

Suture-Based Repair with Debridement and Bone Grafting of Unstable Knee Osteochondritis Dissecans

S. Clifton Willimon, MD

Anthony C. Egger, MD

Michael T. Busch, MD

Crystal A. Perkins, MD



Disclosures

- S. Clifton Willimon, MD
 - Smith & Nephew endoscopy: consultant
 - Vericel: consultant
- Anthony C. Egger, MD
 - None
- Michael T. Busch, MD
 - None
- Crystal A. Perkins, MD
 - None

Background

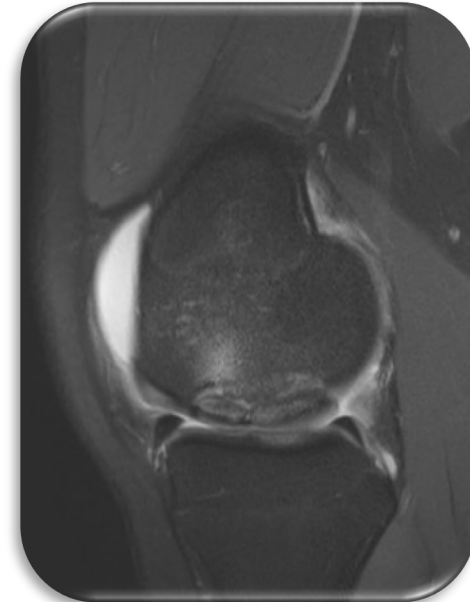
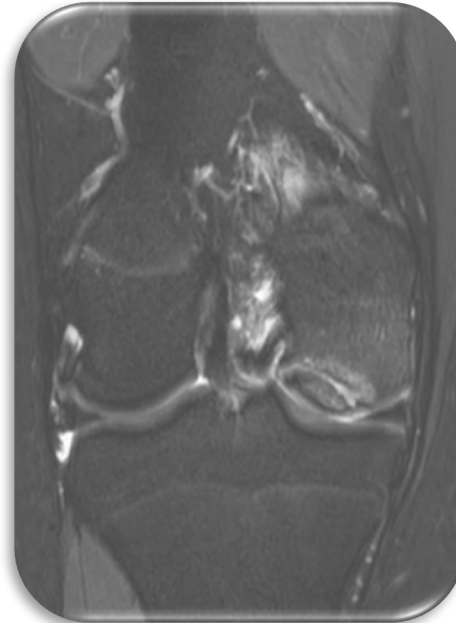
- Unstable osteochondritis dissecans (OCD) lesions of the knee require treatment of the pathologic subchondral bone + stabilization of articular cartilage
- Fixation with metal screws or bioabsorbable implants without treatment of the bone-cartilage interface has been associated with implant related complications and suboptimal OCD healing
- Purpose = To describe the surgical technique and early-outcomes of OCD debridement, autogenous bone grafting, and suture-based repair of unstable OCD of the knee in pediatric patients

Methods

- Retrospective, single center
- January 2020 – Jan 2023
- Age < 19 years
- Unstable OCD of the femoral condyle and trochlea (ROCK classification trap door and locked door) treated with open debridement, autogenous bone grafting from distal femoral metaphysis, and suture-based repair
- Minimum 12-month follow-up
- Post-op PROs = Pedi-IKDC, HSS-Pedi-FABS

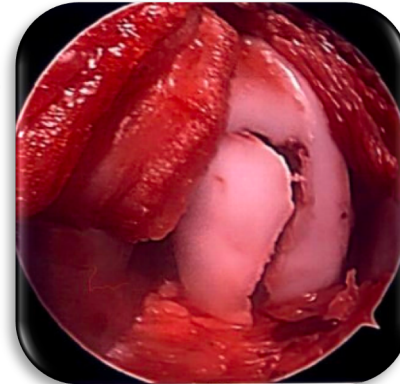
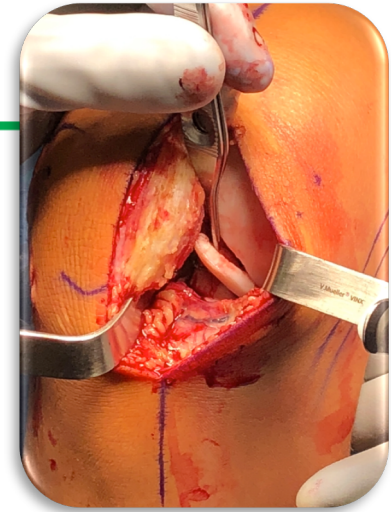
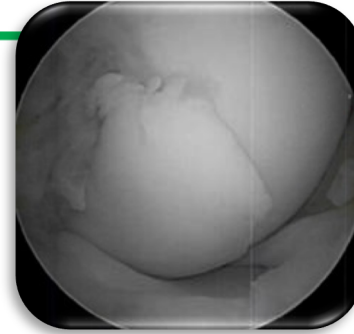
Results

