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High-voltage electrotrauma – unmasking the threat of early anaerobic infection

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To the Editor.

With this letter we would like to bring attention to a critical issue concerning burn patients, particularly those who have suffered electric burns and are at risk of developing anaerobic infections during the early stages of their hospital stay. The gravity of this matter necessitates immediate awareness and proactive measures within our healthcare system.

A 33-year-old male suffered polytrauma, including high-voltage electrotrauma. In a suicide attempt, he fell from a 3-meter-high power line pole after sustaining a high-voltage electrical injury. Due to the compartment syndrome, fasciotomy was performed on both upper limbs, followed by necrectomy of necrotic tissue (Fig. 1, 2). Upon admission, the patient underwent an examination within the overall polytrauma algorithm. The patient had abundant microbiological findings from the 1st day of admission and was facing an increased risk of anaerobic infection during the early stages of hospitalization. He underwent right forearm amputation because of the presence of clearly avital tissue and for the development of early *Clostridium sporogenes* and *Clostridium glycolicum* infection. Due to the process of necrosis of the distal part of the biceps, 2 weeks after the injury, further amputation of the upper right limb was necessary, performed simultaneously with left forearm amputation. In the next phase of treatment, the defects on the left upper limb were covered with skin autograft. Physiotherapy and mobilization of the fractures treated by a traumatologist were gradually performed. Upper limb amputation stumps and burned areas healed without defects. After 3 months of hospitalization, the patient was transferred to the district hospital for continued treatment and rehabilitation.

Electric burns, characterized by tissue damage resulting from electrical current passing through the body, present a unique set of challenges for both patients and healthcare providers [1,2]. What makes this situation even more alarming is the potential development of anaerobic infections, which thrive in environments devoid of oxygen [3].

The early stages of hospitalization are crucial for burn patients, as prompt and effective intervention can significantly impact their recovery. Anaerobic infections pose a serious threat in this con-

Fig. 1. Right upper limb after necrectomy and fasciotomy.

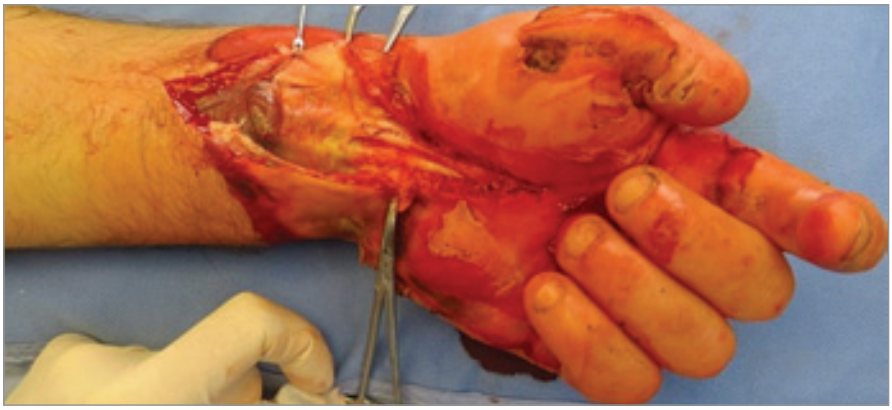

Fig. 2. Left upper limb after necrectomy and fasciotomy.

text, as they may not always manifest apparent symptoms, leading to delayed diagnosis and treatment.

Recognizing the unique challenges posed by high-voltage electrotrauma, healthcare professionals must pivot from traditional wound care methodologies to a more nuanced and comprehensive protocol. This not only facilitates accurate diagnosis and monitoring but also enables tailored interventions to mitigate the higher risk of anaerobic infections associated with these injuries. At our workplace, we routinely perform not only the swab technique but also the semiquantitative imprint technique to assess the microbiological situation in the burned area [4]. However, with this method, the detection of anaerobic bacterial populations might be less reliable. Embracing more advanced (though invasive) techniques, such as quantitative wound biopsy, underscores the commitment to precision and thoroughness in managing these complex cases [5,6]. In the realm of high-voltage electrotrauma, this adapted approach to wound assessment and diagnosis is pivotal, serving as a cornerstone for optimizing patient outcomes and minimizing the potential complications inherent in such severe injuries.

Roles of the authors

Júlia Bartková – conception and design, analysis and interpretation, data collection, writing the article;
Filip Raška – critical revision of the article;
Lukáš Vacek – critical revision of the article;
Christos Tsagkaris – critical revision of the article;
Břetislav Lipový – conceiving and designing the study, critical revision of the article.
Each author certifies that he/she has made a direct and substantial contribution to the work reported in the manuscript by participating in each of the following three areas: 1) conceiving and designing the study; or collecting the data; or analyzing and interpreting the data; 2) writing the manuscript or providing critical revisions that are important for the intellectual content; and 3) approving the final version of the manuscript.

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