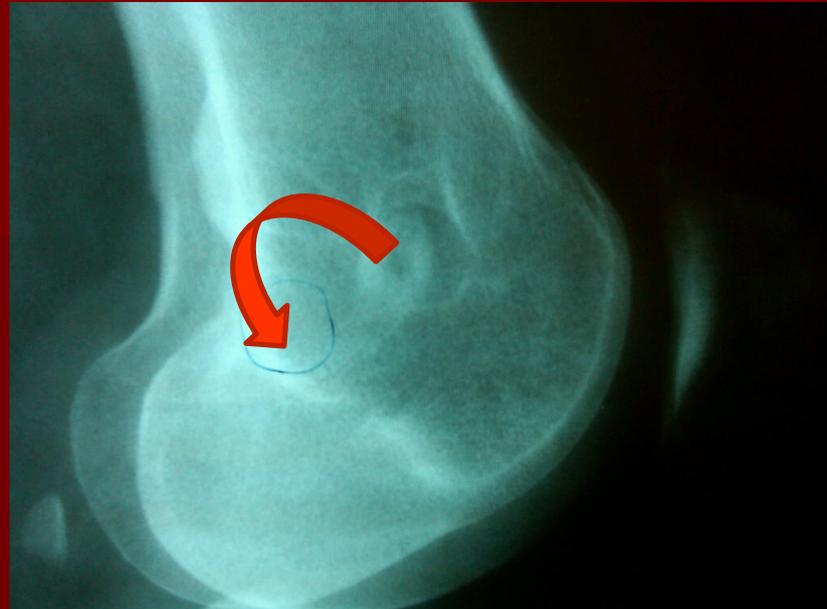


Another Revision case- inaccurate MPFL reconstruction

Referred in July 2010 for revision because of severe recurrent instability

Had failed lateral release and MPFLR with tendon graft , becoming much worse, with frequent medial subluxations and tipping of patella proximally upon flexion of the knee

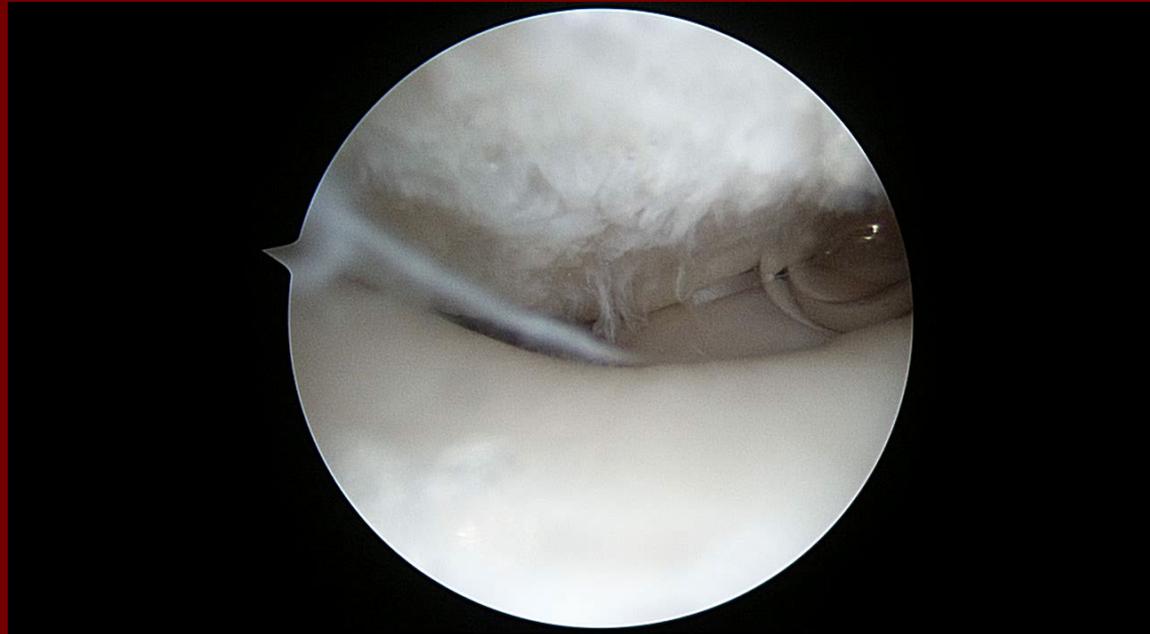
MPFL graft released, lateral side stabilized (closure of proximal lateral release) in July, 2010