- 16 patients
 - 9 males, 7 females
 - Mean age 15.0 years (11.7 – 17.9)
 - Mean BMI 25.7 kg/m² (17.8 – 49.5)
- Location
 - MFC (10 patients)
 - LFC (4 patients)
 - Trochlea (2 patients)



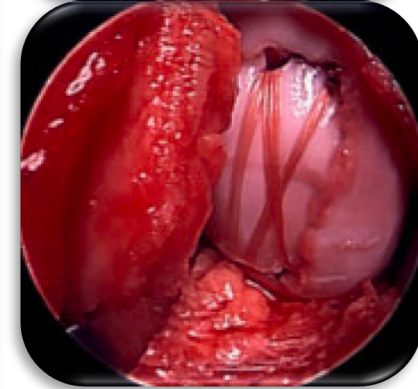
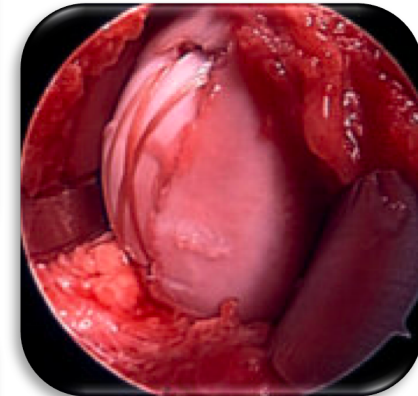
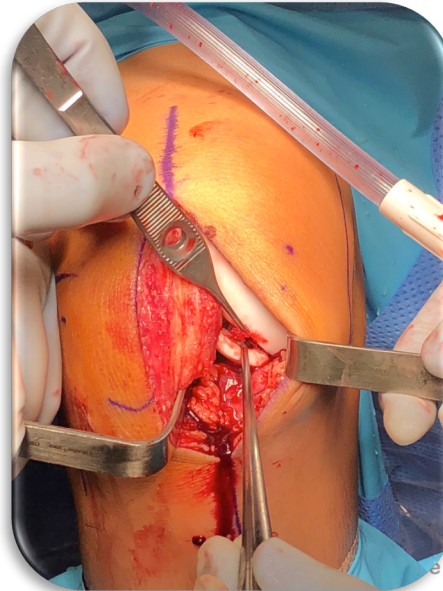
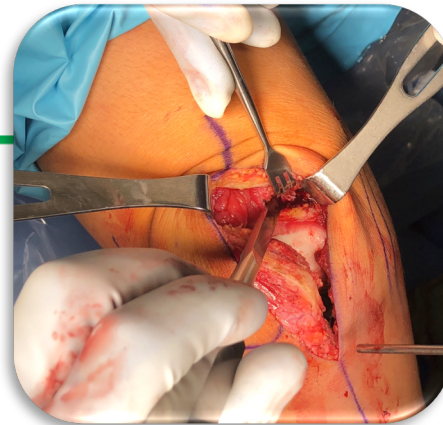
Surgical Technique

- Diagnostic arthroscopy
- Medial or lateral parapatellar arthrotomy
- Mobilization of the articular cartilage, maintaining intact hinge
- Debridement of fibrinous tissue and necrotic bone
- Curettage and drilling of the sclerotic bed



Surgical Technique

- Distal femoral autograft obtained from ipsilateral femoral metaphysis and morcellated
- Bone graft compacted into OCD base until chondral surface can be repaired flush with native surrounding cartilage
- Suture bridge repair using either vicryl or braided non-absorbable suture loaded through small biocomposite anchors



Post-Op Course

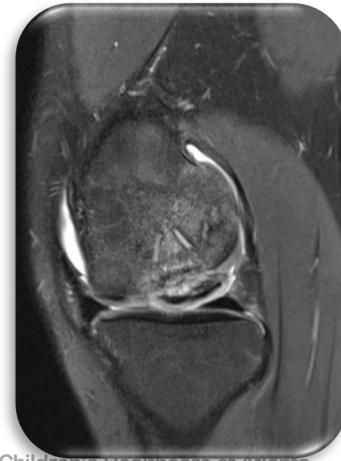
- NWB x 6 weeks, then weaning crutches over 2 weeks
- KI x 6 weeks
- PT beginning POD 2

