New Techniques and Emerging Evidence #NT5

Clinical Cases, Solutions, and Novel Techniques

Triangular Elevation and Distraction (TED) Frame: A Tubular External Fixator Design for Fractures Around the Ankle Joint

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Purpose: Injuries around the ankle joint are often associated with extensive soft-tissue involvement. Two important components of soft-tissue management for these fractures are lower limb elevation and fracture site distraction. With the available methods and techniques for soft-tissue management, no single method is found to be effective in providing simultaneous limb elevation and fracture distraction. Thus, we propose use of a triangular elevation and distraction (TED) frame, as a novel frame design of tubular external fixator for soft-tissue management.

Methods: The data of patients admitted with pilon fracture (AO/OTA-43 B, 43C) from January 2017 to December 2019 were retrospectively collected from the hospital records. During the above-mentioned period, 105 patients with pilon fracture (AO/OTA-43 B, 43C) were admitted and out of these, 63 patients fulfilled the inclusion criteria. All these patients were given either TED frame or Bohler Braun splint along with calcaneum pin traction (BBSCPT) for the initial management.

Results: 30 patients were managed with the TED frame and 33 with BBSCPT for preoperative soft-tissue resolution. The mean time for swelling subsidence after application of TED frame was 75.9 + 14.7 hours (mean ± standard deviation) compared to 117.5 ± 25.9 hours required in BBSCPT group. Time required for soft-tissue resolution in AO/OTA 43-B fractures was significantly less in the TED frame group (68.7 ± 13.2 hours, compared to BBSCPT group 102.4 ± 15.4 hours). Swelling subsidence was also noted significantly earlier in AO/OTA 43-C fractures managed with TED frame 84.2 ± 12 hours compared to 135.7 ± 24.3 hours with BBSCPT).

Conclusion: This novel TED frame design is an economical, effective, easy to apply solution convenient for the management of soft-tissue component in fractures around the ankle. With a simple design and readily available components this frame can be applied in a quick time in any emergency department under local anesthesia.

Application of this frame can help in better mobilization and bedside nursing care of patients with ankle fractures during perioperative period with marked improvement in soft-tissue management.