



Case report

Photodynamic therapy combined with surgery for hidradenitis suppurativa: A case report

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ABSTRACT

Hidradenitis Suppurativa (HS) is a distressing painful chronic inflammatory skin follicular condition. It is a challenge to achieve better therapeutic effect and lower recurrence rate. In this report, ALA-PDT combined with surgery for the treatment achieved ulcer healing, pain elimination, with no relapse during our follow-up.

1. Introduction

Hidradenitis Suppurativa (HS) is a distressing painful chronic inflammatory skin follicular condition, presenting multiple rounded nodules or boils. It can develop into abscesses, ulcers, sinus tracts, and keloids. It is basically distributed around the apocrine gland-distributing areas, such as axillary, inguinal, and anogenital regions [1]. Simple surgical therapy could cause extensive and deep operation trauma with a high postoperative recurrence rate [2]. Thus, we adopted 5-aminolevulinic acid photodynamic therapy (ALA-PDT) combined with surgery to treat severe HS in this case. We found this combination therapy was effective and shortened the healing time of no relapse during 6 months' follow-up.

2. Case report

A 36-year-old married woman came to our hospital for "painful nodule, ulceration, and suppuration in the right armpit for 1 month". One month before admission, the patient stumbled upon a peanut-sized painful nodule in her right armpit. With the systemic treatment of antibiotics and external application, redness and nodule became bigger and developed into 3 walnut-sized abscesses. On physical examination, multiple walnut-sized nodules with redness, sinus tracts, a mixture of pus and blood, high skin temperature, and haphalgesia were distributed in the right armpit (Fig. 1a). Slightly thickened folds of skin were touched in the left armpit without noticeable nodule or abscess. After cleaning the local skin surface, a pus sample was collected, tested by bacterial culture, and identified as *Bacillus cereus* infection. According to the Hurley classification [1], the severity is assessed as grade III HS. The patient was given multiple-sites surgical incision, drainage,

removal of necrotic tissues, and repeated rinses (Fig. 1b). ALA-PDT was adopted 2 days later after informed consent. The multiple abscess cavities and ulcers were incubated with 20% ALA for 2 h. Then the lesions were irradiated with semiconductor laser optical fiber (LD600C, 635 nm, Wuhan Yage Optic and Electronic Technique, China; Fig. 1h) and LED red irradiation respectively (LED-IB, 633 nm, Wuhan Yage Optic and Electronic Technique, China). PDT was operated on the power density of 71 mw/cm², energy density of 85 J/cm², distance of 20 cm, and 20 min irradiation time for each light spot. ALA-PDT treatment was administered every 10–15 days for three times. Results: 1.5 months after admission, the patient felt well with ulcer healing and pain elimination (Fig. 1c-f). In 6 months of outpatient follow-up, the skin lesion was observed without relapse (Fig. 1g).

3. Discussion

HS is a distressing painful chronic inflammatory skin follicular condition presenting multiple nodules, boils, abscesses, ulcers, and sinus tracts. In clinic, a comprehensive category including pharmacological therapy, surgical therapy, and other interventions is recommended. However, it is still a challenge to achieve better therapeutic effect and lower recurrence rate. The exact pathogenesis may still be uncertain. While we could infer that deep-seated inflammation around follicles or glands, and bacterial loads are important factors leading to recurrence. Therefore, it's urgent to find a more effective method to treat HS. PDT has been commonly shown effective against skin appendage disorders, through a high concentration of singlet oxygen produced from photodynamic substances. For acne, PDT can direct destruct sebaceous glands, reduce follicular obstruction and hyperkeratosis, and decrease inflammatory cells [3]. PDT also shows

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Fig. 1. (a) right armpit before treatment; (b) right armpit after surgical incisions; (c) right armpit after 1 PDT treatment; (d) right armpit after 2 PDT treatments; (e) right armpit after 3 PDT treatments; (f) 1 weeks after 3 PDT treatments; (g) 6 months after 3 PDT treatments; (h) during PDT treatment.

potent antibacterial effects by directly killing bacteria and destroyed biofilms [4]. In this case, the severity is assessed as grade III HS, with *Bacillus cereus* infection. *Bacillus cereus* is most known to cause food intoxication. It is rarely reported to cause deep soft tissue infection, skin and soft tissue necrosis, or gas gangrene. It is naturally resistant to penicillin, ampicillin, cephalosporin, and other beta-lactam antibiotics, and has also been reported resistant to carbapenems and clindamycin, so conventional antibiotic therapy probably fails to be effective. Thus, we applied ALA-PDT combined with surgery for the treatment, achieving shorter healing time and no relapse during 6 months' follow-up, consistent with other investigator's results [2]. Previous studies have shown that bacteria are probably not the initial causative factor of HS, but, likely play a central role in the immune system during the chronic relapsing stages [5]. Biofilms featured by strengthening bacterial resistance to antibiotics and immune clearance has also been reported in HS [6]. PDT, combined with surgery may directly destroy hair follicles and sebaceous glands, and reduce the bacteria load onto affected areas, helping to shorten the healing time with a lower recurrence rate. More data should be accumulated to verify the role of combination therapy in controlling and preventing HS recurrence.

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Declaration of Competing Interest

No conflict of interest exists in the submission of this manuscript.

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