World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

Fatal rhabdomyolysis following high-voltage electrical injury with spontaneous lower-limb electro-amputation: A case report

Khalid El Jebbouri *, Achraf Lahjouji, houssam eddine Rachidi, Abdeljabbar Messoudi, Mohamed Rahmi and Mohamed Rafai

Department of Orthopedic and Trauma Surgery, Faculty of Medicine and Pharmacy of Casablanca, P32, Casablanca, Ibn Rochd University Hospital Center, Morocco.

World Journal of Advanced Research and Reviews, 2026, 29(01), 1212-1215

Publication history: Received on 07 December 2025; revised on 18 January 2026; accepted on 21 January 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.29.1.0106

Abstract

High-voltage electrical injuries are rare but devastating events, frequently associated with deep tissue destruction, vascular thrombosis, and severe systemic complications. Traumatic electro-amputation of a limb at the scene of the accident is exceptional and reflects the extreme severity of the injury. We report the case of a 24-year-old man with no prior medical history who sustained a high-voltage electrical injury resulting in spontaneous mid-leg amputation at the accident site. Despite early surgical management and intensive care, the patient developed severe rhabdomyolysis complicated by multiorgan failure, leading to death within 48 hours. This case highlights the pathophysiology, management challenges, and poor prognosis associated with high-voltage electrical trauma complicated by rhabdomyolysis.

Keywords: High-voltage electrical injury; Electro-amputation; Rhabdomyolysis; Multiorgan failure; Trauma surgery; Case report

1. Introduction

Electrical injuries represent a small proportion of traumatic admissions but are associated with high morbidity and mortality, particularly in high-voltage exposures (>1000 V) [1,3]. The severity of tissue damage is often underestimated because cutaneous lesions may be limited while deep muscular, vascular, and neural structures are extensively destroyed [2,4]. Massive muscle necrosis may lead to rhabdomyolysis, acute kidney injury, and multiorgan failure [6,7]. Traumatic or spontaneous limb amputation caused directly by electrical current, known as electro-amputation, is exceedingly rare and usually reflects catastrophic vascular and soft tissue damage [4,8]. We present a fatal case of high-voltage electrical injury with spontaneous lower-limb amputation, emphasizing diagnostic and therapeutic considerations.

2. Case Presentation

A 24-year-old man with no significant past medical history was admitted to the emergency department two hours after sustaining a high-voltage electrical injury at his workplace. The accident resulted in immediate traumatic amputation of the right lower limb at the mid-leg level at the scene.

On admission, the patient was conscious, hemodynamically and respiratory stable, with no cardiac rhythm disturbances on initial monitoring. Clinical examination (figure 1) revealed a traumatic amputation of the right lower limb at mid-leg

* Corresponding author: Khalid El Jebbouri

level, with exposed bone, extensive soft tissue destruction, and devitalized tissues. Second-degree burns were noted in the lumbar region. No other external injuries were identified.

Figure 1 Clinical appearance on admission showing a traumatic mid-leg amputation associated with second-degree burns of the lumbar region

Given the extent of necrotic lesions and clinical signs suggestive of severe vascular injury, the patient was transferred emergently to the operating room without prior radiological assessment. Surgical exploration (figure 2) revealed extensive muscle necrosis and multiple thromboses of the femoral artery. A completion amputation at the mid-thigh level was performed, associated with thorough surgical debridement. Concomitant debridement of the lumbar burn area was carried out.

Figure 2 Intraoperative view after lumbar necrosectomy and completion right mid-thigh amputation

Postoperatively, the patient was admitted to the intensive care unit for close monitoring. The clinical course was rapidly complicated by severe rhabdomyolysis, with subsequent multiorgan failure. Despite aggressive supportive management, the patient's condition deteriorated, and he died 48 hours after admission.

3. Discussion

High-voltage electrical injuries cause tissue damage through multiple mechanisms, including direct electrical effects, thermal injury, and vascular compromise [1,4]. Electrical current preferentially travels through tissues with low

resistance such as nerves, blood vessels, and muscles, leading to deep tissue destruction disproportionate to skin involvement [2,4].