- MRI to assess OCD healing at 6 months

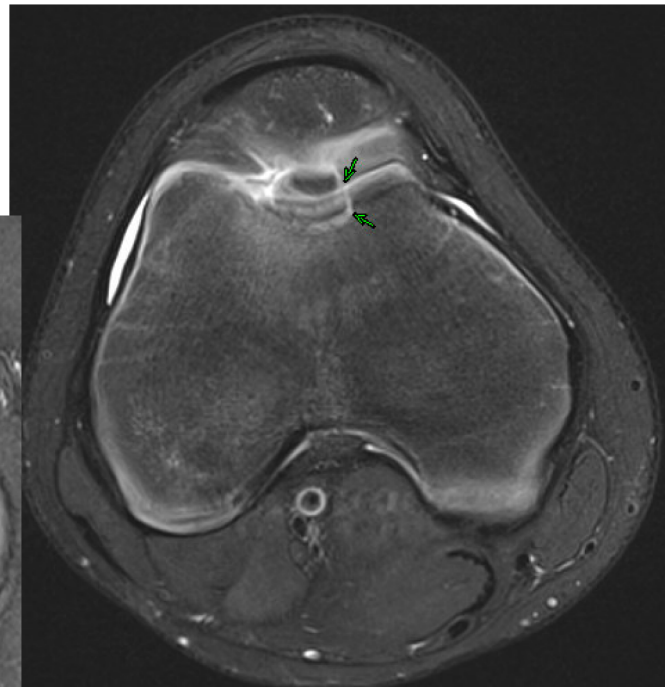
- Jogging and return to sport progression pending OCD healing

Results

- MRIs obtained in 15 patients (94%) to assess healing at mean of 5.0 months
- Bone graft incorporation, minimal bone marrow edema, congruent articular surface
 - 9 patients (60%)
- Progressive failure of the repair with bone marrow edema and cystic changes
 - 6 patients (40%)

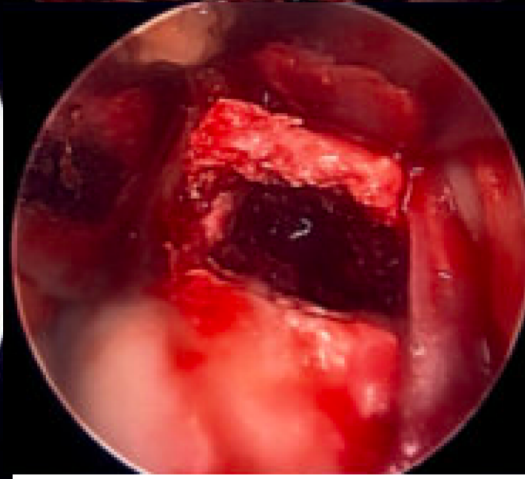
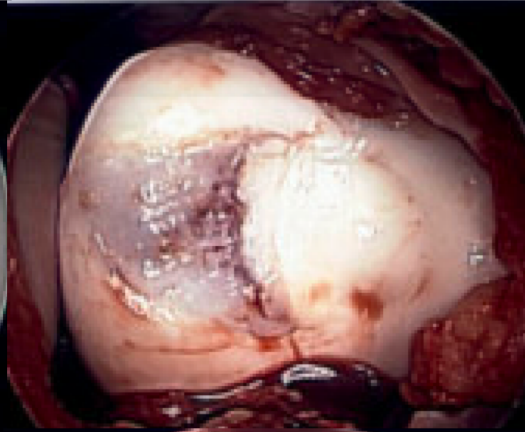
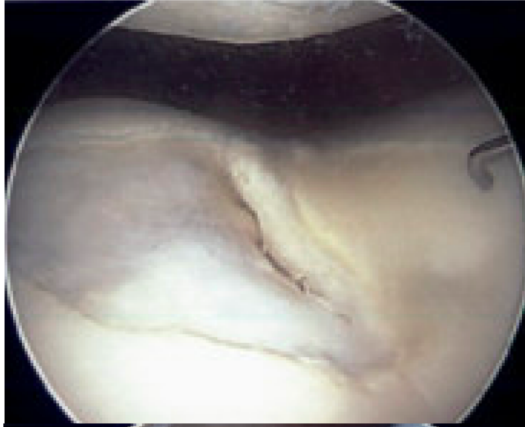


