

# Antibiotic impregnated bone cement for limb salvage in Texas 3D ulcers

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## Introduction

The management of patients with critical limb threatening ischaemia and underlying osteomyelitis is a significant challenge and amputation rates were historically high. The results of a multidisciplinary approach to limb salvage using adjunctive Cerament® - a gentamicin or vancomycin eluting injectable bone cement, allowing the delivery of antibiotics at high concentration directly into bone over a 28 day period, are discussed.

## Methods

A retrospective case note review of patients treated with Cerament G® between March 2020 and August 2020 with Texas 3D ulceration. Our protocol included diabetic control, intravenous antibiotics, debridement, revascularisation, Cerament® implantation based on bone culture sensitivities and topical negative pressure. Patients were followed up for a minimum of 3 months.



Figure 1: Pathway for patients with Texas 3D ulceration

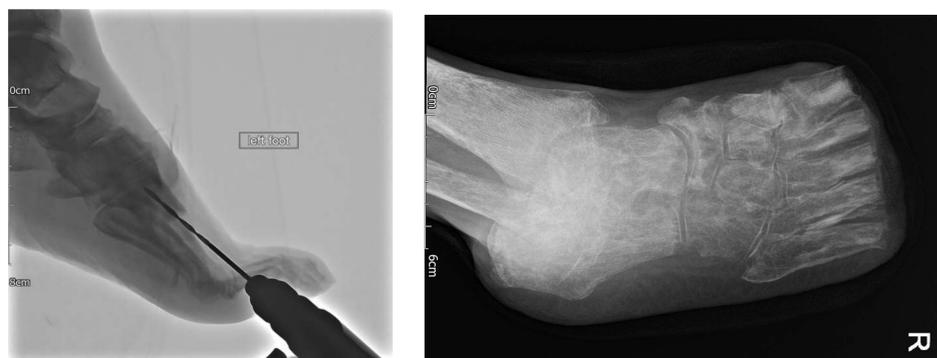


Figure 2 : Medullary canal drilling allowing dead space obliteration.

Figure 3: Post-implantation appearance of Cerament in medullary cavities.

## Results

Case Summary		3 month outcome
76 yrs diabetic	Pyogenic forefoot infection Stage 1: Guillotine transmetatarsal amputation, femoral endarterectomy and popliteal angioplasty Stage 2: Cerament® G implantation (Figure 4) Bone cultures revealed MRSA, received intravenous piperacillin and teicoplanin	Healed with VAC
49 yrs diabetic	Wet gangrene at below knee stump Stage 1: Above knee amputation Stage 2: Cerament® G implantation into femur and closure (Figure 5)	Healed primarily
86 yrs smoker	5 <sup>th</sup> metatarsal base osteomyelitis following common iliac stenting, femoral endarterectomy and 5 <sup>th</sup> metatarsal ray amputation Stage 1: Debridement and bone biopsy Stage 2: Cerament® G implantation to metatarsal (Figure 6)	Healed with VAC
76 yrs diabetic	Pyogenic midfoot infection and deep calcaneal ulcer Stage 1: Prosthetic femoropopliteal bypass and heel debridement Stage 2: Cerament G® implantation using Silo technique.	Below knee amputation due to poor hindfoot vascularity
38yrs	Kidney and pancreas transplant patient with an infected calcaneal ulcer Stage 1: SFA recanalization and stenting Stage 2: Cerament G® implantation using Silo technique and casted	Healed with VAC



Figures 4 , 5 & 6

## Discussion

These cases illustrate the results of an integrated diabetic foot pathway using modern vascular and orthopaedic techniques. Four of the five limbs referred for amputation were salvaged.

The results with Cerament® demonstrate that it is a useful adjunct in preventing recurrent osteomyelitis in open wounds in conjunction with intravenous antibiotics and VAC therapy. A 3 stage approach is recommended as shown in Figure 1.

## Key Learning Points

Osteomyelitis in the presence of vascular disease can be salvaged, with vascular reconstructive procedures, debridement of infected bone, curettage of intramedullary cavity and local infiltration of Cerament® G or V

Use of regional anaesthesia for multiple procedures by avoidance of inpatient clopidogrel/rivaroxaban

Patients without the necessary angiosomal perfusion either antegrade or retrograde from the pedal arch and those with extensive tissue loss are better treated with below knee amputation

Vacuum assisted closure can be used 72 hours post-procedure without Cerament® leakage alone or with skin grafting to close wounds

## Conclusion

These results demonstrate that amputation is no longer the standard of care in patients with Texas 3D ulcers.