

## Subcision Treatment of Acne Scars

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**Key Words:** acne scars, icepick, rolling, boxcar, subcision treatment

### Abstract

**Background:** Many therapeutic modalities have been developed to attempt cosmetic correction of acne scarring, including ablative laser resurfacing, chemical peeling, dermabrasion, punch techniques, subcuticular incision (subcision), injection of dermal fillers, and most recently fractional photothermolysis. This article discussed specifically on the treatment of subcision. Subcision (subcutaneous incisionless surgery) is a surgical intervention that is used to treat a variety of skin depressions, including atrophic acne scars, depressed scars, wrinkles, striae, and cellulite, using a Nokor needle or hypodermic needle.

### Introduction

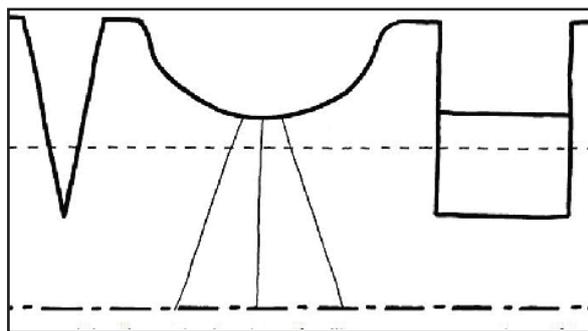
Acne vulgaris is a multifactorial disorder of the pilosebaceous unit. The clinical picture can vary significantly, from mild comedonal acne to fulminant systemic disease. Although all age groups may be affected by its many variants, it is primarily a disorder of adolescence. The economic as well as the psychosocial impact of acne is undeniable, often creating self-consciousness and social isolation in those affected. Recent insights into the pathogenesis of acne have aided significantly in further defining the subtypes of acne and establishing effective treatment regimens [1].

Facial scars are induced by surgery, vaccination, burns and skin disease such as acne or varicella. The colour, size and shape of the scars are determined by local cellular and humoral responses [2].

These wound repair events can be grouped into three overlapping phases: inflammation,

tissue formation, and matrix formation and remodelling. The inflammatory phase is followed by granulation tissue formation that consists of a dense population of macrophages, fibroblasts and neovasculature. In the months following granulation tissue formation there is a progressive reduction in the number and the activity of fibroblast and vasculature accompanied with deposition, remodelling and rearrangement of collagen. Collagen remodelling during scar formation is dependent on the balance between collagen synthesis and catabolism [3].

Acne scarring originates from a deep inflammatory reaction and involves the destruction or loss of connective tissue with dermal atrophy and fibrosis. During the maturation phase, the scar contracts and pulls the surface layers, causing indentation of the skin, resulting in atrophic scars, the most common type of postacne scarring [4].



**Figure 1.** Acne scarring types; icepick, rolling, boxcar [6]

### Classification of acne scars

Acne scarring can be divided into 3 basic types: icepick scars, rolling scars, and boxcar scars (Figure 1). Boxcar scars can be further subdivided into shallow or deep [5].

#### *Icepick scars*

Icepick scars are narrow (<2 mm), deep, sharply margined epithelial tracts that extend vertically to the deep dermis or subcutaneous tissue. The surface opening is usually, but not always, wider than the deeper infundibulum as the scar tapers from the surface to its deepest apex.

#### *Rolling scars*

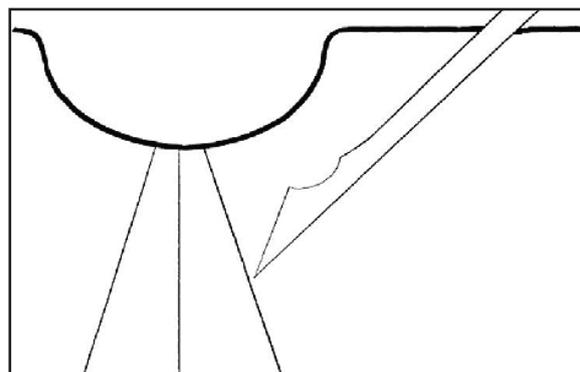
Rolling scars occur from dermal tethering of otherwise relatively normal appearing skin and are usually wider than 4 to 5 mm. Abnormal fibrous anchoring of the dermis to the subcutis leads to superficial shadowing and a rolling or undulating appearance to the overlying skin.

