

Unintended Distalization Following Anteromedializing Tibial Tubercle Osteotomy with MPFL Reconstruction

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INTRODUCTION: To assess whether anteromedializing tibial tubercle osteotomy (AMZ TTO) results in reduction in patellar height when performed alongside medial patellofemoral ligament reconstruction (MPFLR) for the treatment of patellar instability.

METHODS: A retrospective review was completed on 33 knees (4 males, 29 females) with patellar instability who underwent AMZ TTO with MPFLR between 2017 to 2024. Patients who underwent TTO with planned distalization were excluded. Caton-Deschamps Index (CDI) was measured pre- and postoperatively from standard lateral radiographs and compared. Patella alta was defined as CDI >1.2. Further comparisons were done based on patients' quadriceps status at their postoperative visit, grouped by ability to perform a straight leg raise (SLR).

RESULTS SECTION: Patients' preoperative and postoperative CDIs were measured an average of 124 days before and 76 days after surgery, respectively. Following AMZ TTO and MPFLR, the mean CDI significantly decreased from 1.11 to 1.07 ($\Delta = -0.037 \pm 0.06$, $p = 0.002$). Patients with preoperative patella alta (N=8) had a significant reduction in CDI (1.29 to 1.23, $\Delta = -0.056 \pm 0.050$, $p = 0.02$), whereas the difference was not significant for those without preoperative patella alta (1.05 to 1.02, $\Delta = -0.031 \pm 0.068$, $p = 0.05$). No significant difference was found in preoperative to postoperative CDI change between the two groups ($p = 0.22$). CDI change was compared across three groups based on SLR ability: normal SLR, SLR with extensor lag, and unable to SLR. No significant difference was found by ANOVA and post hoc Tukey's tests also showed no significant pairwise differences (all $p > 0.05$).

DISCUSSION: AMZ TTO with MPFLR results in a small but significant reduction in patellar height. However, when stratified by preoperative CDI, this effect only persists in those with preoperative patella alta. Postoperative quadriceps status did not impact CDI change.

SIGNIFICANCE/CLINICAL RELEVANCE: (1-2 sentences): Even without planned distalization, AMZ TTO with MPFLR results in a modest reduction in CDI that is most consistent in knees with preoperative patella alta, and this effect is independent of postoperative quadriceps status. When performing AMZ TTO with MPFLR, surgeons should monitor patellar height, recognizing that the change may be modestly normalizing in alta yet is not a substitute for distalization when height correction is the goal.

