Case report

Two-stage Treatment Using Negative Pressure Wound Therapy with Instillation and Dwell Time (NPWTi-d) for Extensive Hidradenitis Suppurativa of the Buttocks

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ABSTRACT

Introduction: Hidradenitis suppurativa is extremely difficult to treat. In the setting of a widespread infection, skin flaps and skin grafting are used to cover the wound after total excision of the infected region. If the treatment of the excised wound is inadequate and it is still infected, if the skin graft did not take, or if the bottom of the flap could not adhere, a recurrence of the infection might occur. We report the case of a patient with extensive hidradenitis suppurativa of the buttocks who was successfully treated with quick and efficient wound bed preparation using negative pressure wound therapy with instillation and dwell time (NPWTi-d).

Case: A 46-year-old man with a subcutaneous abscess on the buttocks presented to our department 3 years ago for the surgical treatment of extensive hidradenitis suppurativa.

Result: The patient underwent a wound resection under the superficial fascia, which included fistulas and inflammation. NPWTi-d was started the day after surgery. Wound granulation occurred very quickly using a graft bed, and 2 weeks later mesh split skin grafting was performed, without signs of infection.

Discussion: Extensive hidradenitis suppurativa infections require a wait time between the removal of the infection and the occurrence of granulation, making it difficult to predict when the second operation can be performed. In this case, NPWTi-d, which allowed for simultaneous wound irrigation and graft transplantation, was considered useful for the second-stage treatment of hidradenitis suppurativa.

Key words: chronic pyoderma, hidradenitis suppurativa, NPWTi-d, skin grafting, wound bed preparation

Introduction

Hidradenitis suppurativa is a type of chronic pyoderma, which is due to bacterial infections in multiple occlusive follicular lesions. Chronic hidradenitis suppurativa can result in a prolonged inflammatory response as well as granulomatous changes. The most common sites for these lesions are the axilla, buttocks, head, and neck. Long-term inflammation can in turn become an origin of squamous cell carcinoma. Hidradenitis suppurativa of the buttocks is common among middle-aged men, even more so among smokers. Acne-like pustules gradually merge not only in the buttocks but also in the lower back, vulva, and thighs, eventually forming a large infiltrative lesion.

Hidradenitis suppurativa is listed as one of the most difficult diseases to treat. Non-invasive treatment includes long-term oral antibiotics such as tetracyclines, and surgical treatments include incision and drainage, resection, skin grafting, and skin flap creation. If surgical treatment of the infection is inadequate, the skin graft may not adhere, or the infection may recur and spread from the bottom of the flap. We are reporting a case in which an extensive hidradenitis suppurativa on the buttocks was treated with negative pressure wound therapy with instillation and dwell time (NPWTi-d) with good results.
A 46-year-old man with no previous history presented with a subcutaneous abscess in the buttocks 3 years ago. Two months prior, incision drainage and antibiotics had been repeated at a local dermatologist. Long-term erythromycin use caused drug-induced interstitial pneumonia, which was cured by steroid administration. The patient was referred to a dermatologist in our hospital for the radical treatment of his hidradenitis suppurativa. Subcutaneous abscesses were found over a wide area on both sides of his buttocks. There was yellowish-white to yellowish-red drainage with a foul odor from many fistulas (Fig. 1). The patient presented to our department for the surgical treatment of his extensive hidradenitis suppurativa.

Upon admission to the hospital, the patient began a low-residue diet in conjunction with laxative use, and an enema was performed the day before surgery. During surgery, the skin incision line was marked along the inflamed area indicated by discolored skin. Debridement was performed under the superficial fascia, and included the fistulas that were stained by crystal violet (Table 1 and Fig. 2).

We checked that the wound was hemostatic the day after surgery, after which NPWTi-d was started using V.A.C. Veraflo treatment (KCI Licensing, Inc., Japan) (Fig. 3a).

The following protocol was used: the negative pressure was 125 mmHg, the injection size was 100 ml, the immersion time was 10 minutes, the injection was repeated every 3.5 hours, and the foam was changed once every 2 to 3 days. In addition, some ingenuity was required when using the NPWT foam. A hydrocolloid dressing (Duoactive ET, ConvaTec Inc., Japan) was used around the anus, and a hole was created by making a longitudinal incision through the center of the dressing (Fig. 3b). A film was then placed over the foam and dressing, after which negative pressure was applied. When the patient needed to defecate, the film was incised, and then film was added on top of the incision once the patient was done.

