Use of CERAMENT™ as a Bone Void Filler in Complex Foot and Ankle Reconstruction

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### Synthetic Bone Substitutes

- Ceramic bone substitutes are ideal matrices for bone ingrowth because the bio-organic component of bone is comprised of hydroxyapatite<sup>1</sup>
- Calcium phosphate-based bone substitutes have been demonstrated to be safe and effective in trauma applications<sup>2-4</sup>
- CERAMENT<sup>TM</sup> comprises flowable hydroxyapite particles with a setting calcium sulfate paste delivering an immediate setting strength

#### **CERAMENT<sup>TM</sup>**

Bone healing demonstrated via histology in pre-clinical small animal models<sup>7-9</sup>

Demonstrated to be safe and effective in spine<sup>10</sup>, trauma<sup>11</sup>, and foot & ankle<sup>12</sup> clinical applications with full bone remodeling within a year <sup>11</sup>

Decided to try CERAMENT<sup>TM</sup> initially in conjunction with allograft, and/or allograft in foot and ankle reconstruction, to seal around the graft for containment and to fill residual voids because of its injectability and full setting within one hour

Based on the clinical success of this application in my practice, I have increased my use of CERAMENT<sup>TM</sup> as a primary bone graft substitute in selected cases

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#### Limb Salvage of a Diabetic Charcot Arthropathy with Osteomyelitis





- 57 year old white male with a long standing mid foot diabetic ulcer secondary to a neuropathic charcot deformity.
- Instability at the ankle & sub talar joint, as well as the midfoot.
- Talar head exposed; osteomyelitis diagnosed via bone biopsy.

## **Initial Treatment**

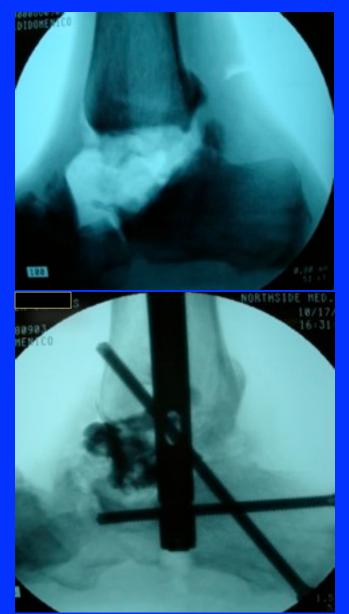


Gastrocnemius recession & application of an external fixator for realignment & stabilization

Bone debridement followed by intravenous antibiotics and local wound care.

At approximately 6 weeks the wound was resolved & infection markers improved.

# Stage 1 Reconstruction: Ankle



- Reconstruction planned in 2 stages to provide stability of ankle & mid-foot to prevent reoccurrence.
- The first stage consisted of a complete talectomy and application of an intramedullary retrograde nail.
- The talus bone void was replaced with a combination of allogenic bone soaked in autologous blood.
- Cerament<sup>™</sup> used to enhance cancellous bone integrity and fill in any residual gaps.

## Stage 2 Reconstruction: Mid-Foot



2nd stage reconstruction of mid-foot was performed eight weeks after ankle reconstruction & evidence of bony consolidation.

Bone resection arthrodesis via locking plate.



The resected bone void was backfilled as before with the allogenic bone and autologus blood composite.

■ Cerament<sup>™</sup> used to enhance cancellous bone integrity and fill in any residual gaps

### **Postoperative Progress**



- For each reconstruction, the patient was postoperatively immobilized for 2 months.
- At four months from the second reconstruction (mid-foot), the patient was full weight bearing.



Subsequent to the second reconstruction, transformation to solid bone progressed at each monthly visit.

At six months, the bone appears to

# **32 Month Clinical View**



A Clinical View: Post-op thirty-two months. This demonstrates a successful plantar-grade, stable foot & ankle, free of ulcer & infection.

Such a positive result has been typical in my eclectic series of foot & ankle reconstructions utilizing CERAMENT<sup>TM</sup>.

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