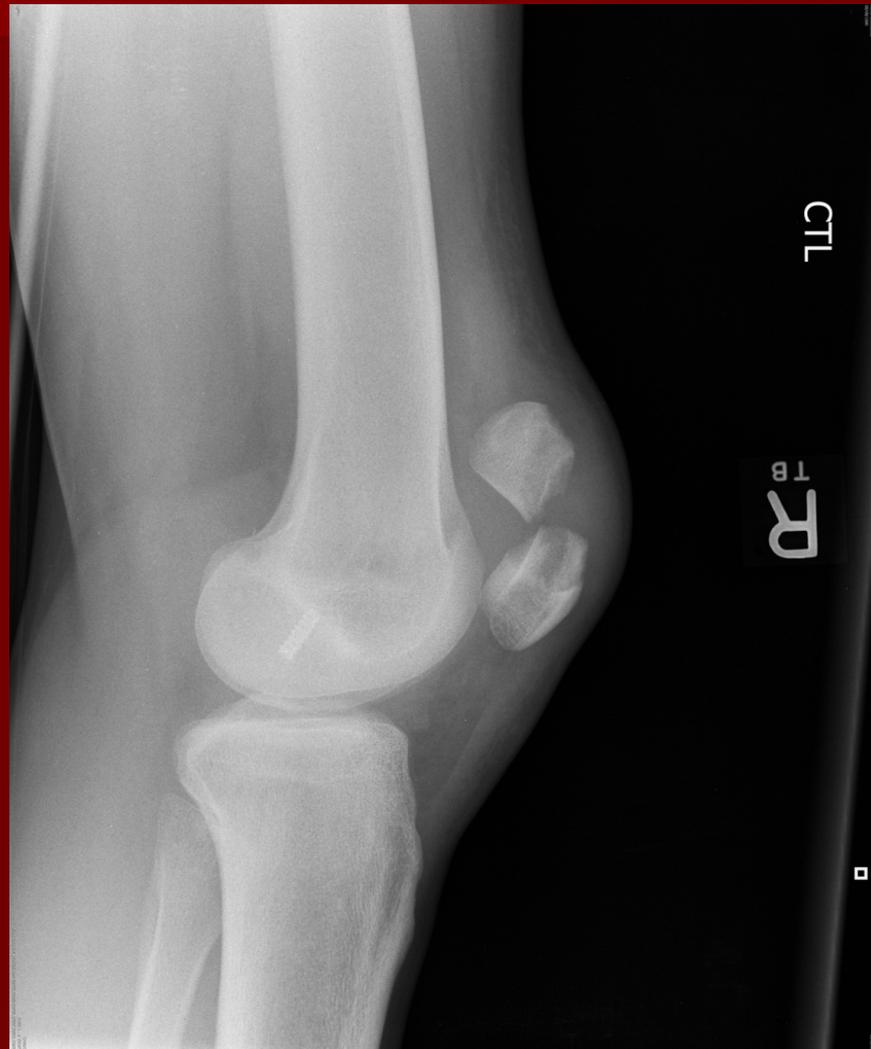


before revision-inaccurate MPFL graft placement caused severe articular overload and destruction medially

