

The Role of Negative Pressure Wound Therapy (NPWT) in the Management of Vasculitic Wounds: Case Series of Eight Patients

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Abstract

Vasculitic ulcers belong to the category of atypical ulcers and are traditionally very slow to heal. The aim of this study is to retrospectively analyze the files of eight patients with vasculitic ulcers treated with negative pressure wound therapy (NPWT). Immunosuppression was initiated at least two weeks prior to starting NPWT. We suggest that this is a safe and promising protocol to treat these hard-to-heal ulcers.

Keywords

Inflammatory ulcer, atypical ulcer, cutaneous vasculitis, negative pressure wound therapy

Introduction

Cutaneous vasculitis is defined as an inflammatory reaction of the vessel wall leading to vascular damage. Recently, a new nomenclature of cutaneous vasculitis has been published, that defines the systemic and cutaneous variants of medium-vessel and small vessel vasculitides.^{1,2} Cutaneous vasculitis typically has an acute course and immediate intervention therapy is needed to avoid further damage. Various immunosuppressive therapies are the cornerstone of treatment. Usually, high-dose systemic corticosteroid treatment is used to cope with acute vasculitis but long-term corticosteroid treatment has multiple side effects.³ Therefore, it is necessary to consider other treatment modalities with less systemic side-effects to curb the inflammatory reaction. Alternative treatment modalities include eg methotrexate, azathioprine, cyclosporine, mycophenolate mofetil, cyclophosphamide, and rituximab; and the treatment is modified according to the vasculitis type.^{2,4}

Normal wound healing is a complex biological process including interaction with different cell types and biochemical signals.⁵ Chronic wounds typically stagnate at the inflammatory phase, where wound healing is characterized by the release of cytokines and inflammatory proteins such as TNF- α , IL-1, and TGF- β . Neutrophils are the first cells to invade and clean the area by releasing proteolytic enzymes as well as matrix metalloproteinases (MMPs). The influx and activation of tissue-resident macrophages are also important in the wound healing process. They produce

growth factors eg platelet-derived growth factor (PDGF), inflammatory proteins (TNF- α , IL-6), allure fibroblasts and secrete different enzymes, which degrade deteriorated tissue. Little is known about the inflammatory process in vasculitic wounds, but probably MMPs play a role.^{6,7}

Negative pressure wound therapy (NPWT) has shown great advantages in the management of a wide range of wounds,⁸ but reports of its use in inflammatory wounds are scarce.^{9,10} The mode of action of NPWT is based on distinct mechanisms which support and improve the wound healing environment. In traumatic wounds, NPWT increases local vascular endothelial-derived growth factor (VEGF) expression in humans thus promoting angiogenesis and vascular proliferation.^{11,12} In animal models, it has shown to increase the accumulation of granulation tissue.¹³ NPWT also increases blood flow in ulcers and promotes wound contraction.¹⁴ The expression of MMP-2 and MMP-9 are increased in chronic wounds¹⁵ and NPWT has shown to reduce the expression of MMP-9.¹⁶

Previous reports of NPWT treatment in dermatologic conditions include eg pyoderma gangrenosum, hidradenitis

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