

The 2-Window Posterolateral Approach for Ankle Fracture Repair is Associated with a Greater Incidence of Early Wound Complications than the Single-Window Approach

Christopher Gabriel Herbosa, BS; Kenneth A. Egol, MD; Philipp Leucht, MD; Nirmal C. Tejwani, MD, FRCS

NYU Langone Orthopedic Hospital, New York, New York, UNITED STATES

Purpose: Our purpose was to compare outcomes including wound complications following direct repair of unstable rotational ankle fracture with the posterolateral approach utilizing either 1 or 2 surgical windows. We hypothesize that the 2-window approach will be noninferior in outcome measures and wound complications.

Methods: 164 patients with bi- or trimalleolar ankle fractures who underwent open reduction and internal fixation (ORIF) in the prone position through the posterolateral approach were retrospectively analyzed. 108 (65.9%) were treated using the single-window approach (between peroneals and flexor hallucis longus [FHL]) for fixation of the posterior and the lateral malleolus while the 2-window technique (between peroneals and FHL for posterior malleolus fixation and lateral to peroneals for lateral malleolus fixation) was utilized with 56 patients (34.1%). Radiographic imaging was assessed for injury characteristics and fracture healing. Wound and general complications, range of ankle motion, fracture healing, and reoperations served as the primary outcome measures. Patients with at least 12-month follow-up were considered for functional outcomes.

Results: Ankles in the 2-window group had a significantly higher incidence of early (3 months post-surgery) wound complications (32.2% vs 12.0%, $P = 0.002$). Fractures with associated dislocation treated through the 2-window approach also had more frequent wound complications (36.1% vs 15.3%, $P = 0.019$). Patients treated earlier (within 1 week of injury) had a lower incidence of wound complications (12.7% vs 24.7%, $P = 0.049$). Those treated later (outside 1 week of injury) had more wound complications in the 2-window cohort (44.4% vs 15.5%, $P = 0.004$). Only 2 patients developed deep infection requiring surgical intervention; both were fixed using the 2-window approach (3.6% vs 0%, $P = 0.048$). Single-window patients had increased plantar flexion (35.0° vs 29.8°, $P = 0.044$) and dorsiflexion (21.2° vs 16.3°, $P = 0.040$) at 1-year follow-up. No difference in need for removal of hardware was observed between the single- and 2-window methods (12.5% vs 25.9%, $P = 0.115$). There was more sensory nerve complications in the single-window approach (9.4% vs 3.7%, $P = 0.354$; not significant).

Conclusion: We found a higher incidence of early superficial wound complications among ankle fractures treated through the 2-window posterolateral approach as well as among patients with fracture dislocations. We recommend using a single window, if appropriate, to approach the fibula and posterior malleolus when performing a posterolateral approach to the ankle for fixation of an unstable rotational ankle fracture.