

New Techniques and Emerging Evidence #NT19

Tibia

Treatment of Tibial Pilon and Plateau Fractures With Open Reduction and Internal Fixation and Adjunctive Amniotic Membrane

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Purpose: Tibial fractures are the most common long bone fractures and often present a challenge to surgeons. Despite the evolution of surgical techniques, postoperative complications, such as deep infection and nonunion, affect up to 24% of patients following surgical fixation. Thus, adjunctive surgical treatments that improve postoperative wound healing and reduce complications are of increasing interest. Amniotic membrane (AM) derived from the umbilical cord presents a valuable adjunctive treatment option in the management of traumatic injuries with significant soft-tissue damage, as AM has been shown to elicit anti-inflammatory and anti-scarring actions that may ultimately support wound healing.

Methods: This was a single-center, retrospective review of patients with tibial pilon or plateau fractures who underwent open reduction and internal fixation (ORIF) with adjunctive, ultra-thick AM (Clarix 1K; BioTissue) or micronized AM (Clarix Flo; BioTissue) with at least 6 months of postoperative follow-up.

Results: A total of 54 patients (29 male, 25 female) presented with open (n = 2) or closed (n = 32) Schatzker type III (n = 3), IV (n = 2), V (n = 17), or VI (n = 9) plateau fractures, and the remaining 20 cases had open (n = 7) or closed (n = 13) OTA/AO Type 43 B2 (n = 1), B3 (n = 1), C1 (n = 6), C2 (n = 4), or C3 (n = 8) pilon fractures. The average age and body mass index was 48.3 ± 15.1 years and 29.1 ± 6.1 kg/m², respectively, and common comorbidities included smoker (46%) and diabetes (15%). The patients underwent ORIF (n = 18) or staged ORIF (n = 36) with adjunctive, ultra-thick AM (n = 36), micronized AM (n = 17), or both (n = 1). At 6 months postoperatively, 8 patients (14.8%) had wound complications that required incision and drainage (n = 7), local wound care/antibiotics (n = 1), and hardware removal (n = 4). Superficial infection was noted in 4 (7.4%) of these cases, and deep infection was present in 3 cases (5.6%). Nonunion was observed in only one (1.9%) Grade IIIA open 43-C3 pilon fracture.

Conclusion: Adjunctive use of ultra-thick or micronized AM may help support wound healing and reduce complications such as deep infection and nonunion following ORIF for tibial fractures.