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**Medical and Health Science**

# Use of Dermal Threads in Treatment of Acne Scars

**Ahmed Y.Kadhim, Shymaa M.Rezk and Amany I.Mustafa**

Dermatology, Venereology and Andrology Dept., Faculty of Medicine, Benha University

**E-mail:** dr.ahmed.yaseen93@gmail.com

**Abstract**

**Objectives:** Examining the use of dermal threads for acne scar therapy and assessing their safety and effectiveness. **Background:** Approximately 12–14% of acne instances continue into adulthood, and it affects 95–100% of 16–17-year-old males and 83–85% of 16–17-year-old girls. The psychological anguish and potential social inhibition caused by scarring increases in proportion to the severity of the scarring, making it an already heavy weight to bear. The three primary forms of acne scars may be classified by the net loss or growth of collagen: atrophic, hypertrophic, and keloidal. Treatment options for acne scars differ based on the severity of the scars and the limits of available treatments. The face lift procedure makes use of a variety of thread types chosen for their ability to stimulate collagen production. Longevity and collagen production are two advantages of smooth polydioxanone (PDO) threads over their counterparts. **Data sources:** The function of dermal threads in acne scars up to the year 2024 was determined by exploring and analyzing Medline resources, including PubMed and Medscape. **Study selection:** The inclusion of all research was determined by separate evaluations. Inclusion was contingent upon them meeting the following requirements: Written in English and published in scholarly publications, these articles explore the use of dermal threads as a remedy for acne scars. **Data extraction:** Research was not considered for inclusion if it did not meet certain requirements. The study's quality was evaluated based on a number of factors, such as the following: the availability of acceptable controls, sufficient information, clearly defined evaluation measures, and whether or not ethical permission was obtained. We used a data collecting form to independently extract information relevant to our research results from all qualifying studies. **Conclusion:** In addition to improving the appearance of boxcar and rolling scars, dermal threads were well-tolerated.

**Key Words:** Acne scar, dermal threads

## Introduction

Approximately 12–14% of acne instances continue into adulthood, and it affects 95–100% of 16–17-year-old males and 83–85% of 16–17-year-old girls. Negative effects on one's quality of life, self-esteem, and physical and mental health are common symptoms. Acne is most common on the back (61%), the chest (45%), and the face (92%), where pilosebaceous glands are most numerous. Scarring may happen as acne heals; every kind of acne, from nodulocystic to papules, pustules, comedones, and more, can produce scarring (1).

The psychological anguish and potential social inhibition caused by scarring increases in proportion to the severity of the scarring, making it an already heavy weight to bear. Suicide, despair, poor academic performance, and unemployment are all linked to acne scars, which in turn lower quality of life (2).

The three primary forms of acne scars may be classified by the net loss or growth of collagen: atrophic, hypertrophic, and keloidal. The most prevalent kind of acne scars are rolling, boxcar, and ice-pick scars. More severe scarring has been linked to treatment delays. This emphasizes the need of treating acne scars promptly and effectively (3).

Treatment options for acne scars differ based on the severity of the scars and the limits of available treatments. Acne scar treatment options include chemical peels, dermabrasion, laser therapy, punch methods, fat transplantation, needling, subcision, and combination therapy. The use of several therapeutic methods has been limited due to their limited effectiveness and significant adverse effects (4).

The face lift procedure makes use of a variety of thread types chosen for their ability to stimulate collagen production. Threads are known for their long-lasting effects and biocompatibility. Threads made of smooth polydioxanone (PDO) have the potential to produce more collagen and last longer than other varieties (5).

The researchers set out to determine if dermal threads were safe and effective in reducing the appearance of acne scars.

Materials and methods

**Data Sources:** Dermal threads' function in acne scar therapy up till the year 2024 was determined by exploring and analyzing Medline databases (Pub Med and Medscape).

**Study Selection:** The inclusion of all research was determined by separate evaluations. Inclusion was contingent upon them meeting the following requirements: With an English language publication, Explore the use of dermal threads as a remedy for acne scars in articles published in scholarly publications.

**Data Extraction:** Research was not considered for inclusion if it did not meet certain requirements. The study's quality was evaluated based on a number of factors, such as the following: the availability of acceptable controls, sufficient information, clearly defined evaluation measures, and whether or not ethical permission was obtained. We used a data collecting form to independently extract information relevant to our research results from all qualifying studies.

