

EP-212

Ray 절단 후 일차 봉합을 위한  
항생제 함유 골 시멘트 비드 지지체  
사용: 증례 보고

Antibiotics-Loaded Bone Cement Bead  
Scaffolding for  
Primary Closure After Ray Amputation: A  
Case Report



순천향대학교 구미병원  
김정환, 김세영\*

**Background :** Ray amputation is frequently performed in diabetic foot patients with osteomyelitis. Flap-based reconstruction, such as plantar fillet flaps, is commonly used to achieve durable coverage. However, diabetic patients are predisposed to wound healing complications due to impaired circulation, including marginal ischemia, wound dehiscence, and deep tissue infection. Persistent dead space may further compromise healing. We report a case in which antibiotic-loaded bone cement beads were used as internal scaffolding to facilitate primary closure without flap mobilization.

**Methods :** A 70-year-old male with diabetes mellitus presented with gangrene of the fourth toe. Imaging demonstrated osteomyelitis involving the fourth metatarsal. (Figure. 1) A fourth ray amputation with radical debridement was performed. Negative pressure wound therapy was applied to promote granulation and optimize the wound bed. After stabilization, residual medial forefoot dead space remained. Small antibiotic-loaded bone cement beads were fabricated intraoperatively and inserted to fill the space, providing structural support and localized antimicrobial effect. (Figure. 2)

**Results:** The wound was subsequently closed primarily with reduced tension. (Figure. 3) No wound dehiscence or recurrent infection occurred during follow-up. The wound healed without additional surgical intervention maintaining stable soft tissue coverage of the medial forefoot without the need for additional flap reconstruction.

**Conclusion:** Antibiotic-loaded bone cement bead scaffolding after ray amputation may facilitate primary closure while addressing dead space and providing local antimicrobial support. The bead construct effectively obliterated dead space and functioned as an internal scaffold, preventing medial soft tissue collapse. This strategy may represent a simple and reproducible adjunct in selected diabetic foot patients.



**Figure 1.** A 70-year-old male with diabetes mellitus presented with gangrene of the fourth toe. Imaging demonstrated osteomyelitis involving the fourth metatarsal.



**Figure 3.** Primary wound closure without flap coverage after filling the residual dead space with antibiotic-loaded bone cement beads acting as internal scaffolding.



**Figure 2.** (A) Mixing of antibiotic-loaded bone cement. (B) Fabrication of small bone cement beads. (C) Postoperative radiograph demonstrating bead placement within the residual dead space.