Electro-amputation is an exceptional manifestation of electrical trauma. It is thought to result from a combination of intense thermal injury, explosive muscle necrosis, and acute vascular thrombosis [4,8]. In our case, the presence of multiple femoral artery thromboses supports the hypothesis of primary vascular injury leading to irreversible ischemia and tissue necrosis.

Rhabdomyolysis is a well-recognized and life-threatening complication of electrical injuries [6,7]. Massive muscle breakdown releases myoglobin, potassium, and other intracellular components into the circulation, leading to acute kidney injury, metabolic acidosis, cardiac arrhythmias, and ultimately multiorgan failure [6,7]. Early recognition and aggressive management, including high-volume fluid resuscitation and urine alkalinization, are essential but may be insufficient in cases of extensive muscle necrosis, as illustrated in this report.

The decision to proceed directly to surgical management without radiological imaging was justified by the obvious non-viability of the limb and the patient's stable condition, prioritizing rapid source control and prevention of further systemic toxicity [3,5]. However, despite timely surgical intervention and intensive care, mortality remains high in severe high-voltage electrical injuries complicated by rhabdomyolysis [1,3].

This case underscores the importance of early multidisciplinary management involving trauma surgeons, vascular surgeons, intensivists, and burn specialists [5]. It also highlights the need for heightened awareness of delayed systemic complications, even when initial hemodynamic stability is present.

4. Conclusion

High-voltage electrical injuries can result in catastrophic limb destruction and fatal systemic complications. Spontaneous electro-amputation is a marker of extreme injury severity and poor prognosis. Rhabdomyolysis remains a major determinant of mortality despite prompt surgical and intensive care management. Early recognition, aggressive treatment, and multidisciplinary care are essential, although outcomes may remain unfavorable in severe cases.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Statement of ethical approval

This study was conducted in accordance with the ethical standards of the institutional and/or national research committee and with the principles of the Declaration of Helsinki.

Written informed consent for publication of the case details and accompanying clinical images was obtained from the patient's legal relatives. Patient anonymity has been strictly preserved, and no identifying information is disclosed in this manuscript.

Formal ethical committee approval was not required for this case report, in accordance with local regulations.

Statement of informed consent

Written informed consent for publication of this case report and any accompanying images was obtained from the patient's family. All identifying information has been anonymized to ensure confidentiality. A copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

Author Declaration

All authors confirm that they have made substantial contributions to the conception, data acquisition, analysis, and drafting of this manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

This manuscript is original, has not been published previously, and is not under consideration for publication elsewhere, in whole or in part.

Data Availability Statement

All data supporting the findings of this case report are included within the article.

References

[1] Koumbourlis AC. Electrical injuries. Crit Care Med. 2002;30(11 Suppl): S424–S430.

[2] Fish RM, Geddes LA. Conduction of electrical current to and through the human body: a review. Eplasty. 2009;9:e44.

[3] Arnoldo BD, Purdue GF, Kowalske K, Helm P, Burris A, Hunt JL. Electrical injuries: a 20-year review. J Burn Care Rehabil. 2004;25(6):479–484.

[4] Lee RC. Injury by electrical forces: pathophysiology, manifestations, and therapy. Curr Probl Surg. 1997;34(9):677–764.

[5] Saffle JR, Crandall A. Management of electrical injuries. Clin Plast Surg. 2009;36(4):507–518.

[6] Better OS, Abassi Z. Early fluid resuscitation in patients with rhabdomyolysis. Nat Rev Nephrol. 2011;7(7):416–422.

[7] Huerta-Alardín AL, Varon J, Marik PE. Bench-to-bedside review: Rhabdomyolysis – an overview for clinicians. Crit Care. 2005;9(2):158–169.

[8] Cooper MA. Electrical and lightning injuries. Emerg Med Clin North Am. 1984;2(3):489–501.