Review of literature

**Pimple scars**

A lot of people in their teen and early adult years deal with acne vulgaris, a persistent inflammatory condition of the pilosebaceous unit. Approximately 27% of preteens and up to 93% of late teens are impacted. The face, chest, and upper back are common locations for acne, which often appears as comedones. A subcutaneous abscess, red papules, and pustules are the hallmarks of inflamed lesions. Acne has societal impacts that lower patients' quality of life (6), in addition to causing serious medical and psychological consequences.

- **Disease mechanisms**

Multiple steps culminate in acne's development inside the pilosebaceous unit. to hyperseborrhea (excessive sebum) and changes in the fatty acid composition of sebum, disruptions in the hormone microenvironment, interactions with neuropeptides, hyperkeratinization of follicles, inflammation induced, and impaired innate and adaptive immunity are some of the main features that underlie the development of acne. These changes disrupt the pilosebaceous unit's ability to execute its job, which in turn causes regular pores to become microcomedones, and then comedones and inflammatory lesions. Inflammation may be exacerbated by bacterial antigens. Scarring from acne lesions may last a lifetime. Scarring may be influenced by a variety of variables, the most important of which are heredity, the severity of the illness, and lack of therapy (7).

- **Acne scar categorization**

Atrophic scars are characterized by a net loss of collagen, while hypertrophic scars are characterized by a net increase of collagen. Although some patients may develop hypertrophic scars or keloids, the vast majority of acne scars are of the atrophic type (8).

**1- Reduced scar tissue**

The subtypes of atrophying acne scars identified by Jacob et al. (9) include ice pick scars (figure 1), boxcar scars (20%-30%), and rolling scars (15%-25%).

Icepick scars go vertically to the deep dermis or subcutaneous tissue and are thin (less than 2 mm), deep, and strongly marginated epithelial tracts. The surface aperture is often larger than the deeper one, however this is not always the case (figure 1) (9).

Dermal tethering causes rolling scars, which are often broader than 4 to 5 mm and appear on otherwise normal-looking skin. The dermis may take on a rolling or undulating look when there is an abnormal fibrous anchoring to the subcutis. Despite their shallowness, the subdermal tether hinders therapy from above. For the therapy to be successful, it is crucial to correct the subdermal component (figure 3) (9).

Like varicella scars, boxcar scars are depressions that are spherical or oval in shape and have highly defined vertical borders. Unlike icepick scars, which narrow to a point at the base, these wounds are clinically broader at the surface. Figure 4 shows that they may be either shallow or deep (9).

**2- Keloidal and hypertrophic scars**

They are linked to reduced collagenase activity and an overabundance of collagen. Histologically, hypertrophic scars are no different from other types of dermal scars; they are pink, elevated, and stiff; and they include thick hyalinized collagen bundles that stay within the boundaries of the initial injury site. On the other hand, keloids are histologically identifiable by thick whorls of hyalinized acellular collagen and manifest as reddish-purple papules and nodules that spread beyond the initial wound margins. Scars that are hypertrophic or keloidal tend to be more prevalent on the trunk and are more frequent in those with darker skin (8).

Scarring that occurs after acne has healed has been categorized and graded in a number of ways. Acne scars are categorized into four primary classes according to the qualitative global scarring grading system that was proposed by Goodman and Baron (10). Flat macular markings free of atrophy and hypertrophy are grade 1. Grade 2 atrophy or hypertrophy is modest, may be readily hidden, and may not be seen at social distances of 50 cm or more. If the scarring is somewhat atrophic or hypertrophic, it is visible at social distances of 50 cm or more, not readily hidden, and may be flattened by physical stretching of the skin (if atrophic). This is grade 3. Scarring of atrophic or hypertrophic severity that cannot be reduced by hand stretching is included in grade 4. It is a simple and widely acknowledged categorization. The same writers later on developed a numerical scale

that takes scar kind and scar count into account. Macular and mild atrophic scars get less points in this method compared to moderate and severe atrophic scars.