#### *Boxcar scars*

Boxcar scars are round to oval depressions with sharply demarcated vertical edges, similar to varicella scars. They are clinically wider at the surface than icepick scars and do not taper to a point at the base. They may be shallow (0.1-0.5 mm) or deep ( $\geq 0.5$ mm) and are most often 1.5 to 4.0 mm in diameter. Other less common scars such as sinus tracts, hypertrophic scars, and keloidal scars may occur after acne treatment [5].

### Grade of acne scars

Grade of acne scars can be divided into 4 basic types [4, 7].



**Figure 2.** Schematic depicting subcision with the NoKor needle. Fibrous bands extend from underside of the dermis to the superficial musculoaponeurotic system [5]

Grade I scarring is about the surface and specifically about the color. This macular scarring can be erythematous, hyperpigmented, or hypopigmented. Color is highly important to patients because people tend to judge the health and age of an individual based on the evenness of color in the skin.

Grade II acne scarring is again mainly about the surface but maybe more specifically about the dermis. It denotes mild, atrophic, or hypertrophic disease that may not be obvious at a social distance and is easily covered with makeup. This type of scarring is due to highly altered collagen reflectance, loss of skin glow, and shadows cast by the scars.

Grade III or moderate scarring involves moderate atrophic or hypertrophic scarring obvious at conversational distance but able to be flattened through manual stretching of the skin. This scarring is not easily covered by makeup.

Grade IV postacne scarring is usually nondistensible and describes severe atrophic or hypertrophic scarring obvious at conversational distance and not able to be flattened by manual stretching of the skin.

### Treatment choice acne scarring

Many therapeutic modalities have been developed to attempt cosmetic correction of acne scarring, including ablative laser resurfacing, chemical peeling, dermabrasion, punch techniques, subcuticular incision (subcision), injection of dermal fillers, and most recently fractional photothermolysis (Table 1). This

**Table 1.** Acne Scar Subtypes and corrective Surgical Treatment Options; +/-, with or without

Scar Type	Treatment
Icepick	Punch excision
Rolling	Subcision +/- laser skin resurfacing
Boxcar	
Shallow	
≤ 3mm diameter	Laser skin resurfacing
> 3mm diameter	Laser skin resurfacing +/- punch elevation
Deep	
≤ 3mm diameter	Punch elevation
> 3mm diameter	Punch excision or punch elevation
Post-subcision	
Punch elevation	Laser skin resurfacing
Punch excision	

article discussed specifically on the treatment of subcision.

**Subcision treatment**

1. Subcision is a surgical technique for the treatment of depressed scars. *Spangler* reported the use of a Bowmen’s iris needle to cut the fibrous strands beneath deeply depressed facial scars in 1957, *David Orentreich* and *Norman Orentreich* gave the technique the name “subcutaneous incision less surgery” or subcision in 1995 [8, 9].

For this procedure, the entire area to be subcised is marked and subcutaneous anesthetic (1% lidocaine with epinephrine 1:100,000) is administered. Once maximal vasoconstriction and anesthesia are obtained, the needle is inserted with the blade facing up wards, at the periphery of the scarred area. It is then turned so that the tip is in a horizontal orientation (parallel to the skin surface) just below the dermal subcutaneous junction plane, and gently swept across the site (Figure 2). Afterwards, antibacterial cream and a compression bandage are applied. This injury also induces connective tissue formation beneath the scar, without injury to the skin surface. In atrophic acne scars, subcision is mainly useful for rolling scars that are distensible with gentle sloping edges. Subcision is per-



**Figure 3.** The triangular tipped NoKor needle [5]

formed using atri-bevelled needle, triangular Nokor needle (Figure 3), orhy-podermic 18 to 27G needle [6, 8, 9, 10].

Risks of subcision include bleeding (which is uncommon with proper anesthesia and pressure bandages) and excessive fibroplasia leading to subdermal nodule formation. This rare outcome can be improved with low-dose intralesional steroid injections, but often resolves without treatment in 2 to 3 months. Bruising from the procedure fades within 1 week [5].

