What is the success rate of primary repair of heel pad degloving injuries?

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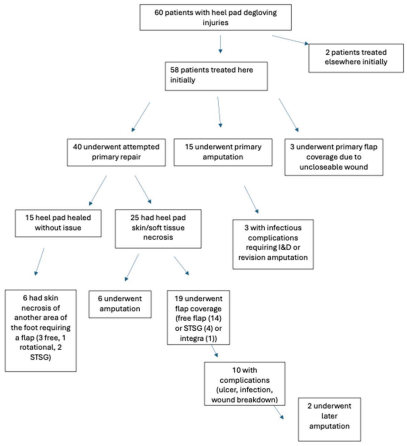
INTRODUCTION:
The literature on heel pad degloving injuries has been limited to case series, most including 5 patients or fewer. The purpose of this study was to report the outcomes of a large series of patients with heel pad degloving injuries at a single institution, particularly the outcomes of attempted heel pad repair, to compare various methods of heel pad fixation, and to report the percentage of patients that went on to need flap reconstructive surgery or amputation. Secondary purposes were to identify patient, injury, or treatment factors associated with successful repair.
METHODS:
This was a retrospective review of all patients admitted with an acute heel pad degloving injury between 2005-2024 at a single level level 1 academic trauma center. The primary outcome was successful repair of a heel pad degloving injury. Successful repair was defined as healing of the heel pad after primary repair, with no return to the operating room for secondary procedures. Secondary outcomes included need for flap coverage of the heel pad or other areas of the injured foot/ankle, and conversion to amputation.
RESULTS:
Sixty patients with heel pad degloving injuries were identified. Two were excluded due to primary repair of the heel pad injury at an outside institution, who followed up at this institution after developing repair failure. Fifty eight patients were included in the final cohort. The average age was 35 (standard deviation (SD) 17). Fifty (86%) were male. The mechanism of injury was a motorcycle collision in thirty cases (54%), a motor vehicle collision in 7 cases (13%), a fall from height in 2 cases (3%), and the remainder were due to a crush injury including the foot being run over by a bus (1), train (3), truck (4), forklift (2), snowmobile (1), heavy object (2), or lawnmower (5). Associated foot injuries included 11 Lisfranc disruptions, 10 Chopart joint disruptions, 17 calcaneus fractures, 6 talus fractures, 12 patients with metatarsal shaft fractures, and 9 patients with a variety of forefoot injuries (MTP, PIP, DIP dislocation or fracture dislocation). Only 8 patients had no fractures in the foot. Five patients had an associated vascular injury with a dysvascular foot. Forty patients (69%) were treated with an attempt at primary repair, three were treated with a primary flap due to an uncloseable wound, and 15 were treated with primary amputation. Of the patients who had a primary repair of the heel pad, 15 of these healed (15/40=38%). Repair method (suture alone, augmentation with k-wires, incisional wound vac) was not associated with repair success or failure. The 25 patients with failed primary repair all failed due to necrosis of the skin and/or tissue of the heel pad. Of these, 6 underwent secondary amputation, while 19 underwent attempted salvage with a flap (14), skin graft (4), or integra (1). Of the 19 with attempted salvage, 10 (53%) had complications including persistent ulceration, infection, and/or wound breakdown. Two of this cohort underwent secondary amputation. No patients in the successful primary repair group underwent later amputation.

DISCUSSION AND CONCLUSION:
Heel pad degloving injuries are devastating injuries with a high rate of complications. The rate of success after attempted primary repair was 38% in this series. The rate of secondary amputation was 20%. The rate of complication after secondary flap reconstruction was 53%. These findings can help counsel patients on expected outcomes after attempted primary repair as well as after flap coverage or amputation.


60 patients with heel pad degloving injuries
2 patients treated elsewhere initially
58 patients treated here initially
40 underwent attempted primary repair
15 underwent primary amputation
3 underwent primary flap coverage due to uncloseable wound
15 heel pad healed without issue
25 had heel pad skin/soft tissue necrosis
3 with infectious complications requiring I&D or revision amputation
6 had skin necrosis of another area of the foot requiring a flap (3 free, 1 rotational, 2 STSG)
6 underwent amputation
19 underwent flap coverage (free flap (14) or STSG (4) or integra (1))
10 with complications (ulcer, infection, wound breakdown)
2 underwent later amputation