



Two Cases of Treatment of Moderate to Severe Acne with an Acupuncture-Debridement Microsurgical Technique and Review of the Literature

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Abstract: Acne is a chronic inflammatory disease of pilosebaceous glands. Microsurgical acupuncture and debridement technique is one of the most precise and effective external treatment for acne. We introduce successful treatment of two cases of moderate to severe acne with this technique and describe the characteristics and mechanism of the technique in detail. We innovatively put forward a series of technical schemes including minimally invasive debridement, key points in operation and combined medication in the microsurgical therapeutic technique of acupuncture and debridement. It provides a practical reference for the simple and effective therapeutic technique to be applied to the clinical treatment of acne.

Keywords: acne, acupuncture, debridement

Acne is a pilosebaceous chronic inflammatory disease, characterized by comedones, papules, pustules, nodules, cysts and scars.¹ Microorganisms and inflammatory reactions play important roles in the pathogenesis of acne. It often occurs on the face of teenagers, showing serious impact on their physical and mental health, especially severe acne with nodules, erythema, atrophic and hypertrophic scars that greatly affect the appearance.² There are various topical and oral treatment options for patients with acne.³ Microsurgical therapeutic technique of acupuncture and debridement is one of the most direct and effective treatment for acne. It is a minimally invasive operation to relieve the symptoms by eliminating sebum, purulent secretions, congestion and necrotic tissue through the hair follicle. Up to now, it has been frequently used in medical cosmetic organizations but not been widely valued and adopted in most hospitals probably due to the lack of standardized and detailed operational process.

In order to standardize and generalize this immediate and effective treatment, we improved the traditional therapeutic technique of acupuncture and debridement by innovatively proposing a series of technical concepts including minimally invasive debridement, operational methods and scheme of combined medication, which have received good effects in clinical practice. Here, we introduce two cases of moderate and severe acne treated with the acupuncture-debridement microsurgical technique and summarize the characteristics, mechanism and standardized operation of acupuncture and debridement according to relevant literature. All study participants provided informed written consent to participate in the study and to have their cases published, prior to study enrolment. In both cases, a parent or legal guardian has also provided written informed consent to publish the case details and images.

Case

Case I

A 16-year-old male complained of continuous aggravation of facial acne and came to clinic on September 11th, 2021. He had developed inflammatory papules of the whole face, starting from both cheeks since May, 2020. He had been treated with traditional Chinese medicine, fusidic acid cream and adapalene for more than 2 months without obvious effect. He was diagnosed as moderate acne, with Pillsbury's classification of grade III. There were multiple inflamed pustules with infection on both

cheeks, comedones and papules on the forehead and pigmentation on the face. The patient signed informed consent for innovative acupuncture-debridement microsurgical treatment.

He was treated with the innovative acupuncture-debridement microsurgical technique and postoperative repaired system twice with an interval of 14 days and was observed for 28 days after treatment. Photographs were taken before treatment (Figure 1). On the first follow-up 14 days after the first treatment, we could see that most pustules on the face had completely subsided with only small areas of pigmentation remained. Most comedones and papules on the forehead had completely relieved without pigmentation. The needling area recovered well without dilated pores or scar. Only 3–5 comedones and 1–2 papules recurred during the recovery period.

Then he received the second treatment and the follow-up 14 days later showed only local punctate pigmentation. The follicles healed completely (Figure 2). The patient was highly satisfied. Subsequent follow-ups showed continuous recovery without residual pigmentation, atrophic scar and recurrence.

Case 2

A 16-year-old female complained of a sudden outbreak of acne on both cheeks and forehead for one year. She had been treated with traditional Chinese medicine, topical fusidic acid cream and oral isotretinoin for half a year with limited effect. The lesions recurred rapidly after withdrawal of isotretinoin. According to the Pillsbury's classification, she was diagnosed as severe acne of grade IV. At the first visit, photographs were taken (Figure 3), showing multiple inflamed pustules and nodules on both cheeks, severe pigmentation and multiple comedones on the forehead. The patient signed the informed consent for the innovative acupuncture-debridement microsurgical treatment.