Granulation occurred very quickly and provided a good bed for transplantation. Two weeks after granulation, mesh layer grafting was performed from the thigh and back.

Grafts sized 10 × 12 cm from the back of the right thigh, 10 × 22 mm from the back of the left thigh, and 10 × 12 cm from the back were cut at 15/1000 inches and transplanted to a triple mesh (Fig. 4).

The wound was assessed on the 4th day after the transplant, after which treatment was performed once every 3-4 days. The adherence of the skin graft was good, and there was no sign of infection (Fig. 5).

Hidradenitis suppurativa is a disease accompanied by mental anguish due to its frequent occurrence in the axilla, vulva, and buttocks, which often causes severe discomfort. Mental care is therefore very important, and there are reports that surgical resection at an early stage should be considered in cases where remission is unlikely because of the high recurrence rate of the disease. The Harley classification system is often used to help determine treatment for hidradenitis suppurativa, and this case corresponds to stage III (Table 2). Treatment with incision and drainage has been reported to have 100% recurrence within 3 months. In addition, it was reported that the recurrence rate in stage III is about 15% for primary closure, 8% for flaps, and 6% for skin grafts.

There have been 4 reports of hidradenitis suppurativa being treated with NPWT in Japan and 20 reports overseas (excluding pyoderma gangrenosum). Of these, there was one paper reporting the use of NPWTi-d in four cases. In these cases, skin grafts were able to be performed after 3-6 days using NPWTi-d. Since normal NPWT cannot be used for infected wounds it is essential to confirm that there is no infection or drainage after daily washing and it has been reported that about 1 week was required to ensure the absence of infection. NPWTi-d can be used in infected wounds, and about 1 week is considered sufficient for granulation growth. Since in this case the affected area extends to the sciatic region, it was necessary to increase the number of granulations, for which 2 weeks was allowed. Since the infected area included both anal sphincter muscles, it was necessary to minimize defecation with a low-residue diet and the internal use and attachment of NPTWi-d. Extensive hidradenitis suppurativa requires a wait time between the removal of infection and granulation, and it is therefore difficult to predict when the skin grafting can be performed. Based on previous reports it was thought that the skin grafting could be performed earlier in our case by using NPWTi-d. Therefore, NPWTi-d, which can be used to remove
infection and prepare the wound bed at the same time, was considered useful for the second-stage treatment of hidradenitis suppurativa.

The advantages of NPWTi-d compared to conventional NPWT are as follows: 1) Infection control: it can be used for infected wounds, meaning we can control the infection at an early stage even if the infection remains after the debridement of the hidradenitis suppurativa lesions; 2) Schedule: the second-stage surgery is possible 1 week later, and it is easier to schedule the second surgery. 3) Economical: it shortens the length of administration, daily washing is not required, and labor costs can be reduced.

The disadvantages of NPWTi-d are as follows. 1) Procedure: it is necessary to fix the film firmly for washing, which can be complicated; 2) Patient burden: it is inconvenient when moving because physiological saline for washing is attached. However,
beyond these shortcomings, the number of treatment days is reduced.

**Conclusion**

Extensive hidradenitis suppurativa is recurrent and difficult to treat. This is because it is necessary to wait for the infection to clear and granulation to occur prior to proceeding with the skin grafting. It is therefore difficult to predict when the second operation can be performed. NPWTi-d allows for simultaneous washing and transplantation and is considered safe to be used for the treatment of extensive hidradenitis suppurativa.

**Conflicts of interest**

None.
Fig. 4. The second surgery.
(a): Granulation 2 weeks after NPWTi-d operation.
(b): Immediately after mesh splitting.

Fig. 5. Postoperative course.
(a): 2 weeks after surgery.
(b): 4 weeks after surgery.
(c): 6 months after surgery.
(d): 11 months after surgery.
References

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| Stage | Treatment Recommendations |
|-------|---------------------------|
| Hurley stage I | Multi-disciplinary team evaluation: Medicine/rheumatology, wound care (if necessary), plastic surgery/colorectal surgery (if appropriate) Weight loss, smoking cessation, meticulous hygiene, diabetes control, and/or topical antibiotics |
| Hurley stage II | Stage I measures plus: local and systemic therapies (including immunotherapies) and minor surgical procedures |
| Hurley stage III and/or recurrent stage I ± II | Stage I and II measures plus: extensive surgical resection, skin graft, and/or wound care with concurrent systemic therapy |