

Successful Limb Salvage Reconstruction Using Bulk Femoral Head Allograft

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INTRODUCTION:

The use of femoral head allografts in salvage surgeries for lower extremity reconstruction helps address surgical problems of large bone deficits. There are very few publications and mixed results in the literature as to the outcomes of this salvage procedure. These limb salvage procedures involve significant surgical complexity with the end goal of retaining a stable, brace-able lower extremity. The purpose of this retrospective review is to report the results and utility of bulk femoral head allograft for limb salvage including time to weight-bearing, CT confirmed fusion time, reoperation rates, and ultimate limb salvage success. Additionally, this article categorizes femoral head surgical preparation, adjunct biologics use, fixation constructs, and dissection techniques used.

METHODS:

Patients who underwent reconstructive limb salvage surgery using femoral head allografts over a 5-year period (2015-2020) were identified. The surgeries were among 5 different fellowship trained surgeons at a single institution. Indications included post traumatic AVN, charcot ankle, revisional surgery, and failed total ankle replacement. Femoral heads were used in either ankle fusions alone or in tibiototalcalcaneal fusion. Time to weight-bearing, CT fusion time, reoperations, and ultimate limb salvage were recorded. Reoperations were reported minor if involved partial HWR, superficial I&Ds, or exostosis/HO removal. Major reoperations were defined as full revision surgery/failure of femoral head construct, placement of antibiotic rods for deep infection, or BKA. Limb salvage was defined as being successful if the patient was walking with or without bracing at last follow up.

RESULTS:

Twenty-three cases were identified with 13 performed for failed total ankle replacements, 7 posttraumatic avascular necrosis of the talus, and 3 neuropathic Charcot ankles. The average radiographic follow-up time was 665 days with an average time to weight-bearing of 86.48 days. In total, 18/23 patients had CT confirmation of femoral graft union with an average time to union of 461.92 days. Nine patients were found to have less than 50% graft incorporation at last follow up. There were 9 reoperations recorded, 8 minor and 1 major. All patients were chart documented stable with independent weight-bearing either with or without a brace on last clinic follow up.

DISCUSSION AND CONCLUSION:

Limb salvage in cases of large bone defects can be very challenging. We report a high success rate of limb salvage using bulk femoral head allograft. Complete fusion of bulk femoral head allograft although desirable, was not necessary to maintain limb salvage in this retrospective study. Patients were able to weight bear and maintain integrity of the bulk allograft despite lengthy time to achieve fusion in cases where fusion was achieved. This study highlights that bulk femoral head allograft can offer excellent salvage options with high degree of success in complex limb salvage reconstruction.