

## **Primary Amputation with Osseointegration Versus Osseointegration for Existing Amputation**

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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 suitability for primary amputation with osseointegration, versus the more commonly performed osseointegration for existing amputees. The aim of this study was to compare the clinical and surveyed outcomes of these two patient types.

**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. Group 1 were patients who had primary amputation with simultaneous osseointegration in a single surgery. Group 2 were patients who had osseointegration for an existing amputation. Patients who had primary amputation as a direct setup for near-term planned osseointegration performed at a separate surgery were excluded. Adverse events were recorded, and change of mobility and LD-SRS and PROMIS outcome scores were compared.

### **RESULTS:**

There were 139 limb segments, 81 femurs and 58 tibias. 15 patients had simultaneous amputation and OI (4 femoral and 11 tibial), while 124 patients had OI for a well-established amputation (64 femur and 32 tibia). There were no statistically significant differences in the rate of any adverse event category.

The data for 81 femurs is presented as simultaneous (4/81=5%) vs existing (77/81=95%). Surgical debridement was 2/4=50% vs 12/77=16%, p=.139. Periprosthetic fracture was 1/4=25% vs 9/77=12%, p=.420. Skin refashioning was 2/4=50% vs 10/77=13%, p=.105. Removal for infection was 1/4=25% vs 1/77=1%, p=.098.

The data for 58 tibias is presented as simultaneous (11/58=19%) vs existing (47/58=81%). Surgical debridement was 2/11=18% vs 1/47=2%, p=.089. No periprosthetic fractures occurred. Skin refashioning was 0 vs 1/47=2%, p=1.000. Non-infectious loosening, removal for infection, and removal for implant fracture were all 0 vs 1/47=2%, p=1.000.

All mobility outcomes and LD-SRS and PROMIS survey domains significantly improved for both the simultaneous and existing cohorts. The magnitude of improvements were similar between the two cohorts.

### **DISCUSSION AND CONCLUSION:**

Patients who have simultaneous amputation with osseointegration versus osseointegration for an existing amputation have similar improvement of mobility and surveyed outcomes, without a recognizable difference in adverse event rate. It seems reasonable to perform osseointegration at the time of primary amputation for well informed patients who do prefer to rehabilitate with osseointegration rather than a socket prosthesis.