

Negative Pressure Wound Therapy (NPWT) to Treat Complex Defect of the Leg after Electrical Burn

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Abstract

Negative pressure wound therapy is a non-invasive treatment that uses under atmospheric pressure to increase blood supply to the wound, stimulating the formation of granulation tissue, angiogenesis, proliferation of fibroblasts and endothelial cells. Negative pressure therapy has also the ability to decrease the bacterial load, reduce swelling and decrease exudate while maintaining a moist environment that facilitates healing. Our patient, a 17 year old male, suffered major third and fourth-degree high voltage electrical burns on 60% of the body surface, in November 2011. After the excision of the necrotic tissue (muscles and tendons), the lower extremity of the right leg- the tibial bone, the fibula, external and internal malleoli became exposed circularly. The soft-tissue defect was partially covered by using an internal twin muscle flap and free split skin. Then, a cross leg flap technique has been used, partially covering the defect with a contralateral thigh flap. Surface swab cultures were positive for *Pseudomonas aeruginosa*. In October 2013 the patient was transferred to our department. The clinical examination of the right leg showed that the tibial bone had been exposed on an area of 15/3 cm in the lower half. The peroneal malleolus had also been exposed. The resection of the devitalized, exposed tibia and the avivement of the wound edges were performed. Then the NPWT was started and performed by intermittent suction. Local cleansing, soft-tissue avivement and dressing changes were performed twice a week for 6 weeks. After six weeks of NPWT and eleven dressing changes under general anaesthesia, the wounds were ready for skin grafting. Granulation tissue was formed, covering the entire surface of both the tibia bone and the peroneal malleolus. Both receptor beds were covered with free skin graft harvested from the ipsilateral thigh. The mechanical suture of the skin grafts was performed and the grafts were covered with damp dressing. By using the NPWT it was possible to cover major chronic soft tissue defects, thus avoiding the amputation of the member.

Key words: negative-pressure therapy, antibacterial effect, children, wound healing, chronic wound