



Case report

5-ALA PDT successfully treats facial hidradenitis suppurativa-induced severe hypertrophic scar

Zhe-wen Zhou, Xiao-dong Chen, Xiao-yan Wu*

Department of dermatology and venereology, Nantong University Affiliated Hospital, No. 20 Xisi Road, Nantong 226001, Jiangsu, China¹

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ABSTRACT

Hidradenitis suppurativa (HS) is a type of chronic suppurative inflammatory reaction of the hair follicles characterized by recurrent dermal abscesses, sinus tracts and scars. In this report, one case of severe hypertrophic scar induced by facial HS achieved resolution of skin lesions after combined treatment with high concentration single-dose 5-aminolevulinic acid photodynamic therapy (5-ALA PDT). No recurrence was observed up to eleven months of follow-up. The 5-ALA PDT based treatment could improve the severe hypertrophic scar induced by HS in an effective and safe manner.

1. Introduction

Hidradenitis suppurativa (HS), also known as acne inversa, is a chronic inflammatory skin disorder characterized by recurrent dermal abscesses, sinus tracts and scars [1]. It seems to be an essential event that follicular hyperkeratosis in the pilo-sebaceous unit leads to blockage and rupture of the follicle with subsequent inflammation and secondary infection [2]. Repeated episodes of inflammation in HS can lead to scars, as the result of chronic inflammation in the reticular dermis. Medical management for HS, including tretinoin, antibiotics and glucocorticoid. Surgery, including simple resection, drainage, wide excision and even skin transplant may be ineffective in controlling the disease [3]. In the clinic, most of HS can lead to atrophic scars with skin contractures. In this report, the case of giant hypertrophic scar induced by facial HS has achieved resolution of skin lesions after combined treatment with high concentration single-dose 5-aminolevulinic acid photodynamic therapy (5-ALA PDT).

2. Case report

The patient was a 30-year-old man who was presented to our department with acne-like lesions all over face with painful deep boils (yielding foul smelling and pus discharge) on the scalp for more than ten years. The facial lesions resulted in pustules and casual external drainage, leaving scars with hypertrophic ropelike bridged scars after healing. He was administered isotretinoin for more than half a year and received 5% 5-ALA PDT once in another hospital. He also received

intralesional steroid injections to prevent the scar from being prominent but it showed no notable alleviation either. The patient had no other complicating disease or family history of keloid. Physical examination revealed multiple tender, fluctuant cystic nodules and papules of positive tenderness with obvious interconnecting sinus tracts covering the entire scalp, especially at the occipital and vertex regions. There were multiple nodules and cysts on his face and the jaws were occupied by thick scars (Fig. 1a-d). No similar lesions were found in other parts of the body. Characterized by acne conglobata and dissecting cellulitis of the scalp, he was diagnosed with HS. We considered the severe scar as hypertrophic scar induced by facial HS.

The blood and imaging examination showed no abnormalities after hospital admission. Afraid of the risk of scar hyperplasia in donor site, the patient refused skin flap or grafting. We decided to treat with surgical scar peel-off and photodynamic therapy under local infiltration anesthesia with ropivacaine that lasts longer. Firstly, scars were peeled off layer by layer and there revealed several infections and sinuses inside (Fig. 1e-f). Immediately after removal of scars, the patient was sent to receive 5-ALA PDT. We used fresh ALA solution (Shanghai Fudan-Zhang jiang Bio-Pharmaceutical Co. Ltd., Shanghai, China) and applied it to the whole surgical area especially the infected lesions and sinuses. Covered with a black sheet for three hours, the area was exposed to a LED light source with peak wavelength at 633 ± 6 nm in the red light spectrum at dose levels of 60 J/cm^2 for 20 min (Fig. 1g). To better protect the wound, we used oil gauze and changed dressings frequently. The patient also received systemic antibiotics after the surgery (Fig. 1h-j). During eleven months of follow-up, the patient did not take any

* Corresponding author.

E-mail addresses: zhouzhewen0715@163.com (Z.-w. Zhou), dermatochen@163.com (X.-d. Chen), wuxiaoyannt@126.com (X.-y. Wu).¹ Present address/Permanent address.



Fig. 1. (a,d) Facial lesions at different angles before treatment; (e) Patient in surgical scar peel-off; (f) Infections and pilonidal sinuses inside the scar; (g) Patient in high concentration single-dose 5-ALA PDT; (h,j) Immediate postoperative facial lesions at different angles; (k,m) Eleven-month follow-up. This is the first report about severe hypertrophic scar induced by facial hidradenitis suppurati

other treatment and his appearance was significantly improved (Fig. 1k-m).

3. Discussion

Patients with HS not only suffer from the long-term chronic disease, but also are more likely to have psychological problems due to its complications [4]. Though the treatment, including antiandrogens, topical and systemic antibiotics, retinoids, immunosuppressive drugs, surgical resection, laser and phototherapy is relatively effective, the recurrence rate is still very high. In clinical practice, photodynamic therapy has become a common treatment in dermatology for a variety of inflammatory diseases. The most common used 5-ALA PDT is based on the use of a combination of a photosensitizing agent, light energy and oxygen to generate a chemical reaction that produce PpIX, that results in selective killing of targeted cells due to its effect on direct destruction of sebaceous glands by reactive oxygen species, reduction of follicular obstruction and hyperkeratosis to prevent scar hyperplasia [5,6]. The advantages of photodynamic therapy include the capacity for

non-invasive targeted therapy via topical application of the drug and promotion healing of incision by using red light, as well as the ability to generate better cosmetic results with minimal discomfort. Liu and Zhang provided the successful treatment for recalcitrant dissecting cellulitis of the scalp and HS with 5-ALA PDT [7,8]. Some reports also indicated that 5-ALA PDT effectively restrained pathological hyperplasia of fibroblasts from hyperplastic scar tissues [9].

In fact, the penetration of scar tissue is much lower than the normal skin. In that case, it's not easy for the photosensitizing agent to get through the dense scar tissue. The experience of this case suggests that the treatment should target to infections. Most infections have been removed during scar peel-off and the hidden infections were showed. At that time, 5-ALA PDT can be applied to improve deep infected lesions and reduce scar formation. In case that the wound exudate can affect the administration of 5-ALA, the wound should be subjected to electrocoagulation for hemostasis strictly. Once the wound healed, the poor penetration of 5-ALA with topical application is limited and restrains the production of PpIX which could restrict PDT outcomes. As a result, we gave preference to high concentration 20% 5-ALA PDT for single

dose. There was no need to do skin transplant because facial re-epithelialization was better than other parts of the body, with the red light in PDT accelerating wound healing. As a matter of fact, our case verified that 5-ALA PDT based treatment successfully treated facial HS induced severe hypertrophic scar and promoting the wound healing.

4. Conclusions

The eleven months follow-up demonstrated that the surgical scar peel-off and high concentration single-dose 5-ALA PDT may be a curative modality for patients with repeated episodes of inflammation in HS. The combined treatment could improve the severe hypertrophic scar induced by HS in an effective and safe manner.

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