**after MPFL
graft release
and lateral
repair**



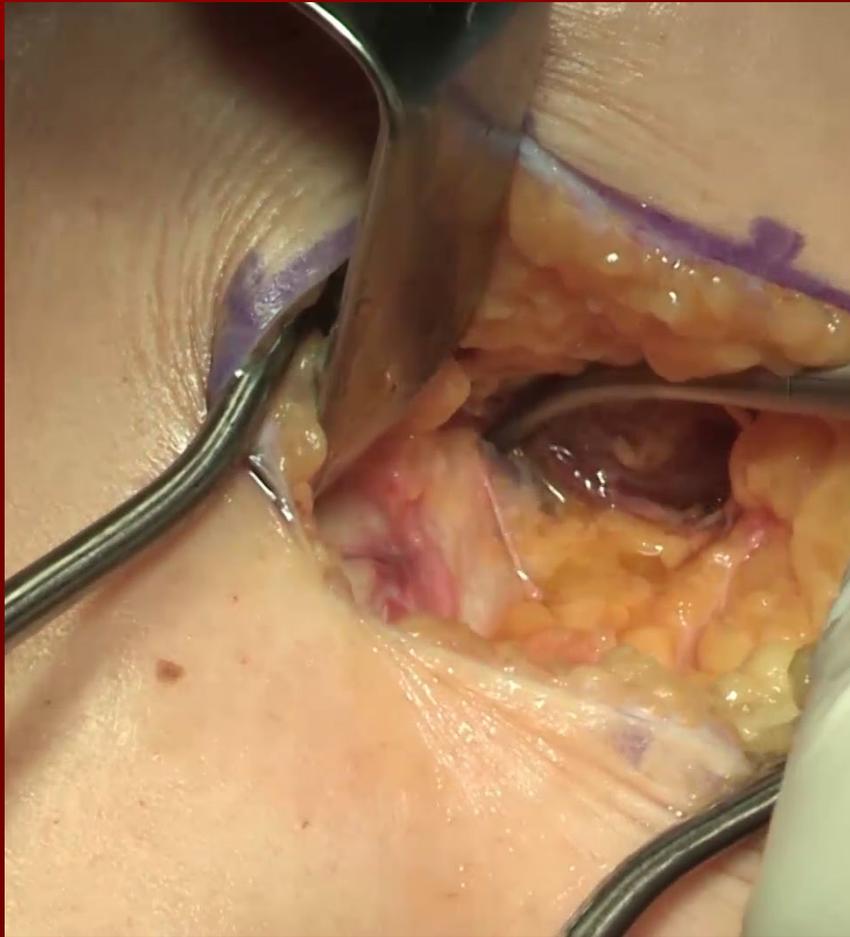
Patella Fracture after MPFL Reconstruction



