Minimally Invasive Surgery for the Management of Osteomyelitis in the Lower Extremity by use of a Bone Harvester: A Case Series

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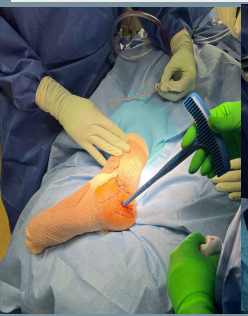
Introduction

The management of osteomyelitis in the adult population is a challenging proposition. Patients frequently present with multiple comorbidities including diabetes, peripheral arterial disease, infection, and a history of ulcerations. Historically, surgical excision along with IV antibiotics are a mainstay of treatment for tibial and calcaneal osteomyelitis. Repeat surgical interventions are common and while osseous resection may be achieved, soft-tissue infections and delayed wound-healing require postoperative management that can take months to resolve. In this study, we utilized a three-pronged approach as compared to the mainstay of treatment: minimally invasive surgical bone harvesting, systemic antibiotics along with placement of local antibiotics.

Methods

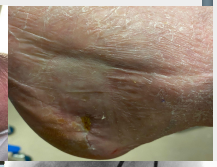
A Bone Harvester* was used to surgically core out non-viable infected bone in two separate studies. In one study, non-viable calcaneal bone was cored out using a Bone Harvester. The deficit was then packed with antibiotic-impregnated calcium sulfate beads. In another study, the tibia was debrided and acellular collagen power was mixed with vancomycin powder and packed into the surgical site

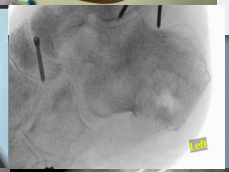
* Bone Harvester (Avitus®) - Avitusortho Shelton, CT

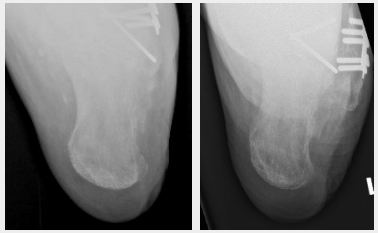


Methods Continued

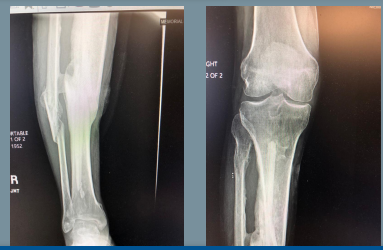
Case 1: 91 y/o male presented with a draining left calcaneus chronic ulcer, measured 0.4x0.1x1.0cm, probed to bone. Incision was made down to bone dorsolateral to ulcer. A pilot hole creator was placed down to bone. Pressure was applied perpendicular to the handle until the tool bottomed out while rotating in a circular manner. The bone harvester was placed into pilot hole. A circular motion was used to excise non-viable bone from calcaneus with use of harvester. Mini c-arm was used to confirm excision of bone. Post-debridement measurement was 0.6x0.5x2.5cm. Calcium sulfate mixed with 500mg of Vancomycin powder absorbable antibiotic beads were then placed into the calcaneal defect. The wound was reapproximated with 2-0 Nylon.







Case 2: A male was involved in a MVA with multiple traumatic injuries including a right long bone fracture of the tibia and fibula. Orthopedic surgery performed an ORIF with intramedullary nail placement. The patient went on to develop an abscess. Ortho performed an I&D and plastic surgery subsequently performed a rotational fasciocutaneous flap. The IM nail was removed due to concerns for seeding an infection. After a few years, the patient was seen by Podiatry for a non-healing wound at the distal tibia with concern for OM. A bone harvester was used to debride devitalized distal tibial bone. The deficit was packed with acellular collagen mixed with vancomycin powder.



Results

Both patients were followed up with routine x-rays. The calcaneal ulcer was with complete closure in three months. The patient was able to ambulate in sneakers with no complications. The tibial ulcer was with complete closure in two months. To date, no recurrence of pathology was noted in either case. Surgical management via way of amputation was not a medical necessity.

Discussion

The aim of this study is to highlight a minimally invasive approach to surgical management of osteomyelitis in the lower extremity, an alternative to amputation or limb loss. The addition of local absorbable antibiotics to the surgical site has shown benefit. Minimal surgical resection, local antibiotic placement, and intravenous antibiotics have shown to be robust treatment option in the management of tibial and calcaneal osteomyelitis.

References