Thin Flap Trochleoplasty with Medial Patellofemoral Ligament Reconstruction for Recurrent Patellofemoral Instability with High-Grade Trochlear Dysplasia
A Series of 63 Consecutive Cases

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Disclosures

- Disclosures for LAH can be viewed on ISAKOS website
- There are no disclosures for the other authors, nor are there any specific to this research.

Rationale for Trochleoplasty

- Recurrent LPI with high-grade trochlear dysplasia has poor outcomes with isolated MPFL-R

- Trochlear dysplasia is present in 68–85% of recurrent cases (vs. 3–6% of controls)

- Trochlear bump >5mm correlates with ⬆ surgical failure

- Thin flap technique addresses bony architecture & stability

Surgical Indications

- Dejour B or D trochlear dysplasia with recurrent LPI
- Significant J-sign (grade 3–4 or bayonet-shaped)
- Trochlear bump ≥5 mm on true lateral radiographs
- Failed prior soft tissue procedures (± MPFL-R)

Surgical Technique

- Lateral parapatellar arthrotomy with Z-lengthening
- Osteochondral flap raised & thinned for malleability
- Groove deepened with burr & realigned with femoral notch
- Flap fixed with SmartNail™ implants
- MPFL-R with gracilis autograft
- ± TTO based on CDI or TT-PCL criteria

Surgical Technique
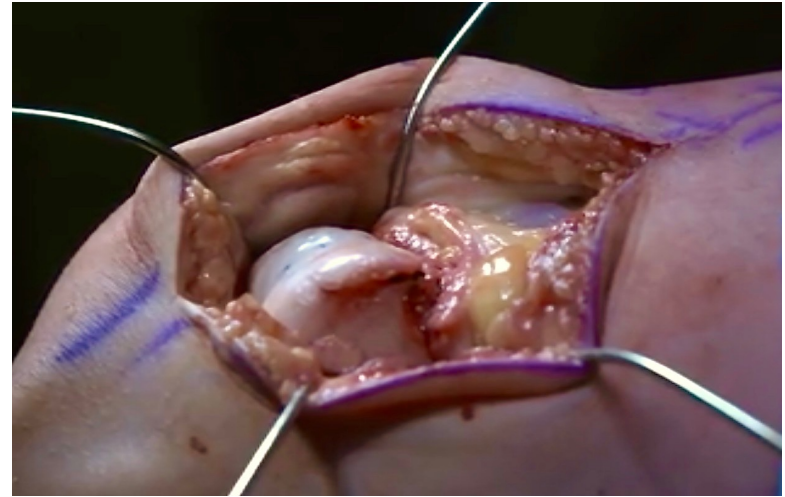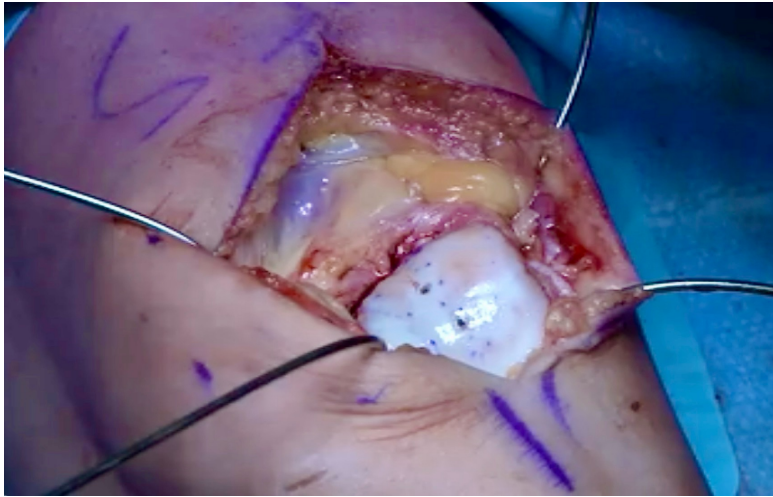
Patient Cohort

- 63 knees in 46 patients (17 bilateral)

- Mean age: 22 years; 80% female

- Beighton ≥4 in 65% (generalised joint hypermobility)

- Dejour B: 46%, Dejour D: 54%

- Mean trochlear bump: 6.1 mm

- Mean follow-up 32.9 months

Clinical Outcomes

- Patient-reported quality of life, BPII 2.0 score improved from $29.3 \pm 12.4 \rightarrow 71.8 \pm 17.4$ (P < .001)
  - Cohen's d = 2.41 (large effect size)
  - No floor or ceiling effects detected in BPII 2.0
  - Indicates strong content validity of BPII 2.0 for this population
- Knee ROM in all patients ≥135°

Clinical Outcomes

- Redislocation: 1 case (1.6%)
    - Femoral malrotation
- Reoperations: 3 knees (4.8%)
    - Infection, hypertrophic cartilage, and arthrofibrosis
- Persistent J-sign: 13.6% (mild); Apprehension: 8.5%
- No cartilage delamination observed

Exploratory Regression Analysis

- 24-month BPII 2.0 score was not predicted by:
  - Pre-op BPII, trochlear bump height, rotational malalignment, or Beighton score
  - $R^2 = 0.22$; $P = 0.13$

- Interpretation: anatomical correction trumps isolated risk factor weighting

- Suggests multivariate inputs are insufficient alone to predict outcome

Discussion

- Meta-analyses show redislocation rates 0 - 27%; reoperation rate is highly variable & poorly defined

- Present series: redislocation 1.6%, reoperation 4.8%

- Adds to limited North American data on trochleoplasty

- Supports thin flap technique as safe and reproducible for persistent instability and high-grade dysplasia in tertiary practice

Pearls

- Meticulous groove placement is critical
- Uniformly thin trochlear flap to allow moulding without fracture
- Confirm patellar tracking & MPFL graft isometry intra-op
- Avoid over-tensioning MPFL in hypermobile patients
- Low complication rate even in high-risk, complex dysplasia
- Technique reproducible with defined indications

Publication

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