

PRECICE intramedullary nail in the treatment of adult leg length discrepancy

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- PMID: 32164952
- DOI: [10.1016/j.injury.2020.03.004](https://doi.org/10.1016/j.injury.2020.03.004)

Abstract

Background: Limb length discrepancy in adults is not an uncommon occurrence following trauma and limited literature exists on limb lengthening in skeletally mature populations using modern techniques. This study aimed to evaluate outcomes of limb lengthening surgery using the PRECICE magnetic limb lengthening intramedullary nail in an adult population.

Method: From 2013 to 2018, 21 adult patients were operated by a single surgeon, using the PRECICE nail, for lower limb length discrepancies. Low energy femoral osteotomies were performed via a limited approach. Tibial osteotomies were performed using a percutaneous technique and Gigli saw. A distraction rate of 0.75 mm/day was used as a standard protocol with change in rate of 0.25 mm/day implemented as required. Patients were followed up until radiological evidence of consolidation.

Results: Mean patient age was 36.4 years (range 21-65), with 19 patients being male. Seventeen femoral and four tibial lengthenings were performed. Mean follow up was 15.1 months (range 6-30). Eleven patients underwent deformity correction at time of nail insertion (10 femoral, 1 tibial). All patients achieved correct lengthening (mean gain 36.5 mm, range 18-80 mm). All patients consolidated their regenerate bone (mean 268 days, range 99-825). Mean femoral consolidation index was 6.5, mean tibial consolidation index was 16.1 ($p = 0.002$). Six patients had delayed consolidation of regenerate bone. Increasing age ($p = 0.04$), number of prior operations ($p = 0.03$), and smoking ($p = 0.01$) were associated with delayed consolidation. Four of 21 (19%) patients suffered a complication, with one implant failure.

Conclusions: The PRECICE intramedullary nail is a reliable limb lengthening device in skeletally mature patients, providing predictable lengthening and bone regeneration.

Keywords: Bone lengthening; Intramedullary nailing; Leg length inequality; Leginjuries; Lower extremity.

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