**Medical Therapy**

Patients with acne scars have access to a wide variety of successful therapies, but not every scar is amenable to the same surgery. Several treatments (such as resurfacing, lifting, excision procedures, and others) are often necessary, and it may be necessary to repeat certain procedures at specific intervals to keep the improvement.Laser resurfacing is one example of a resurfacing therapy that removes skin layers in a top-down fashion. Researchers believe that dermal remodeling and neocollagenesis may occur when resurfacing techniques injure the dermis. In order to make the skin smooth, lifting techniques (like fillers) try to lift the base of a deep scar up toward the surface. Table 1 shows that scars are entirely removed by excision methods, such as punch excision.

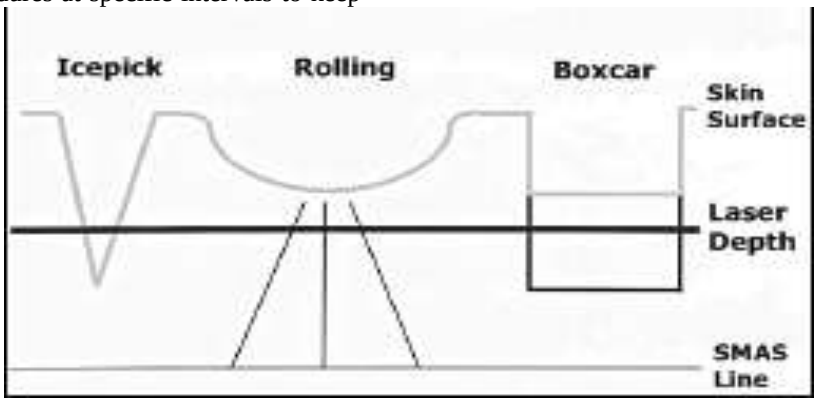


**Fig (1):** Acne scar subtypes **(9)**

**Fig (2):** Icepick scars **(9)**

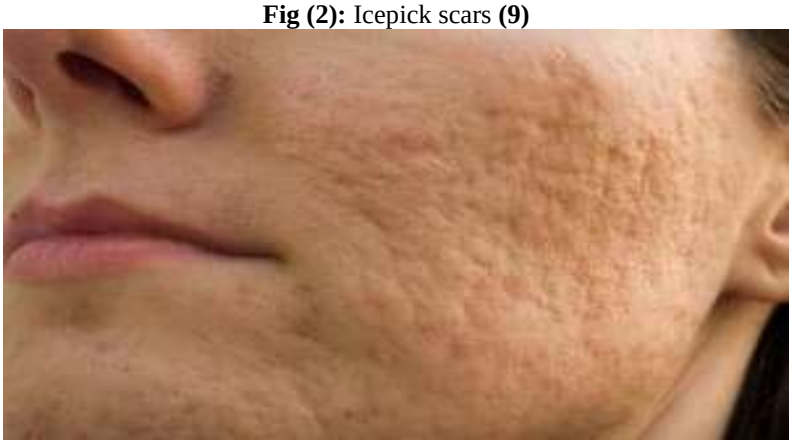

**Fig (3):** Rolling scars **(9)**

**Fig (4):** Boxcar scars **(9)**

**Table (1):** Acne scar procedures grouped by procedure type **(11)**

| |
|---|
| ***Resurfacing procedures*** |
| Chemical peels<br>• Full face<br>• CROSS technique |
| Dermabrasion |
| Laser resurfacing<br>• Ablative / non ablative<br>• Fractional |
| ***Lifting procedures*** |
| Subcision |
| Fillers<br>• Directly under scars<br>• Volumizing<br>• Autologus fat transfer |
| Punch elevation |
| ***Excision procedures*** |
| Punch excision |
| Elliptical excision |
| Punch grafting |
| ***Others*** |
| Skin needling |
| Face lift |
| Combination techniques |

**Skin strands**

The face lift procedure makes use of a variety of thread types chosen for their ability to stimulate collagen production. Threads are known for their long-lasting effects and biocompatibility (12). Although the patient's neck scar had previously shown resistance to other treatments, Dubin et al. (13) were able to alleviate its symptoms by using PDO threads. The tread therapy was effective in reducing the scar, and that effect persisted even after 24 weeks.

In addition, Ko et al. (14) successfully treated forehead wrinkles with multi-PDO threads, which, when inserted, produce a filling effect comparable to that of filler materials with larger surrounding capsules and, more importantly, serve as a reservoir for collagen synthesis.

