

Anterior thigh avulsion injury with retained foreign body managed in a peripheral hospital: A surgical case report

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Abstract

Severe soft tissue trauma involving the thigh is a complex surgical challenge, particularly in remote or resource-limited settings. We present the case of a 32-year-old male with a large anterior thigh avulsion injury following a road traffic accident. The injury involved significant tissue loss and foreign material. Management included multiple debridements, foreign body removal, secondary suturing, and eventual split-thickness skin grafting. Post-operative recovery was uneventful, with long-term follow-up showing stable healing. This report underscores the importance of early intervention, serial debridement, and a stepwise reconstructive approach in the management of complex extremity trauma.

Keywords: Thigh avulsion injury, foreign body removal, soft tissue trauma, split-thickness skin graft, serial debridement

Introduction

Avulsion injuries of the thigh, particularly involving extensive soft tissue damage and embedded foreign bodies, present a significant surgical challenge. These injuries are typically caused by high-energy trauma, including road traffic accidents (RTAs), and often require a multi-staged surgical approach. In settings such as small peripheral hospitals, access to specialized surgical services like Negative Pressure Wound Therapy may be limited, further complicating management. Timely and effective surgical intervention is crucial to prevent infection, preserve limb function and restore mobility. Management of such injuries includes early debridement, wound care, staged closure or grafting, and often prolonged rehabilitation. Our case report aims at highlighting stage wise surgeries and long-term healing.

Case Presentation

A 32-year-old male was referred from a forward care facility following a high-impact RTA that resulted in a large open wound on the right thigh (Figure 1). Initial presentation showed no bony injury on radiographs of the femur, knee, pelvis, or foot. He underwent emergency debridement and foreign body removal on the day of injury (Figure 2). A plastic foreign body measuring 6×3×0.5 cm was embedded in the superior wound margin (Figure 3). Intra-operative measurements showed the wound to be approximately 30×15×5 cm, with loss of skin, subcutaneous fat and muscle. The patient was managed with IV antibiotics, daily dressings, and nutritional support.

Second debridement was done after 04 days (Figure 4).

Secondary suturing was performed on day 7 post-injury. Intra operatively attempt was made to close the tissue defect as much as possible (Figure 5).

Approximately two weeks later, an 8×8 cm residual raw area remained, which was covered with a split-thickness skin graft harvested from the contralateral thigh (Figure 6). The patient had an uneventful recovery and was discharged.



Fig 1: Intra-operative image of anterior thigh avulsion injury during the first debridement

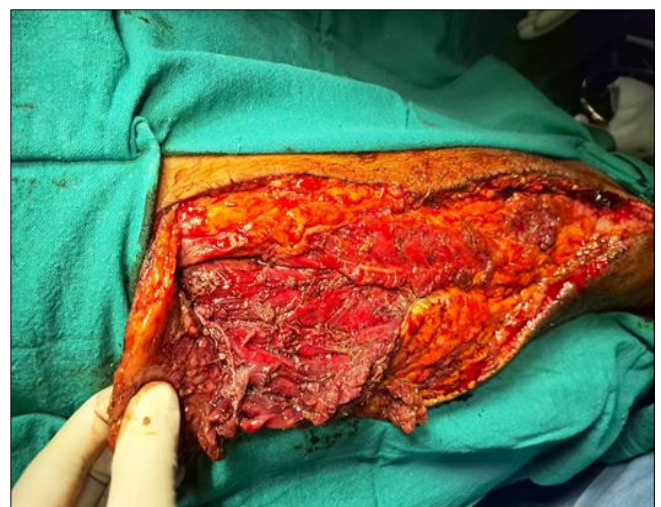


Fig 2: Intra-operative image of anterior thigh avulsion injury during the first debridement



Fig 3: Plastic foreign body embedded in the wound



Fig 4: Intra-operative photograph of the second debridement



Fig5: Remaining raw area after the secondary suturing



Fig 6: Postoperative progression after 03 weeks of Split thickness skin grafting



Fig 7: Stable wound after 05 weeks.

The mid thigh girth was measured at 05 weeks after the last surgery and found to be 03 cm lesser than the contralateral thigh (Figure 7). Patient is undergoing supervised physiotherapy and bulk building exercises.