12yo M w/ stable LFC OCD, unstable trochlea OCD

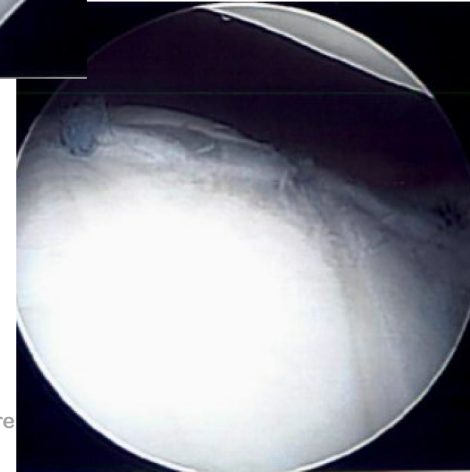
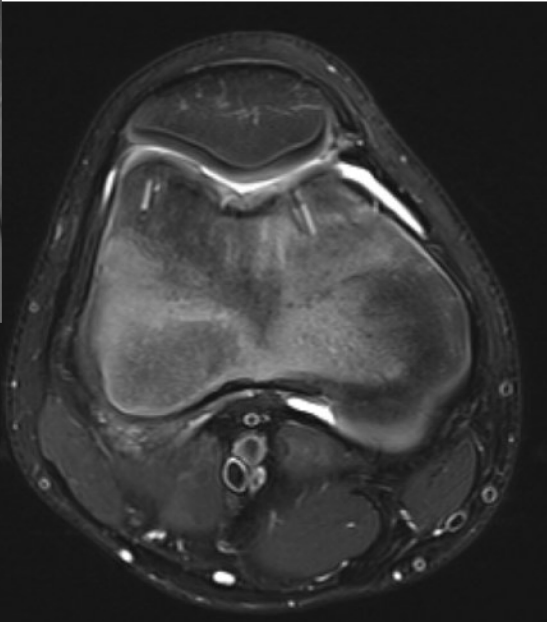


Open debridement, bone grafting, suture repair trochlea

Retroarticular drilling lateral femoral condyle



Follow-up MRI and arthroscopic images at time of suture removal 5 months s/p repair

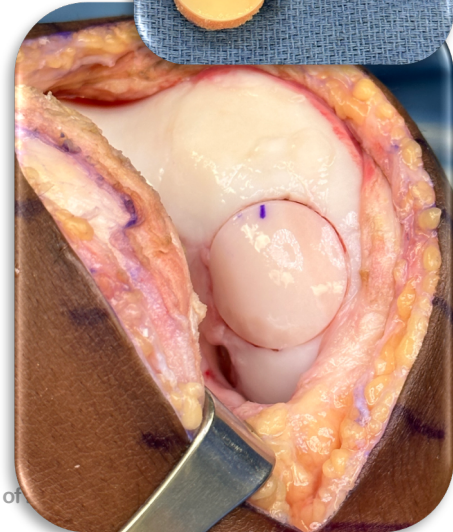
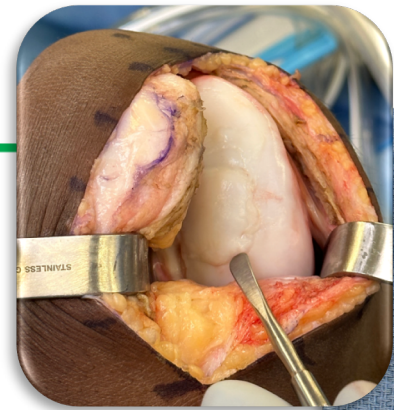


Results

- Mean clinical follow-up 19 months (12 – 38 months)
- PROs available for 13 patients (81%) at mean time of 21 months (12 – 39 months)
 - Median Pedi-IKDC = 94
 - Median HSS Pedi-FABS = 20
- 86% of athletes returned to sports post-operatively

Results

- Secondary surgeries in 8 patients (50%)
 - 5 patients with complete repair failure (31%)
 - 4 converted to osteochondral allograft transplantation
 - 1 converted to bone grafting + MACI
 - 1 patient with partial repair failure (6%)
 - Loose body removal, microfracture 5mm x 8mm unhealed area
 - 2 planned arthroscopies for removal of non-absorbable suture



Conclusions

- OCD debridement with autogenous bone grafting and suture-based repair is a viable single-stage surgical treatment for unstable OCD of the knee
- Benefits of this technique:
 - Improving biology of the parent-progeny interface
 - Enhancing stability
 - Maintaining the native cartilage
- One-third of patients may fail this technique and require further surgical treatment

Thank You

Crystal Perkins, MD

crystal.perkins@choa.org

404-414-6088