She received the same treatment as case 1. Fourteen days after the first treatment, most pustules and nodules on both cheeks had relieved significantly and most comedones on the forehead had disappeared with only small areas of pigmentation remained. The needling area recovered well without pore expansion or scars.

Then, she received the second treatment. On the follow-up visit 3 months later, as we can see in Figure 4, most of the skin lesions had completely improved with only minor local pigmentation. The follicles healed without dilated pores. On the follow-up visit one month thereafter, her facial pigmentation further faded with only trivial atrophic scar remained. No recurrence was observed during the 6-months-follow-up.

Discussion

The Mechanism of Acupuncture and Debridement

Relieve the Symptoms of Acne Directly and Effectively

Acupuncture and debridement can not only remove the fat plugs, purulent secretions and congestion timely but also greatly alleviate the symptoms of redness, swelling, heat, pain and itching.⁴

Block the Development Process of Inflammation in Acne

After the therapy of acupuncture and debridement, *Propionibacterium acnes* and other microorganisms with related inflammatory factors are largely removed. At the same time, the anoxic environment of follicles is improved, the survival



Figure 1 Left and right facial lesions of case 1 before treatment.

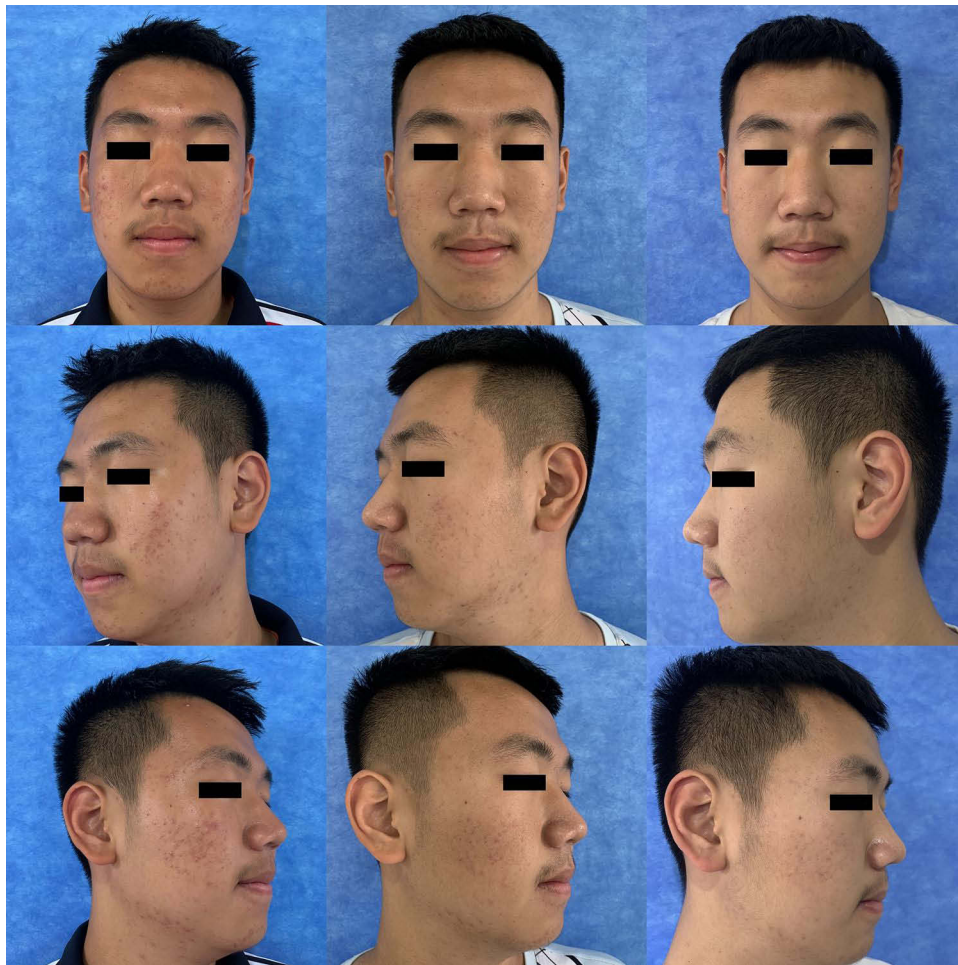


Figure 2 Comparison of different parts of the face in case 1 during treatment. The horizontal photos are the comparison of the same part at different visits (from left to right: September 11th, 2021, September 25th, 2021, and October 6th, 2021); the longitudinal photos are of different parts at the same visit (from top to bottom: the front face, left face and right face).

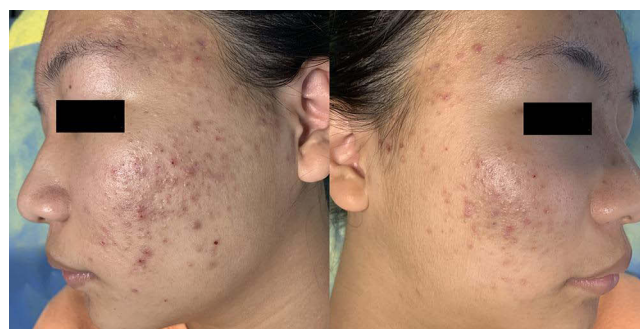


Figure 3 Left and right facial lesions of case 2 before treatment.

environment of the remaining anaerobic microorganisms is destroyed, so the development process of inflammation is largely blocked.⁵ The positive effects of skin metabolism, recovery ability and immunity become dominant, facilitating microcirculation and self-repairment of the lesions. The treatment shortens the course of acne, avoids further aggravation of the lesions, and reduces the incidence of pustules, nodules and cysts.



