

Limb salvage in a septic lower limb from burn injury: a case report

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Summary

Amputation is an uncommon consequence of burn injuries, with electrical and flame burns as common causes. While amputation may be life-saving, it significantly impacts quality of life, mobility, and psychological well-being. We present a case of a patient referred with a septic, full-thickness burn to the right lower limb, where amputation was advised. Despite poor prognostic signs and multidisciplinary input recommending above-knee amputation, a joint decision between the patient and burns team was made to attempt limb salvage. Through multiple debridements, negative pressure therapy (NPT), and reconstructive procedures, limb function was successfully preserved, with the patient regaining independent ambulation.

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Figure 1: Left and right images show the burns of the right leg on initial referral

Case report

On 1 February 2023, a male patient presented to the Burns Unit at Robert Mangaliso Sobukwe Hospital, Kimberley, with a septic right lower leg. He sustained a full-thickness scald injury from radiator water during a motor vehicle accident on 15 January 2023. Initial treatment was rendered at a district hospital before referral.

On arrival, clinical and photographic assessment confirmed extensive full-thickness burns with surrounding cellulitis and tissue necrosis (Figure 1). An emergency debridement was performed, and a negative pressure wound therapy dressing was applied. The viability of the limb remained uncertain postoperatively due to the extensive tissue debridement, which compromised the limb's blood supply. Additionally, there was also a concern about whether effective infection control could be achieved for the wound. The patient was managed with intravenous antibiotics.

On review, and after removal of the negative pressure therapy (NPT) dressing, the general surgery team recommended an above-knee amputation due to the presumed non-viability of the

limb, attributed to the extensive tissue loss and anticipated ischaemic complications resulting from the debridement (Figures 2 and 3). After a thorough discussion with the patient, the burns and plastic surgery team decided to pursue limb salvage.



Figure 2: Images of the right leg taken before the second debridement



Figure 3: Image of the right leg with a negative pressure wound therapy dressing after the second debridement

The patient underwent serial debridements, including resection of the entire posterior compartment musculature. Figure 4 shows the fourth debridement (20 April 2023), showcasing the exposed tibia and fibula with healthy granulation tissue beginning to form.

Following granulation coverage of the tibia, a split-thickness skin graft was applied. The orthopaedic team assisted with a fibular corticotomy to enhance graft take. However, the graft over the fibula failed, and the



Figure 4: Images of wounds after the fourth debridement



Figure 5: Outpatient follow-up images of the patient's right leg

patient was readmitted. A subsequent fibular osteotomy was performed, followed by NPT.

Final wound coverage was achieved with a second split-thickness skin graft. Physiotherapy was a critical component of care for this patient to achieve not only limb preservation but also functional rehabilitation. The patient achieved independent ambulation and was able to bear some weight on the salvaged limb, which is an outcome that would have been more difficult to attain if he had undergone an amputation (Figure 5). The patient did not receive any further skin grafting, and the chronic wound on the posterior leg continues to contract and close.

Discussion

Amputation in burn injuries remains a rare but devastating complication. A study at the University of North Carolina Jaycee Burn Center reported an amputation rate of 1.4% among 8 313 patients.¹ In contrast, the Pietermaritzburg Burn Service in South Africa reported a 3% rate.² Electrical burns are the leading cause of amputations in burn care, but flame burns also account for a significant proportion, particularly in adults.¹⁻⁵

Finger and toe amputations are the most common, followed by below-knee and above-knee amputations.¹ Regardless of level, limb loss has profound physical and psychological effects. Patients often experience anxiety, depression, and body image issues, sometimes lasting years after amputation.⁶

Lower limb amputation is particularly debilitating, with studies reporting significantly reduced quality of life among amputees.^{7,8} Preoperative functional status correlates with better postoperative outcomes; however, even well-functioning individuals suffer a decline in mobility.⁸ Employment is another challenge: while up to 66% of patients return to work, many cannot resume their original occupation.⁹

Given these outcomes, efforts to preserve the limb, when possible, are justified. In our case, the limb had minimal remaining functional muscle mass for plantarflexion. However, a multidisciplinary approach with surgical persistence, NPT wound management, and active rehabilitation enabled successful salvage.

The patient's active participation in decision-making was essential. Respecting autonomy while offering realistic goals ensured cooperation and psychological investment in recovery. Though resource-intensive, this approach culminated in a functional, pain-free, ambulatory limb – a superior alternative to prosthetic dependence following an above-knee amputation.

Conclusion

This case illustrates the importance of individualised care, especially in resource-constrained environments where outcomes such as prosthetic access may be limited. Limb salvage, when feasible, should always be weighed against amputation, considering not only medical feasibility but the broader psychosocial context.

Conflicts of interest

The authors declare no conflicts of interest.

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Ethical approval

Ethics approval and permission for publication were obtained from the Medical Director and Ethics Committee of Robert Mangaliso Sobukwe Hospital.

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