Avoid patella fracture by using MQTFL Reconstruction



Precise femoral side fixation

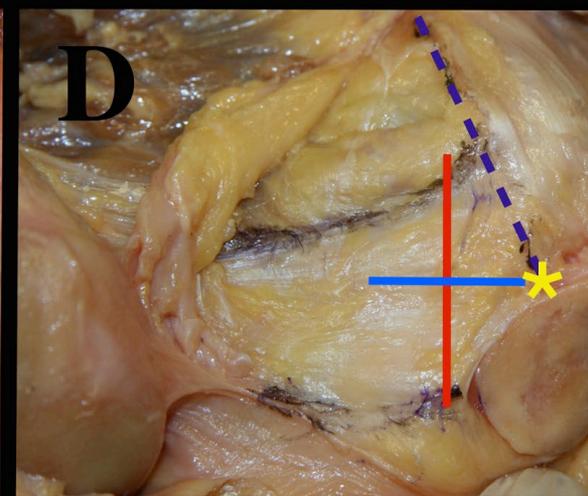
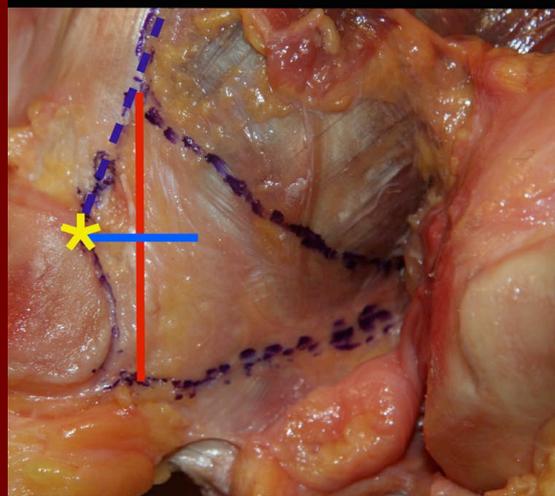
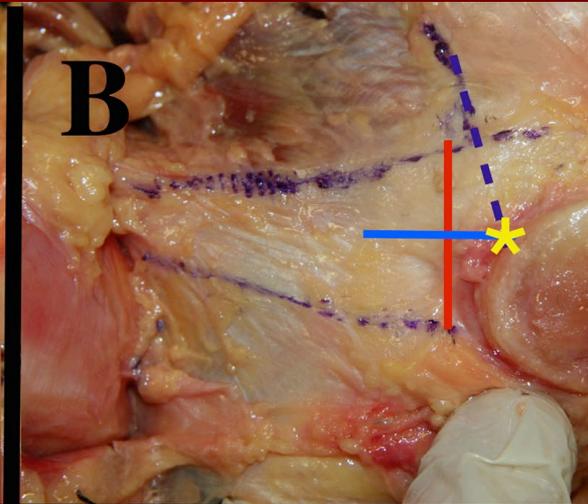
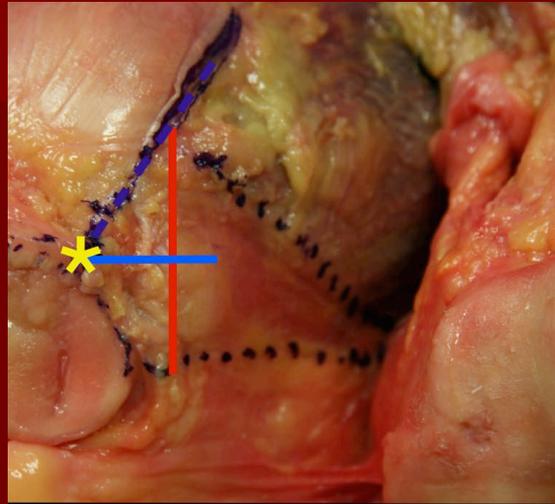


- Find the adductor tubercle using precise exposure, C arm or whatever you need
- Make incision as large as needed
- Place graft at precise distal end of adductor tubercle

Reconstruct the quad tendon-femoral ligament to avoid risk of patella fracture

Note primary medial restraint goes to quad tendon above patella (Medial quad tendon-femoral ligament Mochizuki) as well as to patella (Tanaka)

Note median insertion point is at junction of patella and quadriceps tendon (Tanaka)



The MPFL is a ~ 200 Newton ligament (Amis) that functions only to gently draw the patella into the central trochlea in early knee flexion, then the trochlea becomes deeper and is the primary restraint to prevent lateral patella translation

Anatomic to bring the graft up under the VMO and through the VMO tendon suturing it into the distal quad tendon

Suture in place at maximum length

The MPFL normally interdigitates with the VMO tendon and is normally inseparable from it.

AVOID PATELLA FRACTURE



My recommendations for avoiding Medial PF Reconstruction Complications

1. Precise anatomic graft placement in all cases
2. Do not overtension. Better a little loose than too tight. Fix graft at maximum length- reproducing normal tracking- never medial
3. MQTFL Reconstruction or avoid transpatella drilling

Conclusions

- Accurate decision-making in every patient is your primary guide to successful surgery without complication
- **Optimize articular loads and Be sure to address articular lesions by unloading when appropriate**
- Avoid medial subluxation
- Identify and treat iatrogenic medial subluxation as well as combined medial and lateral instabilities
- Recognize and unload painful excessive distal and lateral pressure by anteromedial TTO
- **Precise medial PF stabilization.** Consider MQTFL reconstruction. Use anatomy to guide you. Know it!
- Optimize balance and loading onto healthy cartilage

Thank you!



www.Patellofemoral.org

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