

Femur And Tibia Press-Fit Osseointegration - A Comparison Of Safety And Outcomes

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INTRODUCTION: Osseointegration (OI) for lower limb amputees confers improvement of patient quality of life, prosthetic use, and walking ability by eliminating socket related problems. However, the available literature has no studies focusing on the differences in safety and outcomes of patients that underwent transfemoral osseointegration as compared to those that underwent transtibial osseointegration. The purpose of this study was to directly compare the adverse events along with clinical and surveyed outcomes of these two patient groups.

METHODS:

Patients who had lower extremity osseointegration with a minimum of one year follow up at a single institution were reviewed. They were categorized into two groups, Femur or Tibia. Adverse events were recorded, and change of mobility and LD-SRS and PROMIS outcome scores were compared.

RESULTS:

There were 147 limb segments, and data is presented as Femur (83/147=56%) vs Tibias (64/147=44%). There were no significant differences in adverse event rates. Surgical debridement 14/83=17% vs 3/64=5%, $p=0.131$. Periprosthetic fracture occurred for 10/83=12% vs 0, $p=0.057$. Removal for loosening was 0 vs 2/64=3% (both were reimplanted), $p=0.285$. Removal for infection occurred for 2/83=2% vs 1/64=2%, $p=0.812$. Removal for implant fracture was 0 vs 1/64=2%, $p=0.451$.

Preoperatively, femur patients had worse mobility than tibia patients (6MWT 211.7 ± 163.0 vs. 280.5 ± 153.5 m, $p=0.017$) and wore their prosthesis fewer hours daily (7.5 ± 6.4 vs 10.7 ± 5.6 hours/day, $p=0.008$). Their preoperative LD-SRS and PROMIS scores were similar. Postoperatively, 6MWT were similar (320.9 ± 116.1 vs 404.3 ± 71.7 m, $p=0.201$), though transfemoral osseointegration patients generally wore their prostheses for fewer hours daily (13.2 ± 4.9 vs 15.2 ± 2.7 hours/day, $p=0.009$). Both the femur and tibia groups significantly improved in all domains of the LD-SRS and PROMIS surveys. The tibia patients did improve to a greater magnitude than the femur patients for these surveys.

DISCUSSION AND CONCLUSION:

Press-fit osseointegration significantly improves the mobility and quality of life for both femur-level and tibia-level amputees. There is a similar rate of adverse events for both levels. Tibia-level amputees may experience an even greater improvement of quality of life than femur-level amputees.