

# 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™ comprises flowable hydroxyapite particles with a setting calcium sulfate paste delivering an immediate setting strength

# CERAMENT™

- 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™ 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™ as a primary bone graft substitute in selected cases

# 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 mid-foot.
- ❑ 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 recurrence.

- The first stage consisted of a complete talar resection and application of an intramedullary retrograde nail.



- The talus bone void was replaced with a combination of allogenic bone soaked in autologous blood.

- Cerament™ 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™ 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™.

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