

Escharotomy with an Enzymatic Debridement Agent for Treating Experimental Burn-Induced Compartment Syndrome in an Animal Model

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Abstract

Background:

In patients with deep circumferential burns, adequate resolution of burn-induced compartment syndrome (BICS) is achieved by surgical escharotomy. Surgical escharotomy is traumatic, may cause considerable blood loss, does nothing toward debridement of the burn wound, and entails possible morbidity and complications. Debridase® is a bromelain-derived enzymatic preparation capable of lysing the burn eschar within 4 hours, obviating the need for surgical debridement. It has an affinity to burned necrotic tissue and does not damage healthy skin. In our clinical assessment of its efficacy, we found in several cases of deep burns of the limbs that the measured intracompartmental pressure subsided after 2–4 hours of Debridase® application, and none of the enzymatic escharotomy–treated patients suffering from circumferential burns developed BICS. To confirm these observations, we conducted this controlled study.

Methods:

A model for BICS was developed by making circumferential burns to pig legs and monitoring the anterior compartment of the legs. BICS was induced in the legs of 5 pigs (20 legs); 10 legs were treated with Debridase® and 10 served as nontreated controls, treated by surgical escharotomy at the conclusion of the experiment.

Results:

Debridase reduced BICS within 30 minutes from application. Debridase was as effective as a standard surgical escharotomy.

Conclusion:

Escharectomy with an effective enzymatic debriding agent is potentially an adequate, simple, fast, effective procedure to treat BICS; it has the added benefit of burn debridement without surgical escharotomy.