

C A S E R E P O R T

A challenge in treating severe nodulocystic acne with keloid

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Abstract. *Introduction:* Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit that affects mainly adolescents. Acne can develop into refractory cysts, nodules and subcutaneous fistulas that are resistant to therapy. Keloid is a benign fibroproliferative tumor that occurs as a response to any kind of injury to the skin of susceptible individuals. Severe acne lesion become complicated with keloidal scars. Systemic treatment is indicated for the management of severe acne. However, we must be selective in choosing the right therapy for each condition. *Case illustration:* An 18 year old man presented with severe nodulocystic acne and multiple keloidal scars affecting his face, neck, upper chest and back. The patient was treated with oral minocycline (50 mg twice daily for 1 month and continued with 50 mg once daily for 2 months) along with topical salicylic acid (SA) and zinc (two times a day) as well as moisturizer containing 5% panthenol (two times a day). After 3 months of therapy, the patient showed a satisfying result and no adverse effects. *Discussion:* Minocycline has both antibacterial and anti-inflammatory properties. SA breaks down follicular keratotic plugs and promotes desquamation of the follicular epithelium, and has an anti-inflammatory effect. Moisturizer containing panthenol and zinc is helpful in the management of dryness caused by topical SA and its antibacterial properties help fight acne and regulate sebum production. *Conclusion:* These combination therapies are effective, safe, and may serve as an alternative treatment for severe nodulocystic acne with keloid formation.

Key words: keloid, minocycline, panthenol and zinc, salicylic acid, severe nodulocystic acne

Introduction

Acne is a chronic inflammatory disorder of the pilosebaceous unit. Its incidence peaks between the ages of 12 and 24 years, affecting approximately 85% of individuals in this age group. Acne most commonly appears on the face, neck, chest, and upper back, where sebaceous follicles are most concentrated. The pathogenesis of acne is multifactorial, involving four interrelated mechanisms: increased sebum production, hyperkeratinization of the follicular infundibulum, inflammation, and colonization by *Cutibacterium acnes*. In more severe cases, acne can progress into refractory cysts, nodules, and subcutaneous fistulas, which may be resistant to conventional therapies^{1,2,3}.

The most important complication in acne is scar formation as it may have a significant psychological and social impact on individuals. Keloids are benign fibroproliferative tumours that occur as a response to any kind of injury to the skin of susceptible individuals. In nodulocystic acne, hypertrophic scars and keloids are frequently observed. Scar formation is associated with the duration and depth of inflammation. If inflammation involves the reticular dermis, hypertrophic scars and keloids may develop³.

Case Illustration

An 18-year-old man presented to the dermatology clinic with a chief complaint of painful, fluid- and

pus-filled lumps on his face, upper chest, and back. The condition had significantly worsened over the past 6 weeks prior to presentation. He reported a 2-year history of frequent comedones, erythematous rashes, and pimples, which often dried, hardened, and evolved into keloid scars. There was no history of prior treatment for his condition.

A physical examination revealed comedones (105) papules (54), pustules (56) tender draining nodules (20) cysts (5) that were distributed primarily over his face, upper chest, neck, left and right posterior shoulders, and back. There were multiple acne scars in the face and multiple hypertrophic scars along with keloids distributed over his chest, posterior shoulders and back (Figure 1).

The patient was diagnosed with severe nodulocystic acne. Initial treatment included doxycycline 100 mg orally once daily, a topical combination of

0.1% adapalene and 2.5% benzoyl peroxide cream (applied once daily at night), and 4% nicotinamide gel (applied once daily in the morning). Within three weeks, the patient reported worsening lesions on the nose, cheeks, shoulders, and back. Due to this exacerbation, the initial regimen was discontinued. A new treatment plan was initiated, consisting of minocycline 50 mg orally twice daily, a topical combination of salicylic acid and zinc ointment (applied twice daily), and a moisturizer containing 5% panthenol (applied twice daily). After four weeks, the patient showed a significant reduction in both the number and size of inflammatory lesions. Given the marked improvement, the minocycline dose was reduced to 50 mg once daily for an additional 8 weeks to minimize the risk of antibiotic resistance. The topical regimen was continued. After three months of therapy, the patient demonstrated an excellent clinical response (Figure 2).



Figure 1. Patient's clinical condition before treatment



Figure 2. Patient's clinical condition after 3 months of treatment with significant improvement of facial lesions

Discussion

Systemic therapies are recommended for moderate-to-severe acne. Systemic treatments include oral antibiotics and oral isotretinoin. In many literature pieces isotretinoin is approved as treatment for severe nodulocystic acne especially in males¹. However, systemic isotretinoin has several side effects such as teratogenicity, adverse psychiatric episodes and delayed wound healing that may lead to hypertrophic scarring and keloid formation. There are documented cases of developed idiopathic keloid scarring after taking isotretinoin^{4,5}. Antibiotics, particularly of the tetracycline family, are considered first-line treatments for moderate-to-severe acne. Doxycycline and minocycline are the most common oral tetracycline antibiotics prescribed for acne. Tetracyclines downregulate Cutibacterium acnes lipases, thereby preventing the release of follicular fatty acids. This action suppresses neutrophil chemotaxis to the follicular site, inhibits phospholipase A2-dependent activation of inflammatory pathways, reduces matrix metalloproteinase activity, and decreases nitric oxide production.

Minocycline also downregulates the production of proinflammatory cytokines. Due to its anti-inflammatory and antioxidant properties, minocycline has been shown to be more effective against *C. acnes* in vivo when compared to tetracycline and doxycycline. This enhanced efficacy may be attributed to minocycline's high lipophilicity, which allows it to achieve higher concentrations in sebaceous follicles⁶.

A multimodal approach with a combination of products is recommended in treating acne. Salicylic acid possesses anti-inflammatory properties and facilitates acne treatment by breaking down follicular keratotic plugs and promoting desquamation of the follicular epithelium⁷. In a randomized clinical trial, salicylic acid was found to be as effective as a combination of 5% benzoyl peroxide and 0.1% adapalene in the treatment of acne⁸. Zinc, an essential trace element, contributes to skin health by regulating keratinocyte proliferation and exerting antibacterial effects. Several studies have reported that patients treated with zinc showed a significant reduction in the mean number of inflammatory papules compared to those who

did not receive zinc therapy⁹. A moisturizer containing panthenol enhances the skin barrier by reducing transepidermal water loss (TEWL) and maintaining skin softness. It also exhibits anti-inflammatory properties¹⁰.

Conclusion

There have always been challenges in managing nodulocystic acne with keloids. We must choose the right therapy considering the patient's condition. These combination therapies are effective, safe and can be an alternative for severe nodulocystic acne with keloids.

Declaration of Interest Statement: The authors declare no conflict of interest in this article.

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