

Negative-pressure Wound Therapy for Periocular Necrotizing Fasciitis

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Summary: Periocular necrotizing fasciitis is a rare, but potentially blinding, or even fatal disease. The authors report a case of a 44-year-old man who presented with quiescent bilateral periocular and facial necrotizing fasciitis. The patient was treated with antibiotics and surgical debridement, followed by negative-pressure wound therapy (NPWT), until the wound bed was thought to be healthy enough to support bilateral upper eyelid full-thickness skin grafts. NPWT appeared to decrease local edema; speed reperfusion and granulation tissue formation; and served to stabilize the skin grafts against the wound bed, while not causing any ocular complications. NPWT can be a safe and effective adjunct treatment for periocular necrotizing fasciitis. (*Plast Reconstr Surg Glob Open* 2018;6:e1921; doi: 10.1097/GOX.0000000000001921; Published online 17 December 2018.)

In this report, the authors describe a patient who presented with subacute, quiescent bilateral periocular necrotizing fasciitis, and was treated successfully with surgical debridement, adjunctive negative-pressure wound therapy (NPWT), and delayed repair with full-thickness skin grafts.

CASE DETAILS

A 44-year-old African American man with poorly controlled type 2 diabetes mellitus, primary hypertension, and a history of substance abuse was transferred to our institution for presumed ACE inhibitor-induced facial angioedema. The patient reported that a few days before presentation, he had a tender and swollen eyelid nodule consistent with a hordeolum. He was admitted to the outside hospital and found to be in diabetic ketoacidosis. Blood cultures grew *S. pyogenes* and he was treated with intravenous vancomycin, piperacillin/tazobactam, clindamycin, and steroids. After 11 days without improvement of the facial edema, the patient was transferred to our hospital.

Upon transfer, the patient had boggy, nontender, non-erythematous soft-tissue edema extending from the crown

of his head to his neck, and periocular soft-tissue necrosis with large eschars on the upper eyelids and the lower lip (Fig. 1). His eyelids were swollen shut; his visual acuity was checked by manually opening the eyelids and was measured as count fingers at 2 feet in the right eye and 20/200 in the left eye. He had significant conjunctival chemosis. The remainder of his eye examination was normal, including extraocular motility and intraocular pressure. CT imaging showed extensive facial edema without extension into the orbit nor sinusitis. The patient was started on clindamycin, meropenem, and micafungin. The disease process appeared to be quiescent, with no further spread of edema and no pain.

After a week without improvement, he underwent a total of 4 serial debridements of devitalized bilateral periocular tissue every 2 days (Fig. 2). After the second debridement, NPWT was initiated at -75 mm Hg continuous suction across the eyelids with a tarsorrhaphy in place on each eyelid to ensure protection of the ocular surface and prevent contracture of the deeper eyelid tissue (Fig. 3). NPWT appeared to reduce the local edema and shrink the surface area of the wound. Wound cultures were negative and the debrided tissue showed necrosis on histopathological examination. The NPWT was maintained for 2 weeks, with dressing changes and examination of the ocular and periocular area every 2–3 days, until the wound bed was felt to be healthy enough to support a skin graft. Three weeks after his transfer to our hospital, the patient underwent bilateral upper lid full-thickness skin grafting with Frost suture tarsorrhaphy. NPWT was continued for 6 days after skin graft placement with dressing changes every 2 days. Three months after surgery, the patient had a nice result (Fig. 4), and his visual acuity was stable in the

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Fig. 1. Presentation of patient upon transfer from outside hospital.



Fig. 2. After surgical debridement of necrotic periocular tissue.



Fig. 3. Negative-pressure wound therapy applied to periocular area.



Fig. 4. Three months after full-thickness skin grafts to upper eyelids.

right eye, at count fingers at 2 feet, and had significantly improved in the left eye, to 20/25. He had some residual cicatricial ectropion of the right upper eyelid and underwent a second full-thickness skin graft to that eyelid and was subsequently lost to follow-up.

DISCUSSION

Periocular necrotizing fasciitis is a rare, but devastating entity. It commonly occurs in alcoholics, diabetics, and immunocompromised patients. It frequently stems from a local superficial infection, trauma, or surgery. The mortality rate for necrotizing fasciitis has been estimated as 12.5% if it involves the upper two-thirds of the face, and approaches 30% if it spreads to the cervical area.¹ NPWT is thought to promote wound healing by decreasing tissue edema, exudate and bacterial count while promoting angiogenesis, perfusion and granulation tissue formation.^{2,3} Although it is commonly used to treat wounds on the rest of the body, there may be reluctance to using it in the periocular area due to concern for it causing elevated intraocular pressure or damage to ocular structures. One study found that NPWT settings of -75 mm Hg and -150 mm Hg increased interstitial hydrostatic pressure by 8 mm Hg and

10 mm Hg, respectively.⁴ Semlacher et al.⁵ reported the first published case of using NPWT over the eyelid. Their patient's periocular necrotizing fasciitis was successfully treated with debridement, NPWT, and skin grafting, without harming the eye. They found that NPWT helped to encourage granulation tissue development in the intervals between serial surgical debridements, and then served to bolster and support the skin grafts once they were placed. Contreras-Ruiz et al.⁶ presented a series of 4 patients with periocular necrotizing fasciitis who were treated with debridement and NPWT. Two of the 4 did not require any surgical reconstruction after NPWT. The study concluded that periocular NPWT was safe and that it enabled faster recovery and reduced the number of serial debridements.

Our case also demonstrated the safety and efficacy of using NPWT as an adjunct therapy to debridement and skin grafting in periocular necrotizing fasciitis. Our case was notable because it was bilateral, and because of the delayed manner in which the patient presented to our hospital. NPWT had several beneficial effects to the wound bed: it seemed to encourage granulation tissue and reperfusion of the surrounding tissue, thereby speeding the time to when it was felt safe to place the skin graft; it decreased

local edema, thereby shrinking the wound bed; and it served to bolster the skin grafts against the wound bed.

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