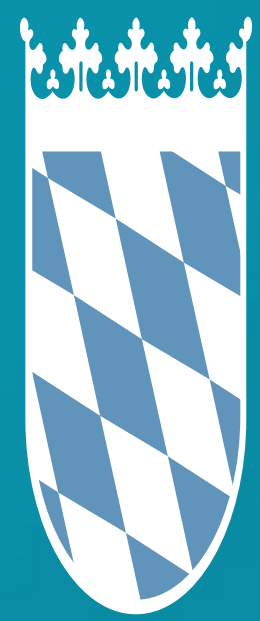




ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

Straight Anteriorization Tibial Tubercle Osteotomy Is Safe and Effective for Patellofemoral Cartilage Lesions

Nathan H. Varady, MD/MBA, Arjun Khorana, BS,
Riley J. Williams III, MD

Department of Sports Medicine, Hospital for Special Surgery, New York, NY

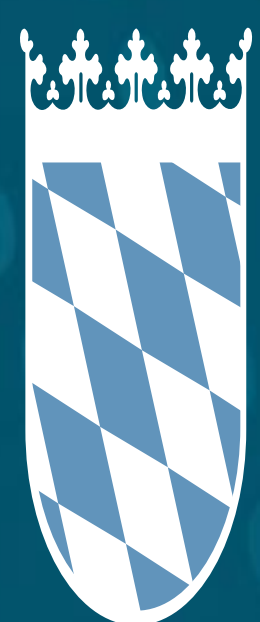


Faculty Disclosure Information

- Our disclosure(s) are:
- RJW:
- Arthrex, Inc: IP royalties; Paid consultant
- BICMD: Stock or stock Options
- Cymedica: Stock or stock Options
- Engage Surgical: Stock or stock Options
- Gramercy Extremity Orthopedics: Stock or stock Options
- Histogenics: Research support
- JRF Ortho: Paid consultant
- Lipogems: Paid consultant
- Pristine Surgical: Stock or stock Options
- RecoverX: Stock or stock Options



ISAKOS
CONGRESS
2025



MUNICH
GERMANY

June 8-11



Straight Anteriorization Tibial Tubercle Osteotomy Is Safe and Effective for Patellofemoral Cartilage Lesions

Nathan H. Varady, MD/MBA, Arjun Khorana, BS, Riley J. Williams III, MD

Department of Sports Medicine, Hospital for Special Surgery, New York, NY

No disclosures related to this work. Additional disclosures on the AAOS website.

Introduction

- **Background:** Sagittal plane malalignment is increasingly recognized as a risk factor for patellofemoral cartilage wear. While some cartilage lesions may be unloaded with anteromedializing tibial tubercle osteotomies (TTOs), other lesions may be better addressed with pure anteriorization TTOs (aTTOs).
- **Problem:** Traditional aTTO techniques were associated with unacceptable complication rates, however, and there is need for safer aTTO techniques.
- **Goal:** Assess the safety of a contemporary aTTO technique for patellofemoral overload.

Methods

- **Patients:** Consecutive patients undergoing a modern aTTO technique for isolated patellofemoral overload from 2016-2024 with minimum six-month follow-up
- **Technique:** In brief, this previously published technique consists of an anterior-posterior cut $\sim 5\text{-}10^\circ$ off the vertical line, a lateral-medial cut parallel to the posterior tibial cortex, straight anteriorization of the osteotomy shingle by 10-15 mm proximally with an anterior periosteal hinge distally, and fixation by two 4.5 mm lag screws. No proximal bone block is required
- **Primary Outcome:** Overall complication rate, including wound complications, nonunion, and fracture, among others.
 - Removal of hardware (ROH) was offered to all our patients and not considered a complication
- **Secondary Outcomes:** Range of motion (ROM) at 6- and 12-weeks and patient-reported outcome measures (PROMs) at two-years (among the 26 patients with minimum two-year follow-up)
- **Statistics:** Comparisons made with Student t-tests

Results

- 57 patients, mean follow-up 2.4 years (range 6.1 months-6.8 years)
- Mean (SD) age 30.5 (7.2) years, 54.4% women
- 39 (68.4%) patients underwent concomitant cartilage restoration procedures
- Mean anteriorization amount was 11.2 (2.2) mm
- Overall complication rate was 5.3% (3 patients)
 - Two (3.5%) manipulations under anesthesia for arthrofibrosis
 - One (1.8%) superficial cellulitis successfully managed with oral antibiotics alone
 - No episodes of wound dehiscence (0%), deep surgical site infection (0%), nonunion (0%), or fracture (0%)
- Mean ROM $0\text{-}122^\circ$ at 6-weeks and $0\text{-}130^\circ$ at 12-weeks
- 18 (31.6%) patients underwent elective ROH
- Significant improvements in mean International Knee Documentation Committee (41.0 vs. 81.1, $p < 0.001$) and visual analog pain (4.6 vs. 1.6, $p < 0.001$) scores from baseline to two-year follow-up

Discussion / Conclusions

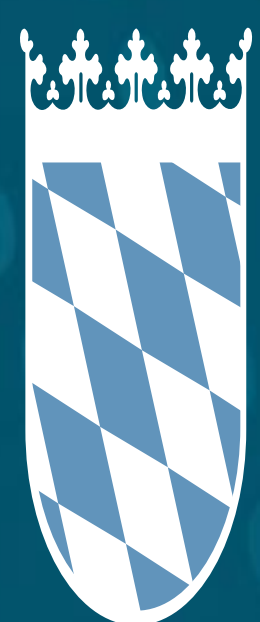
- Contemporary pure aTTO can be performed safely for isolated patellofemoral overload, with no instances of wound breakdown or nonunion/fracture encountered in this series.
- Furthermore, patients experienced substantial improvement in PROMs from baseline to two-year follow-up.
- Given the growing recognition of the importance of sagittal plane malalignment on patellofemoral chondral wear, these finding suggest contemporary aTTO may be increasingly considered as a treatment option for patients with patellofemoral chondral wear who may not be ideal candidates for traditional TTO techniques.
- Moving forward, indications for and long-term follow-up following aTTO should continue to be defined.

References

- Kaplan DJ, Mojica ES, Ortega PF, et al. Posterior tibial tubercle measured by the sagittal TT-TG distance correlates with increased risk for patellofemoral chondral lesions. *Knee Surg Sports Traumatol Arthrosc.* 2022;30(11):3733-3741.
- Lansdown DA, Christian D, Madden B, et al. The sagittal tibial tubercle-trochlear groove distance as a measurement of sagittal imbalance in patients with symptomatic patellofemoral chondral lesions. *Cartilage.* 2021;13(1 suppl):449S-455S.
- Namiri NK, Caliva F, Martinez AM, Pedoia V, Lansdown DA. A more posterior tibial tubercle (decreased sagittal tibial tubercle-trochlear groove distance) is significantly associated with patellofemoral joint degenerative cartilage change: a deep learning analysis. *Arthroscopy.* 2023;39(6):1493-1501 e1492.



ISAKOS
CONGRESS
2025



MUNICH
GERMANY

June 8-11