Discussion

Extensive soft tissue avulsions of the anterior thigh remain a rare but formidable challenge in trauma surgery, particularly when accompanied by foreign body impaction and environmental contamination. Such injuries, often the result of high-energy trauma like vehicular accidents, demand a meticulous and often multi-staged operative strategy to optimize outcomes. In this case, the injury was compounded by the retention of a plastic foreign body and deep muscular exposure, necessitating prompt and repeated surgical intervention. The decision to initiate immediate exploration and debridement aligns with established best practices aimed at reducing bacterial load and removing necrotic tissue, thereby mitigating the risk of sepsis and delayed wound healing. Current literature supports that early intervention, ideally within the initial 6–12-hour window, significantly lowers infection rates and improves prognosis in open soft tissue trauma. [1, 2, 3]

Given the contaminated nature of the wound, a staged reconstructive approach was deemed most appropriate. Delayed primary closure followed by skin grafting remains a well-validated strategy, particularly in wounds with

granulation and absent active infection. ^[4, 5] In this case, the application of a split-thickness skin graft (SSG) yielded excellent graft uptake, consistent with previous studies affirming the reliability of SSGs in managing large surface area defects. ^[6, 7] The successful outcome also hinged on adequate vascular bed preparation, stringent aseptic dressing changes, and patient adherence to post-grafting care protocols.

Operating in a semi-arid, resource-constrained field hospital presented unique logistic and clinical challenges. Despite these constraints, the patient's favorable recovery—marked by early mobilization, minimal donor site morbidity, and functional limb preservation—underscores the efficacy of basic surgical principles when rigorously applied. Nutritional optimization, particularly protein and micronutrient repletion, likely contributed to enhanced epithelialization and immune function. ^[8, 9] Hypertrophic scarring observed during follow-up was expected, especially in dynamic regions like the thigh. However, the absence of contracture or functional impairment at four weeks post-grafting reflects satisfactory biomechanical integration of the graft. ^[10, 11] No foreign body granuloma or delayed inflammation was encountered, a known risk in cases involving synthetic or plastic debris. ^[12]

Conclusion

This case underscores that complex soft tissue injuries, including large anterior thigh avulsions complicated by foreign body retention, can be managed effectively with a structured and staged surgical approach. Key elements contributing to a successful outcome included early and repeated debridement, delayed primary closure, split-thickness skin grafting, and meticulous post-operative wound care. Meticulous wound bed preparation and follow-up rehabilitation are key to restoring function and preventing complications. Surgeons operating in resource-limited or field-based environments must adopt flexible and practical strategies to optimize outcomes. Even in semi-rural or military field settings with constrained surgical infrastructure, adherence to core trauma and reconstructive principles can achieve limb preservation, prevent infection, and restore functional mobility. As demonstrated in this case, individualized care protocols, supported by vigilant follow-up and physiotherapeutic support, remain the cornerstone of modern wound management in challenging environments.

Author contribution

Lt Col (Dr) Indranuj Roy performed the surgery and drafted the report. Lt Col (Dr) Ikroop Sahota revised the manuscript.

References

1. Anglen JO, Wound irrigation in musculoskeletal injury. *J Am Acad Orthop Surg*,2001;9(4):219-226.
2. Friedrich LV, *et al.* Timing of surgical intervention and antibiotic prophylaxis in trauma-related open wounds. *Clin Infect Dis*,2003;36(6):763-771.
3. Owens BD, Wenke JC, Early wound irrigation improves the rate of soft tissue infection in open fractures. *J Trauma*,2008;64(2):310-314.
4. Banwell PE, Musgrave M. Topical negative pressure therapy mechanisms indications. *Int Wound J*,2004;1(2):95-106.
5. Saxena V. Hwang CW, Huang S. Eichbaum Q. Ingber D. Orgill DP, Vacuum-assisted closure microdeformations of wounds cell proliferation. *Plast Reconstr Surg*,2004;114(5):1086-1096.
6. Pham C. Greenwood J. Cleland H. Woodruff P. Maddern G. Bioengineered skin substitutes for the management of burns a systematic review. *Burns*,2007;33(8):946-957.
7. Bassetto F. *et al.* Split-thickness skin grafts full-thickness skin grafts G. *Ital Dermatol Venereol*,2009;144(2):163-168.
8. Godina M. Early microsurgical reconstruction of complex trauma of the extremities. *Plast Reconstr Surg*,1986;78(3):285-292.
9. Kdous M. *et al.* Management of soft tissue loss in open fractures of the lower limb. *Tunis Med*,2010;88(10):729-732.
10. Mok S. Kimmel HM, Govindarajan V. Kirsner RS, Wound healing in older adults. *JAMA Dermatol*,2016;152(7):819-825.
11. Zhang Y. *et al.* Clinical efficacy of split-thickness skin grafts for treatment of extensive skin defects a retrospective cohort study. *Medicine (Baltimore)*,2019;98(21):15742.
12. Engdahl R. *et al.* Foreign body retention in traumatic injuries implications for wound healing complications. *J Emerg Trauma Shock*,2021;14(3):178-183.