

**An Alternative Approach to Intramedullary Nailing of the Tibia:
The SeMid Technique (Semi-Extended Midvastus Tibial Nailing)**

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Background/Purpose: Anterior knee pain continues to be a common complaint among patients recovering from intramedullary nailing of the tibia. Although more orthopaedic surgeons are utilizing the semi-extended technique for tibial nailing, there are concerns regarding iatrogenic injury to the patellofemoral joint. The midvastus approach is a viable alternative to the standard parapatellar arthrotomy for total knee arthroplasty (TKA) and has documented benefits with recovery and rehabilitation. The purpose of this study was to investigate the potential benefit of using this proven approach for semi-extended tibial nailing. This approach merges many of the known advantages of semi-extended tibial nailing, with the benefits of the midvastus approach. We hypothesize that intramedullary nailing of the tibia shaft using a midvastus approach will improve functional outcomes, good range of motion and minimize postoperative knee pain.

Methods: This study was a retrospective review of surveys administered as part of standard postoperative care visits and continues as a prospective, observational study. Patients were included for (1) age 18 to 75 years, (2) tibial shaft fracture, and (3) treated by 1 of 3 orthopaedic trauma surgeons using the midvastus approach. At each follow-up visit (2, 6, 12, 26, and 52 weeks), patients completed surveys, including the Short Musculoskeletal Function Assessment (SMFA) and visual analog scale (VAS) assessing current knee pain and pain in the past 4 weeks. Range of motion and radiographic examination were also evaluated. This study was approved by the hospital IRB. Preliminary results are presented.

Results: Since April 2011, 67 patients underwent intramedullary nailing of the tibia using the midvastus approach. Of this total, 39 were eligible, 13 were missing data at 1 year, and 13 are being actively followed. A total of 13 patients (15 tibias), with an average age of 43.3 years (± 17.8 SD), completed follow-up at 1 year. The majority were male (77%) with 53.4 (± 11.5 SD) weeks of follow-up. Using a VAS from 0 (no pain) to 10 (worst possible pain), patients had an average final (1-year) current pain rating of 1.50 (± 1.56 SD) and a rating of 2.35 (± 1.76 SD) in the 4 weeks prior to their 1-year visit. Five patients (38%) denied any knee pain the day of their last visit. The SMFA had low index scores and good functional outcomes: mean dysfunction index standardized = 10.36 (± 7.04 SD); mean bothersome index standardized score = 9.58 (± 6.34 SD). Mean scores were also low for each of the four categories composing the dysfunction index, with little difficulty with mobility (18.45 \pm 14.56 SD). Patients achieved full range of motion between 26 and 52 weeks postoperatively (0°-135°). The average knee flexion was 137.67° (± 3.20 SD) and the average knee extension was -1.40° (± 2.85 SD). No significant iatrogenic damage to the patella or femoral trochlear cartilage was noted at the time of closure of the arthrotomy. There were no infections or nonunions.

Conclusion: Semi-extended tibial nailing using the midvastus approach has shown promising early clinical results with respect to postoperative knee pain and function. At 1 year after

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surgery, patients reported minimal pain and low levels of dysfunction and bothersomeness. Therefore, the midvastus approach allows the surgeon to benefit from the logistical and technical advantages of semi-extended tibial nailing without violating the patellofemoral cartilage, hopefully leading to less anterior knee pain and maintaining knee range of motion.