Case Report
Ischemia Related Gangrene Wound

NovoSorb® BTM
Biodegradable Temporising Matrix

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Ischemic wound with exposed tendons underwent treatment with NovoSorb® BTM to form a granulating neodermis.

Patient with critical limb ischemia, presented with left foot plantar gangrene. Post revascularisation with angioplasty, the wound was non-inducive for wound healing. Initial debridement of the gangrene left a significant tissue deficit with exposed flexor tendons. After a poor response to initial treatment with negative pressure wound therapy, NovoSorb BTM was used to facilitate wound healing to avoid major amputation. Post delamination of the sealing membrane, an epidermal graft was applied over the neodermis, which eventually went on to successfully epithelialise, salvaging the limb.

Figure 1: Day 8 post initial debridement. Treated with NPWT before application of NovoSorb BTM.

Figure 2: Day 21 post NovoSorb BTM application. Appearing integrated except distally over the tendon.

Figure 3: Day 45 post NovoSorb BTM application, prior to epidermal grafting. Sealing membrane delaminated at day 24.

Figure 4: Day 48 post NovoSorb BTM application. Day of application of epidermal graft.

Figure 5: At 2 months post NovoSorb BTM application. Further granulation over the distal tendons.

Figure 6: Near-complete epithelialisation at 5 months post NovoSorb BTM application.

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Background

A 68-year-old male was admitted for left leg cellulitis, found to be related to a patch of dry gangrene on the plantar aspect of his left foot. Comorbidities included peripheral arterial disease, polymyalgia rheumatica, hypercholesteremia and glaucoma. Arterial investigations of lower limb perfusion revealed severe lower limb arterial disease requiring angioplasty to his tibioperoneal trunk and posterior tibial artery. However, the post-operative left hallux toe pressure was 23 mmHg, and deemed below the required threshold for wound healing.

Following revascularisation via angioplasty, the patient underwent initial debridement of the dry gangrene, leaving a significant tissue deficit on the plantar aspect of the left foot. The defect was sub-fascial in depth, with exposed flexor tendons in the distal portion of the wound bed. Cultures from the debrided tissue revealed a gram-negative bacillus, which was treated with intravenous antibiotics.

Treatment

The wound was initially treated with 8 days of topical negative pressure wound therapy (NPWT). However, tissue was slow to granulate over the exposed tendons, due in part to the residual ischemia (Fig. 1). With a poor response to NPWT, and no option for further revascularisation, the ongoing tissue deficit meant the patient was facing threat of proximal amputation. With the ongoing risk of amputation due to ischemia related to poor wound healing, a decision was made to use NovoSorb BTM in combination with NPWT in an attempt for limb salvage.

At 8 days post initial debridement, the patient was taken to theatre for further debridement and application of NovoSorb BTM with sutures. NPWT was applied intra-operatively over NovoSorb BTM, with a continuous treatment pressure of 50 mmHg. NPWT was utilised for a total of 14 days post application of NovoSorb BTM, with dressing changes performed every 7 days. Absorbent antimicrobial dressings in combination with topical antiseptic spray were employed following the initial 14 days of NPWT. Dressings were changed every second day until delamination of NovoSorb BTM's sealing membrane. At 21 days post-application, NovoSorb BTM appeared pink-red in colour, except for the distal portion over exposed tendons which remained a yellow colour (Fig. 2).

At 24 days post NovoSorb BTM application, the sealing membrane was delaminated, revealing a neodermis with approximately 75% tissue integration, with granulation tissue observed in all but the distal portion of the wound bed. Post-delamination of NovoSorb BTM's sealing membrane the wound was left for further healing via secondary intention with applied antimicrobial dressings and topical antiseptics. At 48 days post NovoSorb BTM application, >90% granulation tissue was observed, and an epidermal harvesting system was used to apply an epidermal graft over the granulating neodermis (Fig. 3, 4 & 5).

Outcome

Post epidermal graft application the patient was able to bear weight through the limb. At 5 months post NovoSorb BTM application, and despite significant peripheral arterial disease, near-complete epithelialisation was achieved (Fig. 6). Successful wound closure allowed the patient to retain lower limb and foot function and avoid major limb amputation.

NovoSorb BTM is designed to temporise the wound and facilitate the construction of a vascularised neodermis, ready for definitive closure.
NovoSorb BTM is indicated for full or deep partial thickness burns and wounds, surgical and reconstructive wounds and traumatic wounds.
For full device details, including indications, contraindications, warnings and precautions, refer to the Instructions For Use, available at **polynovo.com**

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