

Introduction

39-year-old schizophrenic female was thought to have mental status changes resulting in her being immobile on the floor. She was found unresponsive presumably for five days. Nonoliguric acute renal failure (ARF) secondary to massive rhabdomyolysis (CPK 74660 unit/L) developed; secondary to a delayed presentation left thigh compartment syndrome (CS), bilateral four-compartment leg CS, right foot CS. Emergent fasciotomies and arterial thrombectomies were required. She sustained severe sensory and motor deficits to the bilateral legs and large wound defects. Serial debridements with negative pressure wound therapy with instillation (NPWT) were performed until split thickness skin grafts (STSG) could be applied. Left ankle arthrodesis was required due to dense motor deficits, assisted by the use of external fixation, which allowed early mobilization. Upon recovery, an ankle foot orthosis (AFO) allowed community ambulation.

Methods

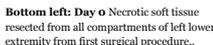
Emergent fasciotomies were performed on diagnosis day 0 to both lower extremities: left tibialis anterior and dorsalis pedis arterial thrombectomies of the anterior tibial and dorsalis pedis arteries were performed with immediate return of Doppler signals. The right lower extremity (LE) required a tarsal tunnel release, posterior tibial artery sympathectomy. Multiple muscle kampf; soft tissue debridements were required (n=6) to remove continued tissue necrosis. After extubation on day 2, sensory deficits remained to both LE. Permanent motor function loss to left ankle joint from muscle necrosis. Immediately post fasciotomy, defects measured 800 cm² total. Multiple sequential surgical debridements were performed to all compartments every 3-5 days with NPWT application. NPWT of 0.25% acetic acid, hypochlorous acid and saline aided granulation. Intraoperative cultures grew E. coli, S. maltophilia, C. glabrata, treated with levofloxacin and micafungin. Collagen powder and decellularized dermal allograft used topically once repeat operative cultures proved negative. Subsequently, left ankle joint fusion was performed for drop foot to prevent equinus. External fixation applied on day 36 provided wound offloading during healing and allowed immediate supervised weight-bearing ambulation with a walker. After sufficient wound granulation was noted and defects measured 175 cm² or less, a STSG was applied (day 79). A custom AFO was made to allow independent ambulation of the right LE drop foot, which slowly resolved. The EF was removed 3 months post discharge from the hospital. Following removal of the EF, she was able to ambulate with an AFO to bilateral LE.

Financial Disclosures: None to declare

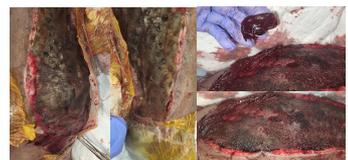
Case Study



Left: Day 0 Initial presentation in the emergency room with severe swelling, necrotic skin edges, pallor and nonpalpable pedal pulses. She was taken for an emergent 4 compartment fasciotomy the same day.



Right: Day 2 Patient underwent thrombectomy of the AT and DP arteries with microsurgical closure arteriotomy resulting in full doppler signals of the AT and DP pulses. NPWT of 0.25% acetic acid, hypochlorous acid, and saline was applied intraoperatively.



Day 9: A third surgery was performed to reset necrosis of musculature and soft tissue to the anterior and deep posterior compartments; partial skin necrosis to the dorsal foot and posterior calf were also resected.

Case Study Continued



Day 30: Fifth surgical debridement was performed with use of collagen powder and decellularized dermal allograft used topically. Due to maceration of tissues, saline dressings were applied for a 'vac holiday.'

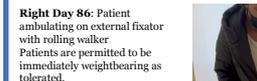
Day 35: All compartments were surgically debrided in sixth surgery.



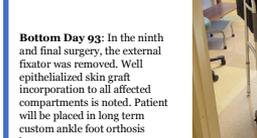
Day 62: Above photos from first outpatient follow up since hospital discharge 7 days prior. Wound bed granular, awaiting split thickness skin graft preparation.



Left Day 79: In the eighth surgery, split thickness skin grafts were applied to affected compartments. Ankle joint fusion was assisted by modifications to external fixator.



Right Day 86: Patient ambulating on external fixator with rolling walker. Patients are permitted to be immediately weightbearing as tolerated.



Bottom Day 93: In the ninth and final surgery, the external fixator was removed. Well epithelialized skin graft incorporation to all affected compartments is noted. Patient will be placed in long term custom ankle-foot orthosis brace.



Results

Upon discharge from the hospital, patient was ambulatory with external fixator (EF) on the left LE. The EF was removed and she was able to ambulate in bilateral custom ankle foot orthoses (AFOs). At seven months follow up, she has retained successful bilateral limb status. The initial soft tissue defects of bilateral lower extremities after the fasciotomies totaled 800 cm² total. After serial surgical debridements, NPWT of 0.25% acetic acid, hypochlorous acid and saline, selective antibiotic treatment, use of collagen powder and decellularized dermal allograft (once cultures proved negative), the soft tissue defects measured 175 cm² or less; STSG was then applied and was fully incorporated at time EF removal.

Discussion

Debridements yielded viable tissue, yet massive defects remained, especially to the medial compartment. Thrombectomy and microsurgical repair of the anterior tibial and dorsalis pedis arteries in the first debridement surgery was successful. The left lower extremity was non-functional with loss of sensation from knee joint to distal toes and loss of ankle motion prior to surgery which never returned. Once defects granulated sufficiently with NPWT, complete closure was achieved with split thickness skin autograft (STSG) and external fixation removal.

References

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