



Negative-pressure Wound Therapy in Chronic Inflammatory Breast Diseases

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ABSTRACT

Mastitis is inflammation of breast tissue that may or may not originate from an infection. Two different forms of mastitis have been described, lactational and non-lactational. Lactational mastitis is the most common type and generally conservative therapy that includes milk removal and physical therapy provides symptomatic relief, but antibiotic therapy is also needed. Common types of non-lactational mastitis are periductal mastitis and idiopathic granulomatous mastitis. Treatment includes antibiotics, drainage, and surgery, but usually this is a chronic process and a therapeutic management algorithm for chronic breast inflammation is unclear and has no consensus. Negative-pressure wound therapy is commonly used for various types of wounds but is limited for breast wounds. In this report, we present and discuss two patients with chronic breast inflammation who underwent surgery and were successfully treated using negative-pressure wound therapy to minimize wide tissue defects and cosmetic problems after surgery. Use of negative-pressure wound therapy for breast wounds might be beneficial as it is with other wounds but there is scarce information in the literature

Keywords: Negative-Pressure Wound Therapy, breast, mastitis

Introduction

Mastitis is inflammation of the breast tissue that may or may not originate from an infection. Two different forms of mastitis have been described, lactational and non-lactational. Lactational mastitis is the most common infection of the breast, usually associated with fever, pain, redness, and swelling in a breast-feeding mother. It is generally seen in the first six weeks of the postpartum period. Conservative therapy including milk removal and physical therapy generally provides symptomatic relief but antibiotic therapy is also needed (1, 2).

Mastitis does not always occur during lactation. Common types of non-lactational mastitis are periductal mastitis and idiopathic granulomatous mastitis. Periductal mastitis is the inflammation of subareolar ducts, which is especially seen in young women; smoking increases risk. Periductal mastitis treatment includes antibiotics combined with needle aspiration or incision and abscess drainage but it is usually a chronic process and needs surgical treatment with excision of the diseased duct (3, 4). Idiopathic granulomatous mastitis (IGM) is benign inflammation of breast with unknown etiology. IGM may be associated a mass, pain, abscess, nipple retraction, sinus or fistula formation, and mimics malignancy. Treatment includes antibiotics, drainage, surgery, and steroids (5). The therapeutic management algorithm of chronic breast inflammation is unclear and has no consensus.

The use of negative-pressure wound therapy (NPWT) was first reported in traumatology. NPWT systems have become a common treatment choice for acute, sub-acute, and chronic wounds (6).

Use of NPWT in breast wounds is not common and there are insufficient publications in the literature to support its use. In this report, we present and discuss two patients with chronic breast inflammation due to idiopathic granulomatous mastitis and periductal mastitis who underwent surgery and were successfully treated with NPWT to minimize wide tissue defects and cosmetic problems after surgery.

Case Presentations

Case 1

A woman aged 31 years was admitted to our department with symptoms of right breast pain, swelling and redness. Her past medical history did not include any diseases. The patient's physical examination revealed erythema, hyperemia and a fluctuating mass in the right upper

quadrant of the breast. Ultrasonography (USG) showed heterogeneous echogenic tissue planes dissected with linear fluid collections. Magnetic Resonance Imaging (MRI) also showed significant contrast enhancement but no masses. Abscess drainage were performed and a bacterial smear was taken. Amoxicillin-clavulanic acid antibiotic therapy was administered to the patient. She failed to improve and one week later necrotic breast tissue was debrided and the tissue was sampled. Cultures and special stains for bacteria, mycobacteria, and fungi were negative. The histopathologic examination demonstrated granulomatous mastitis. No caseification necrosis or vasculitis signs were present. The patient's weight was 60 kg and we administered low-dosage steroid (0.5 mg/kg/day oral prednisolone) at a total of 30 mg/day.

During clinical follow-up period, significant healing was not observed; therefore, wide surgical debridement was undertaken. The tissue defect closed using NPWT with 3-day intervals. After two weeks, the wound sutured primarily after formation of sufficient granulation tissue. The patient demonstrated no recurrence at 1 year follow-up. The patient gave her informed consent to inclusion in this study.

Case 2

A woman aged 25 years was admitted to our department with signs of left breast abscess. Her past medical history included smoking. Abscess drainage was performed and abscess and wound cultures were taken. Amoxicillin-clavulanic acid was administered to the patient according to the culture results. USG and MRI findings were consistent with chronic inflammation and ductal dilatation. After two weeks of follow-up, the clinical findings did not ameliorate. The patient underwent surgery and wide excisions of the diseased ducts were performed (Figure 1). The wound was closed using NPWT with 3-day intervals (Figure 2). The wound finally closed after two weeks. No recurrence was observed in six months of follow-up. The patient gave her informed consent to inclusion in this study.

Discussion and Conclusion

Chronic breast inflammation usually needs to be treated with surgical excision but it is restricted to present large tissue defects and esthetic problems. NPWT is widely used nowadays to treat acute, sub-acute, and chronically infected wounds. The negative pressure generated by the closed system results in removal of infectious debris and exudates, reduction of edema, increases blood flow, which provides for new granulation tissue development and wound protection (7).

Negative-pressure wound therapy is mostly used for morbidities of wounds after breast surgery such as mastectomy, breast reconstruction, mammoplasty, quadrantectomy for breast cancer, breast reduction, TRAM flap necrosis, and tissue expander infection. NPWT, with or without surgical procedures or antibiotics, may have benefits in the treatment of complicated breast incisions and injuries. No complications with the use of NPWT have been reported (8).

Usage of NPWT in mastitis-associated chronic breast wounds are limited in the literature. Richard and colleagues used NPWT combined with surgery and antibiotic therapy to treat a patient with recurrent breast abscess with unknown etiology. The patient successfully healed within 7 weeks (9). Also, Luedders and friends used a combination of NPWT with surgery and antibiotic therapy in the treatment of mastitis-associated chronic breast inflammation of 5 patients. All patients healed successfully and no infection recurrence was reported (10). The main reason for selection of vacuum-assisted closure (VAC) therapy for our two patients was the need for surgical



Figure 1. Skin and tissue defect following surgery



Figure 2. Application of negative pressure wound therapy

debridement due to a persistent inflammatory process in their breast wounds. The tissue defects closed using NPWT with 3-day intervals. After two weeks, the decision was made to suture the wound based on the observation of a sufficient grade of granulation tissue, with no purulent or serous discharge from wound.

In this two patients we used NPWT after surgery for chronic inflammation of the breast. Use of NPWT shortened the healing period with good cosmesis in both patients. No adverse effects of NPWT were seen.

Use of NPWT for breast wounds might be beneficial as it is for other wounds. However, there is scarce information in the literature. Large prospective controlled studies that compare standard treatment with the use of NPWT are needed to evaluate the main role of NPWT.

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