

Guarding Your Gait:

Preventing Metatarsal Amputation And Its Long-Term Effects

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BACKGROUND

•Negative Consequences of Metatarsal Amputation:

- Amputation disrupts the foot's natural structure, creating new pressure points.
- This altered structure leads to uneven weight distribution during walking, increasing the risk of pressure that leads to skin breakdown in other areas of the foot.

•Increased Reliance on Orthotics:

- To compensate for the altered foot mechanics, patients often require custom inserts or orthotic devices.
- These orthotics require frequent adjustments to maintain proper fit and functionality.
- A prior study indicates that most patients wear their prescribed orthotics for a maximum of only 4 hours daily.
- This necessitates increased healthcare visits and carries the risk of complications if not managed correctly.

•Primary Goal:

- Preventing Amputation: The overarching objective for long-term wound healing and preventing new wounds is to avoid amputation altogether.
- This is due to the cascade of complications that amputation causes.

METHODS

•**Patient Population:** Five patients with confirmed metatarsal osteomyelitis and associated ulcers were selected.

•Surgical Treatment:

- Application of a flowable gentamicin antibiotic-based sulfate graft directly to the infected bone.
- Correction of concurrent anatomical deformities (e.g., hammertoes).

•Post-Operative Care:

- Outpatient wound care with regular dressing changes.
- Emphasis on secondary intention healing.
- Monitoring for signs of re-infection through cultures and imaging.
- Ongoing follow-up.
- Strict weight-bearing restrictions using a CAM boot or non-weight-bearing status depending on wound location and procedures performed until complete healing.

Case 1

- 60 Year old male patient presenting with ulcers positive for osteomyelitis in both second and fifth digits. Filled distal and proximal phalanx of both digits with Cerament G. Arthroplasty of second, third, and fifth digits completed. Dressings to closure include collagen and silver alginate. Healing complete 4 months from Cerament injection.
- HbA1C- 7.2
- BMI- 29
- PMH: Diabetes type 2, GERD, Hyperlipidemia, HTN, Sleep Apnea, Bell's Palsy
- Previous fourth-digit amputation on the affected foot.



Case 2

- 39 year old male presents with Diabetic ulcer to right 5th metatarsal positive for osteomyelitis. Proximal and distal fifth metatarsal filled with Cerament G. Patient ambulates in CAM boot until complete healing is achieved. Dressings to closure include copper and foam border. Healing complete 3 months from Cerament injection.
- Current smoker
- HbA1C- 10.8
- PMH: Type two Diabetes Mellitus, Hypertension, Hyperlipidemia
- Previous Trans-metatarsal amputation of right foot



Case 3

- 81 year old female presents with a Diabetic ulcer to the plantar surface of left foot, second and third metatarsals are positive for osteomyelitis. Proximal and distal second and third metatarsals filled with Cerament G. Primary closure of the wound is completed with antibiotic beads in base. Dressings to closure include collagen and copper alginate. Healing complete 11 months from initial Cerament injection.
- HbA1C- 6
- PMH: Type two Diabetes Mellitus, Thyroid disease, Hypertension
- Previous Trans-metatarsal amputation of right foot



RESULTS

•Successful Outcomes:

- Complete closure of metatarsal ulcers.
- Effective treatment of osteomyelitis.
- Avoidance of any amputations, while re-balancing the biomechanics of the foot to prevent recurrence at same site
- Successful healing achieved for all five patients in the outpatient wound clinic.
- Patients returned to full weight bearing status without the need of orthotics.

•Treatment Details and Results:

- All patients received a flowable gentamicin antibiotic-based sulfate bone void filler (Cerament G) during surgery.
- As a precautionary measure, two patients received a second fill of Cerament G during the operative primary wound closure.
- No patients experienced re-infection following the initial Cerament G application.

•Overall Conclusion:

- The treatment protocol, utilizing Cerament G and comprehensive post-operative care, demonstrated a high success rate in treating metatarsal osteomyelitis and associated ulcers, leading to complete healing and functional recovery for all patients.

DISCUSSION

•Limb Preservation Focus:

- Amputation should be considered a last resort in viable bone. It is not the initial treatment.
- Flowable antibiotic products (like Cerament G) offer a viable and effective alternative for managing osteomyelitis.
- Further research should prioritize limb preservation strategies.

•Benefits of Retaining Digits:

- Preserving even small body parts, such as digits, can significantly decrease the need for long-term orthotic use.

•Importance of Biomechanical Correction:

- Addressing biomechanical deformities during treatment is crucial to prevent ulcer recurrence at the same site.

•Call for Continued Research:

- Ongoing research is essential to further refine and improve limb preservation techniques for osteomyelitis and related conditions.