

Case study: The use of BIO⁴ in a high energy pilon fracture

A review by Dr. Michael Archdeacon, MD

Patient history:

Patient is a 78 year old female who sustained an open, right pilon fracture after a high speed motor vehicle accident. The patient is moderately healthy with minor comorbidities. Patient sustained a closed talo-navicular dislocation and cuboid fracture in the ipsilateral foot.

Assessment:

On assessment, patient had a gross deformity and instability of the right ankle with a seven centimeter, obliquely oriented open fracture wound along the medial, distal tibia. Comminuted fracture segments were visible in the wound (Figure 1A and 1B). The lateral soft tissues were intact and moderately edematous. It was determined that the injury should be treated as a staged procedure.

Procedure/treatment:

The initial surgery included debridement, wound management and provisional external fixation. On post-injury day 9, the patient returned to surgery for removal of the antibiotic beads and external fixation, as well as definitive open reduction and internal fixation. Stabilization was performed with a locking plate construct utilizing a limited anterior-lateral approach along with locking and non-locking screws. The metadiaphyseal defect was addressed by placing 20 cc of BIO⁴ into the defect (Figure 2A and 2B).



Figure 1A: AP X-ray of right ankle



Figure 1B: ML X-ray of right ankle



Figure 2A: After surgical treatment



Figure 2B: After surgical treatment

Follow-up:

The patient was seen in follow up two weeks after definitive fixation and sutures were removed. The patient was placed in a post-operative boot and outpatient physical therapy was initiated for active range of motion and gait training while maintaining a non-weightbearing gait. At 10 weeks, the fractures appeared consolidated on plain radiographs and weightbearing as tolerated gait was allowed (Figure 3A, 3B and 3C). At 6 months, the patient was seen for final follow up and her wounds were completely healed and radiographs demonstrated a consolidated fracture with acceptable joint and limb alignment (Figure 4A, 4B, and 4C).

Conclusion:

This case required early and aggressive open fracture debridement, dead space management, and provisional stabilization with spanning ankle external fixation. The use of internal fixation with BIO⁴ during the definitive treatment served a useful adjunct. This case illustrates a positive outcome with combined treatment modalities and utilizing the variety of implements available to the surgeon.



Figure 3A: 10 weeks post-operative



Figure 3B: 10 weeks post-operative

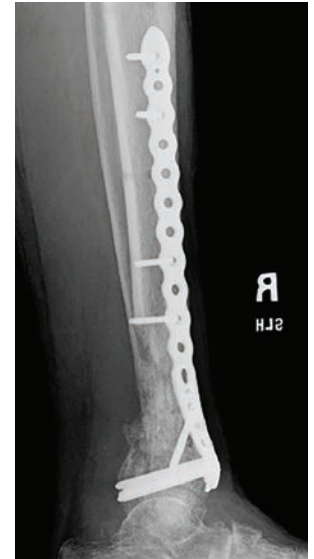


Figure 3C: 10 weeks post-operative



Figure 4A: 6 months post-operative

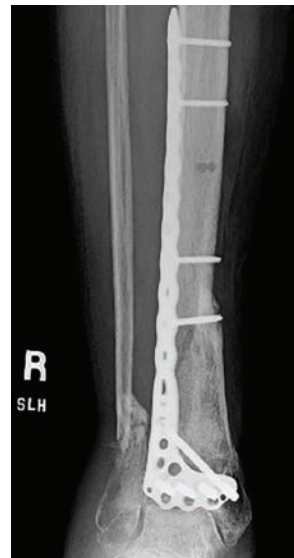


Figure 4B: 6 months post-operative



Figure 4C: 6 months post-operative

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