Figure 4 Comparison of different parts of the face in case 2 during treatment. The horizontal photos are the comparison of the same part at different visits (from left to right: October 6th, 2021, October 23th, 2021, and January 21th, 2022); the longitudinal photos are of different parts at the same visit (from top to bottom: front face, left face and right face).

Acupuncture Leads to the Redistribution of Subcutaneous Mast Cells

Mast cells are considered as mobile targets of acupuncture and moxibustion,⁶ which are widely distributed in the dermis and submucosa of the skin. Mast cells may aggregate and redistribute in response to physical and chemical stimuli, releasing various biological factors.⁷ The face is a special area with accumulation of mast cells. It is unknown whether mast cells participate in the immune response of acne and whether the factors produced by mast cells aggravate the symptoms of skin lesions in acne, such as redness, swelling, heat, pain, itching, etc. During the operation of acupuncture and debridement, the acupuncture of facial acupoints leads to redistribution of mast cells, thus reducing the symptoms of acne and promoting the healing of the damaged skin. The detailed mechanism needs further exploration.

Promote the Absorption of Drugs

Acupuncture and debridement can dredge the sebaceous duct of hair follicles, facilitate penetration of drugs, accelerate microcirculation and promote the absorption of drugs.⁸

Reduce the Formation of Nodules and Scars

Nodules, atrophic and hyperplastic scars are all formed on the basis of pustules. The inflammatory fluid in pustules on different parts of the face is of different subcutaneous depths. Thus, pustules with inflammatory fluid of different depths will develop into different types of skin lesions. For example, the subcutaneous depth of the pustules on the forehead, temporal region and cheeks is shallow. A large amount of inflammatory pus is generated in the pustules, which expands