Subcision alone and subcision with poly-L-lactic acid (PLLA) threads were both tested for safety and effectiveness in treating facial atrophic scars by Elrefaei et al. (15). They found that atrophic scars may be safely and effectively treated with a combination of subcision and PLLA thread injection; even after only one session, the results were noticeable.

Subcision alone or in conjunction with poly-l-lactic acid (PLLA) threads was tested for its effectiveness in treating atrophic post-acne scars by Ebrahim et al. (16). They came to the conclusion that threads used in conjunction with subcision may provide a more substantial clinical improvement in acne scars compared to subcision alone.

**Conclusions**

The current research found that dermal threads improved the appearance of both boxcar and rolling scars, and they were well-tolerated by the participants. This therapy is a viable option for treating moderate to severe acne scars, and it comes with the additional benefit of requiring less downtime.

**References**


[1] Tan J, Beissert S, Cook-Bolden F, et al. Impact of facial atrophic acne scars on quality of life: A multi-country population Based Survey. Am J Clin Dermatol 2022; 23: 115- 123.

[2] Sood S, Jafferany M, and Vinaya Kumar S. Depression, psychiatric comorbidities, and psychosocial implications associated with acne vulgaris. J Cosmet Dermatol 2020; 19(12): 3177-3182.

[3] Bahl A, O'Connor K, and Chung HJ. Treatment of atrophic acne scars with combination therapy of chemical reconstruction of skin scars method and fractionated nonablative laser: A retrospective analysis. J of Cosmet Dermatol 2020; 19(10): 2591-2595.

[4] Amer A, Elhariry S and Al-Balat W. Combined autologous platelet-rich plasma with microneedling versus microneedling with non-cross-linked hyaluronic acid in the treatment of atrophic acne scars: Split-face study. J Dermatol Ther 2021; 34: e14457.

[5] Alberto D and Gabriele R. Thread lifting of the midface: a pilot study for quantitative evaluation. J Dermatol Ther 2021; 34: e14958.

[6] Al-Hammadi A, Al-Ismaily A, Al-Ali S et al. Topical, Biological and Clinical Challenges in the Management of Patients with Acne Vulgaris. SQU Medical Journal 2016; 16(2): 152–160.

[7] Das S and Reynolds V. Recent advances in acne pathogenesis: implications for therapy. Am. J. Clin. Dermatol 2014; 15: 479–488.

[8] Fabbrocini G, Annunziata, D'Arco V et al. Acne Scars: pathogenesis, classification and treatment. Dermatol Res Pract 2010; 1–11.

[9] Jacob C, Dover J and Kaminer M. Acne scarring: A classification system and review of treatment options. ***J Am Acad Dermatol*** 2001; 45: 109–117.

[10] Goodman G and Baron J. Postacne scarring: A qualitative global scarring grading system. ***Dermatol Surg*** 2006; 32: 58–66.

[11] Fife D. Practical evaluation and management of atrophic acne scars: tips for the general dermatologist. J Clin Aesthet Dermatol 2011; 4: 50–57.

[12] Aitzetmueller MM, Centeno Cerdas C, Nessbach P, et al. Polydioxanone threads for facial rejuvenation: analysis of quality variation in the market. Plast Reconstr Surg 2019; 144: 1002e–1009ee.

[13] Dubin D, Lin M, Akselrad M, et al. Polydioxanone threads for atrophic neck scars. Dermatol Surg 2020; 47: 751–753.

[14] Ko H, Choi J, Moon H, et al. Multi-polydioxanone (PDO) scaffold for forehead wrinkle correction: a pilot study. J Cosmet Laser Ther 2016; 18: 1–11.

[15] Elrefaei NMH, Mohamed W, El Attar YA et al. Comparative study between the efficacy of subcision versus subcision with poly-L-lactic acid threads in facial atrophic scar treatment. *Tanta Med J*. 2021;49(1):48-52. doi: 10.4103/tmj.tmj_82_21.

[16] Ebrahim HM, Nassar A, ElKashishy K, et al. A combined approach of subcision with either cross-linked hyaluronic acid or threads in the treatment of atrophic acne scars. J Cosmet Dermatol 2022; 21: 3334–3342.