

NexoBrid enzymatic debridement of chronic wounds: Preliminary results

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Introduction

Chronic hard-to-heal wounds that plague 1-1.5 % of the industrialized world population represent a major health burden, contributing to substantial disability, morbidity and cost (2-4% of the health care budget). In less affluent countries such wounds often cause slow and painful death to the patients. Treatment of such wounds starts with the removal of dead tissue, debris and slough: debridement or wound bed preparation (WBP). Surgical WBP is demanding and traumatic and non surgical agents used at present in chronic/hard to heal wounds are slow and/or inefficient, requiring many days if not weeks to prepare the wound bed for closure. A fast and effective WBP agent that can complete this process in a few applications may open a new era in the care of these wounds. A concentrate of proteolytic enzymes enriched with Bromelain: NexoBrid® (NXB) been found to be effective, fast and safe in debriding deep burns in a single 4 hour topical application. It has been approved for the debridement of deep burns in Europe, Israel, Argentina and in other countries is under registration. This is a presentation of a proof of concept WBP study assessing the efficacy and safety of NXB in chronic/hard-to-heal wounds.

Material & Methods

This is a summary of a prospective, single arm, multicenter, preliminary study, exploring the efficacy and safety of NXB in 24 Patients suffering from chronic, hard-to-heal wounds of different etiologies. The patients had the following etiologies: venous ulcers (n=6), peripheral vascular disease (n=4), post traumatic (n=6) and post surgical necrosis (n=3), ulcer in lymphedema skin (n=2), diabetic foot ulcer (n=1), pressure sore (n=1) and ulcer of chronic steroid treated skin (n=1). Following 30-60 minutes of local anesthetic gel, the patients were treated with consecutive 4 hour applications of NXB (lyophilized enzymes mixed in a carrier gel, applied onto the wound in an occlusive dressing). NXB dressings were changed every 4 hours in order to monitor local safety and continued until sufficient WBP for wound closure was achieved as judged by the investigators. If two NXB consecutive applications were not effective at all, treatment was discontinued. As soon as the wound bed was deemed ready for closure (WBP) the wounds were treated towards closure by autografting or non surgically (scarring & epithelialization).

Results

- The gross average NXB efficacy in all patients:
 - All wounds 68% WBP completed
 - Average treatment of 14 hours exposure (HE)
- Effective NXB WBP was found to be (WBP in average HE):
 - Venous ulcers (n=6): 82% WBP in 17 HE
 - Post traumatic necrosis (n=6): 90% WBP in 7 HE
 - Diabetic foot ulcer (n=1): 95% WBP in 8 HE
 - Lymphedema skin ulcer (n=3): 78%WBP in 22 HE
 - Pressure sore (n=1): 95% WBP in 8 HE
 - Ulcer in chronic steroid patients (n=1): 70% WBP in 12 HE
- NXB was less effective:
 - PVD with dry adherent eschar (n=4): < 30% WBP in 12 HE
 - Post surgery dry adherent eschar (n=3): < 40% WBP in 21.5HE

Discussion

This was a concept validation, exploratory study aimed to assess the safety and efficacy of NXB in a new field of chronic wounds. The overlapping of etiologies and heterogeneity of conditions in "real life" is the reason to try NXB in such etiologies in order to assess this new technology's perimeters. As a preliminary explorative study this cohort is very small, not allowing statistical analysis but nevertheless, points clearly to indications where NXB seems to be more effective. Venous ulcers, diabetic foot ulcers, pressure sores, various trauma on problematic skin (lymphedema, steroid Rx) were well debrided in a few hours allowing early closure. Despite the sick skin and patients as well as the NXB fast activity, no significant AEs were reported. NXB in such wounds acts differently than in burns requiring several application and being less effective in very dry, leathery eschar.

Conclusion & Applicability to Practice

NXB has been found in this study to be safe, fast and effective debridement/WBP means in several etiologies of chronic and hard to heal wounds. Modified Bromelain based formulations may suit patients with different needs and treatment strategies. Additional studies with larger groups of patients in each etiology are needed to establish more accurately its clinical potential.

Case studies

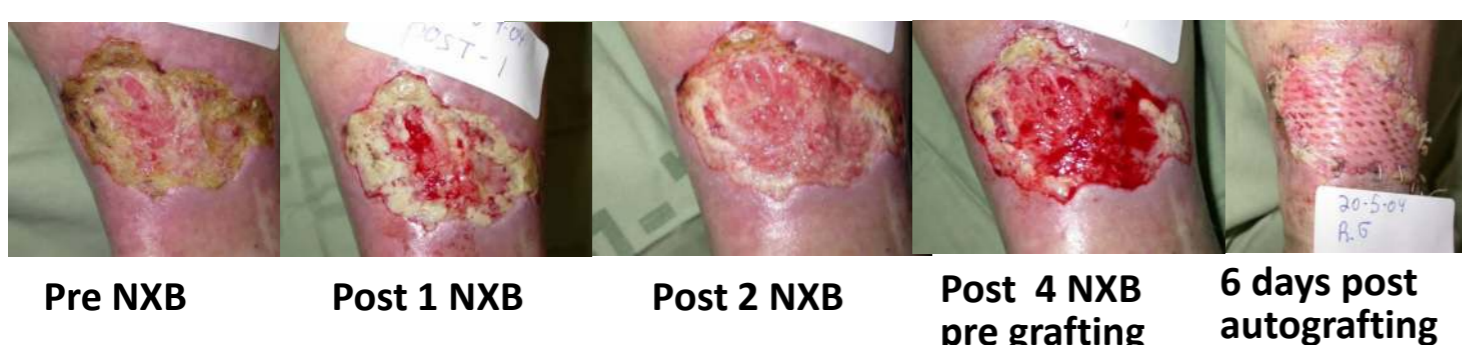
Three months old diabetic foot ulcer. After one 4 hours NXB application (4 exposure hours) eschar from one wound was peeled off and after the second application (additional 4 hours) also the second eschar, with complete WBP in total 8 exposure hours.



Four months old pressure sore surrounded by cellulites selectively & completely debrided by two 4 hours NXB applications (total 8 h.).



Five months old venous ulcer of a 63 y patient with diabetes & cardiac disease. After 4 NXB applications (16 exposure hours) WBP has been achieved and the patient was successfully autografted



Six week old car wheel trauma & necrosis in severe lymphedema leg. Good WBP (debridement & granulation) after 4 NXB applications (total 16 hours) allowing closure by scraping and autografting

