Infrapatellar Intramedullary Nail Approach Is Associated With Higher Rates of Patient-Reported Knee Pain Despite Lower Rate of Readmissions

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Purpose: Our objective was to determine differences in clinical and radiographic outcomes following either suprapatellar or infrapatellar approach for intramedullary (IM) nailing of tibial shaft fractures.

Methods: 311 consecutive patients who sustained tibial shaft fracture treated operatively with a reamed IM nail with at least 6-month follow-up were reviewed. Patients were seen at 6 weeks, 3 months, 6 months, and 12 months post IM nail fixation. Patients were grouped into cohorts based on whether the nail was inserted via a suprapatellar or infrapatellar approach. Data collected included patient demographics (initial injury information, surgical details) and follow-up information (readmission within 30 days, time to radiographic healing, development of fracture-related infection [FRI], patient-reported knee pain, reoperation, and other major and minor complications including hardware complications, deep vein thrombosis [DVT], and compartment syndrome). Cohorts were compared for significance using Fisher exact test, independent t-tests, and multivariate linear regression.

Results: Of 311 patients, 103 underwent an infrapatellar approach and 208 underwent a suprapatellar approach. When controlling for age, body mass index (BMI), Charlson Comorbidity Index (CCI), mechanism of injury, sex, closed vs open fracture, and tobacco use status, infrapatellar nailing was associated with a greater incidence of patient-reported knee pain at latest follow-up (mean 17.3 months) than those who underwent suprapatellar nailing (10.7% vs 4.8%, P = 0.038). Likewise, the infrapatellar cohort trended toward a greater incidence of removal of hardware due to pain compared to the suprapatellar cohort (15.5% vs 9.1%, P = 0.076). No differences were seen between cohorts in the development of FRI, nonunion, or other complications. Yet, infrapatellar tibial IM nailing was associated with a lower incidence of readmission within 30 days than suprapatellar tibial IM nailing (2.9% vs 9.1%, P = 0.037). There were no differences in time to radiographic healing between suprapatellar and infrapatellar cohorts.

Conclusion: These results suggest that infrapatellar tibial intramedullary nailing is associated with greater patient-reported knee pain than the suprapatellar approach. However, patients who underwent infrapatellar nail insertion had a lower incidence of readmission within 30 days than the suprapatellar approach.