the follicles and reaches the epidermis, manifesting white purulent protruding appearance on the skin surface.⁹ The long-term existence of inflammatory fluid leads to the peripheral healing of the expanded follicles. After the inflammatory fluid is metabolized and absorbed, atrophic scars would develop. The pustules on the chin and perioral region are deeper and generally do not show white purulent protrusions. The inflammatory fluid in deeper pustules cannot be absorbed completely and is prone to form subcutaneous nodules. In addition, the inflammatory fluid is internally organized to stimulate the growth of granulation tissue and form hypertrophic scars.¹⁰ It is common that the face recovers to flat appearance during the absorption of inflammatory fluid. However, the inflammatory fluid might remain at the root of the follicles as the skin lesions subside, flocculent necrotic granulation tissue might be formed under the skin, leading to purple black atrophic pigmentation.¹¹ Therapy of acupuncture and debridement can timely remove the inflammatory fluid in the early stage, accelerate self-healing of the expanded follicles, promote the regression of inflammatory erythema, and reduce the generation of atrophic scars,¹² nodules, granulation tissues and hypertrophic scars.

Reduce the Recurrence Rate of Acne

Hyperkeratosis of sebaceous ducts in follicles and the inflammatory reaction caused by microorganisms such as *Propionibacterium acnes* are key factors in the pathogenesis of acne. Therapy of acupuncture and debridement can alleviate the effects of these factors and reduce the recurrence rate of acne.

Indication and Contraindication of Acupuncture and Debridement

Indication: comedones, papules, mature pustules and nodules, some mature cysts with purulent exudation, and pigmentation due to acne.

Contraindication: polymerized cysts with severe infection and mutual adhesion.

Precautions: the treatment of acupuncture and debridement should avoid the dangerous triangle area of the face. At the same time, acupuncture and debridement might stimulate the immature acnes which have not developed to organization of purulent secretion, leading to further inflammatory reactions.¹³

Common Types of Acne Debridement

At present, debridement of acne mainly includes fire-needle therapy in medical institutions and acne removal treatment in beauty institutions.

Fire-needle therapy is to place the tip of the fire needle in the outer flame of the alcohol lamp until it turns red and white, then stab it into the skin lesions vertically, and then quickly remove the needle. The fat plug, purulent secretion and bleeding are then simply cleaned up with the needle or cotton swab. In clinical practice, it is mainly used as an auxiliary technique in combination with other physical therapy or facial mask, and the debridement is incomplete.

Acne removal treatment is to use an acne extruder to extrude the contents of acnes. However, the diameters of acne needles and triangular needles used in beauty institutions are often too large. In addition, the procedure of debridement has not been standardized yet. Frequent treatment makes the pores expanded repeatedly and makes the skin around the pores torn, resulting in various scars.

Innovation and Standardized Practice of Acupuncture and Debridement

In order to overcome the disadvantages of the above two therapies, we innovatively put forward a series of treatment principle, operation standard and postoperative repairment schemes of combined medication for minimally invasive acupuncture and debridement.

The innovative technique focuses on minimizing invasiveness. The improved needle with smaller diameter is adopted. The needle is inserted into the main pores to open the passage of hair follicles without damaging their structure. We replace the sheared force of local pressing with the pushing force generated by pressing the muscle, thus reduce damage to the lesion and fulfill complete clearance of the secretions, pus, tissue and congestions in the follicles.

Selection of Needles

Generally, disposable needles of acupuncture with a length of 13 mm (half inch) and a diameter of 0.25–0.4 mm are used. Such needles can go through the pores without expansive damage to the pores and the surrounding skin tissues, thus reduce the pain of acupuncture.

Preoperative Preparation

Acne around the eyebrows, cheeks and mandible are often extremely sensitive to the pain due to acupuncture and debridement. When treating acnes of these special regions, we should pay attention not to crush the lesions during debridement. Additionally, 5% compound lidocaine cream is recommended for local anesthesia.

Timing and Frequency of Treatment

The timing of acupuncture and debridement depends on the maturity of pustules, nodules and cysts. It takes 3–5 days for pustules, nodules and cysts to mature. At the initial stage, redness, swelling, heat and pain are obvious. The skin lesions on the face are firm because there is no pus in them. When being pressed, no fluctuation could be felt. At the same time, there is no pus and white purulent protruding from the skin lesions. The skin lesions are bright red in color. When they mature, the patient feels no longer intense pain. The skin lesions become soft, and a large amount of pus is formed due to internal organization. When being pressed, fluctuation can be felt. At the same time, there are pus and white purulent protruding from the skin lesions, and the skin lesions look dark red. Generally, the mature lesions are recommended for the treatment.

