Tibial Fracture Management and Outcomes with Single or Dual-Incision Fasciotomy

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Purpose: Single or dual incision techniques for fasciotomies of the leg are well described and commonly performed in the setting of acute compartment syndrome (ACS). However, creating a fasciotomy wound adjacent to a fracture disturbs the local biology, may introduce difficulties in fracture approach or fixation, and create an increased risk for infection. This study evaluates the relationship of fasciotomy technique with fracture fixation choices and subsequent wound management.

Methods: A retrospective chart review was performed of 314 patients presenting to a single Level I trauma center who underwent either single or dual incision fasciotomy of the leg over an 8-year period. Inclusion in final review included having a tibia fracture in addition to complete 4-compartment fasciotomy without subsequent amputation or death. Fasciotomy wounds underwent similar postoperative care. Demographic, mechanistic, and operative details were collected for all patients, as well as fasciotomy wound management, need for split-thickness skin graft (STSG), and fasciotomy wound use for fracture reduction and instrumentation. Descriptive statistics, chi-squared, Fisher's exact, and 1-way analysis of variance tests with post hoc analysis were performed for appropriate variables.

Results: Of 314 patients reviewed, 65 had a tibial fracture in conjunction with leg fasciotomy. Single (46, 71%) or dual (19, 29%) incision fasciotomy had no correlation with fracture type, union, or infection rate. Of patients who had reduction and fixation performed through a fasciotomy wound (single: 19, 41%, dual: 10, 53%), no increase in complication rate was noted ($P = 0.32$). Standard subsequent surgical approaches for definitive fracture fixation were performed in nearly all cases. STSG was performed in 54% of single and 63% dual incision cases, with medial wounds in the dual group able to be closed quicker than lateral (mean 4.2 vs 8.1 days, $P = 0.04$).

Conclusion: Of patients with tibia fractures in the setting of ACS, no increase in complication rate was observed with reduction and instrumentation through the fasciotomy wound. Additionally, standard surgical approaches for internal fixation can be used successfully following either single or dual incision fasciotomy. Good outcomes were observed in both single and dual-incision fasciotomies during tibia fracture management, with no significant difference between techniques.