

Optimizing Surgical Time in Orthoplastic Treatment of Open Tibial Fractures

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Purpose: We sought to describe a streamlined surgical set-up for simultaneous definitive orthopaedic and plastic surgery on open tibial fractures, routinely allowing for fracture fixation and free flap coverage within a standard operating day.

Methods: Patients with open tibial fractures initially undergo first stage debridement and temporary fracture stabilization, before returning within 72 hours for definitive fixation and soft tissue coverage. We describe in detail the practicalities for optimizing simultaneous working of orthopaedic and plastic surgical teams for our most common second stage procedure for open tibial fractures—secondary debridement, temporary stabilization, intramedullary fracture fixation, and free vascularized soft-tissue coverage.

Results: In the last 5 years, we have treated over 250 patients with open tibial fractures according to these principles and techniques. Free flap coverage has predominantly involved anterolateral thigh (69%) or gracilis (14%) flaps. All patients were operated on a dedicated orthoplastic list, with a standard surgical team of 2 orthopaedic and 2 plastic surgeons—commonly an attending and fellow/resident for each specialty. Patient positioning, flap donor site marking, and draping are all carefully planned to allow simultaneous orthopaedic instrumentation, unimpeded image intensifier use, and free flap harvest. One plastic surgeon identifies the acceptor vessels in the injured limb, while the other starts raising a flap from the contralateral side. Once suitable vessels are identified, the orthopaedic team removes the previous temporary stabilization, and completes a second debridement and washout, before reducing the fracture and holding with mini-fragment plating positioned to allow intramedullary fixation. This allows for suprapatellar nailing to be performed with the leg in a static position on a block, with concurrent work on the flap pedicle. By completion of definitive fixation, the flap has been raised and checked for viability. This allows the plastic surgeons to proceed to free flap transfer and microvascular work with minimal delay. Median operative time for the entire procedure is 360 minutes (interquartile range, 120), allowing completion within a standard operating day.

Conclusion: Combined orthoplastic operating systems have often been hampered due to issues with logistics, operating room timing, and staff availability. Over the past decade, we have refined a process of combined surgical management for open tibial fractures, to maximize efficiency and improve surgical outcomes.