Patients are generally treated once every 2–3 weeks, depending on the recovery of the skin. Patients with severe acne can be treated once every 3–4 weeks.

Position and Depth of Needling Insertion

The needle should be inserted through the main pores for acupuncture and debridement. There is no resistance with correct insertion, and the patient almost feels no pain. Generally, the pores of follicles in the center of the skin lesions are selected for insertion, especially those with white purulent protruding. The needling depth varies according to the type of skin lesions. Generally, the needling depth for comedones, papules and mild pustules is 3–5mm, and the needling depth for severe pustules, cysts and nodules is 5–8mm.

Key Points of the Technique

The first point is the selection of pressing sites. Usually, the facial muscles 2–4cm away from the center of the acne are pressed. Most of secretions, pus and ecchymosis in the sebaceous gland are thoroughly removed through the pore of follicles expanded by the needle. Second, avoid pressing and pinching the skin lesions because they are weak and likely to form scars. After all, it is impossible to remove the purulent secretions in the sebaceous glands completely.

Post-Operative Repairment and Evaluation of the Therapeutic Effect

After treatment, the recombinant bovine basic fibroblast growth factor gel is used. Besides, it is effective to use the traditional Chinese medical facial mask to reduce swelling. The ingredients of the facial mask include 20g safflower, 20g *Salvia miltiorrhiza*, 15g *Centella*, 15g honeysuckle, 15g dandelion, 15g *Forsythia suspensa*, 15g *Atractylodes macrocephala*, 30g cuttlebone and 10g *Sophora flavescens*. These ingredients can quickly repair the damage of follicles, reduce swelling and promote healing.¹⁴

As the most direct and effective surgical debridement, acupuncture and debridement can remove the secretions, pus and congestions in the sebaceous glands of follicles, and alleviate the symptoms of acne effectively and quickly. This technique blocks aggravation of inflammation and promotes the recovery of follicle expansion due to inflammation, thereby reducing the formation of atrophic scars and nodules.¹⁵ The therapy of acupuncture and debridement can reduce the recurrence rate of acne and accelerate the absorption of topical drugs by dredging the duct of follicles. Finally, it aids local selection of acupoint and plays a role in detumescence and analgesia by stimulating the facial acupoints.

Study Limitations and Case Description

When selecting cases to observe the effect of the new technique on acne, we have taken into account the influence of “nature of the disease” and other drugs or methods. In order to exclude the possibility of self-healing of the disease, only patients whose acne had gradually worsened for more than six months before treatment were enrolled. Besides, the patient had not received any other drugs or therapy for more than six months before our treatment, to rule out the effects of other drugs. However, in this study, the effect of the novel technique on acne was shown in only two cases. In order to test its effect more rigorously, randomized controlled trial should be employed in larger case numbers in the future.

Conclusion

The innovative acupuncture-debridement technique and postoperative scheme of repair have achieved good therapeutic effects in patients with moderate to severe acne. In clinical practice, the professional, standardized and innovative technique could significantly shorten the cycle of treatment and reduce recurrence rate. In addition, the skin lesions of patients recovered well, without sunken or hypertrophic scars. The innovative acupuncture-debridement technique might throw light on treatment of acne and worth further studying.

Data Sharing Statement

The authors confirm that the data supporting the findings of this study are available within the article.

Ethics Statement

We have obtained the ethical approval from the Ethics Committee of the First Affiliated Hospital of Dalian Medical University (PJ-KS-KY-2023-492). Written informed consents to participate and to have their cases' information published have been obtained from all the participants in the study. All authors have approved the submission of this manuscript. The results have not been previously published and are not being considered for publication in another journal simultaneously.

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Disclosure

We confirm that there is no interest of conflict in this work.

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