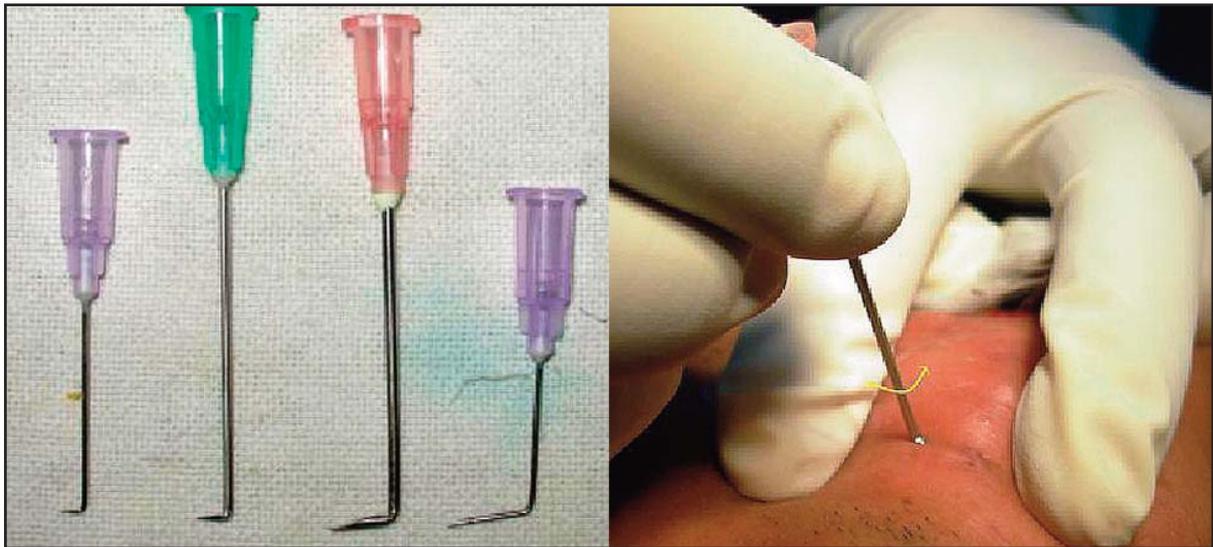
Subcision therapy is more effective than of rolling scars, but deeper boxcar scars are not eliminated by subcision. Some rolling scars, especially those on the chin and upper lip, may require more than one Subcision session for optimal improvement [5].

According to the literature, subcision treatment effectiveness particularly the rolling scars have been reported between %40-80 [11, 12].

Needle tip is placed lesional area during subcision treatment several times. During this process, skin and superficial nerves may cause personal injury the needle tip is often taken out and again after of the region placement of lesions. *Khunger* and colleagues suggested making bent at 90 degrees to the distal tip of the needle to prevent complications that may occur (Figures 4 and 5) [10].

In another clinical study, subcision therapy using 24 G needle tip were determined less traumatic, less painful, smaller hematoma formation compared to 18 G to 20 G needles [11].

The pulsed carbon dioxide laser systems improve the appearance of acne scarring successfully at least 50% by resurfacing techniques. Mild-to-moderate acne scarring



**Figures 4 and 5.** Needles can be customized according to the size of the scar by modifying the length of the angled portion [10]

may show more improvement than severe cases and saucer-shaped atrophic and macular scars show more improvement than ice-pick scars. Preliminary observations suggest that a combination of punch excision of the ice-pick-type acne scar followed by pulsed carbon dioxide laser resurfacing might be beneficial. Subcision treatment may prove a further useful adjunctive to laser therapy [3].

Scar subcision alone results in a similar degree of improvement with the pulsed carbon dioxide laser; however, the combination of scar subcision followed by laser resurfacing with

pulsed carbon dioxide laser shows a significantly greater improvement [3].

A high concentration of trichloroacetic acid (95–100% TCA) applied focally to atrophic acne scars has been histologically shown to increase collagen fibers in the dermis and to result in shallower depth of acne scars [13]. This is called the chemical reconstruction of skin scars (CROSS) method. The CROSS method has been described for the treatment of atrophic scars, especially of the ice pick type. Rolling acne scars respond better to subcision than TCA 100% CROSS, with a



**Figures 6 and 7.** Patients pictures before and after the subcision treatment

significantly greater decrease in scar depth and size on the subcised side [4].

The CROSS method is used to maximize the effects of TCA and to overcome complications such as scarring and postinflammatory hyperpigmentation and hypopigmentation, which are known to develop frequently in dark-skinned patients [14].

In another study, dot peeling, subcision and fractional photothermolysis used a combination of treatment. At the end of treatment, 80% of patients recovered [15].

### Conclusion

As seen in our patients (Figures 6 and 7) subcision appears to be a safe technique that may provide significant long-term improvement in the “rollingscars” of selected patients. When complete resolution of such scars do not occur, combining subcision with other scar revision procedures or repeat subcision may be beneficial.

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