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Low-tech Treatments for Acne Scarring: CROSS, Subcision, and Injectables

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Introduction

Dermatologists routinely treat acne with the objective of preventing acne scarring. Once control of acne has been achieved, our patients are often keen to improve textural skin changes such as atrophic acne scars. We often equate the management of atrophic acne scars with the need to reach for high-tech devices such as resurfacing lasers or radiofrequency-microneedling. While these modalities can play a pivotal role in resurfacing the skin, low-tech treatments can also be used in monotherapy or combination treatment to improve specific types of acne scars. In this article, we discuss the CROSS technique, subcision, and the use of injectables for acne scars.

CROSS Technique

CROSS is an acronym that stands for Chemical Reorganization of Skin Scars.¹ It is a technique whereby a chemical peeling agent is carefully placed at the bottom surface of an acne scar to increase collagen deposition and decrease scar depth. The putative mechanism of action is focal precipitation of proteins and coagulative necrosis leading to neocollagenesis.¹

This technique is well-suited for ice-pick scars, which are notoriously difficult to treat with resurfacing



Figure 1. Frosting occurring seconds after application of 88% carbolic acid to ice-pick scars; courtesy of Vincent Richer, MD, FRCPC

modalities. Care must be exercised to avoid treating beyond the limits of the scar to avoid scar spread, the most concerning complication associated with this treatment. This can be done using a toothpick, split wooden cotton applicator or even the needle of an insulin syringe.²

The CROSS technique has been performed primarily using trichloroacetic (TCA) acid at concentrations of 50-100%.³ Several concentrations and treatment protocols have been reported. Higher TCA concentration (100% vs 65%) and a greater number of treatment sessions (6 rather than 3) are associated with improved outcomes. Peel depth directly correlates with the concentration and amount applied. Patience must be exercised when using TCA, as the frosting reaction of the skin can take minutes to establish itself, and physicians must overcome the urge to reapply a thin coat quickly which may result in overtreatment. Local crusting occurs over 5-10 days.

Post-procedure hyperpigmentation is the most commonly reported side effect, especially in Fitzpatrick phototypes IV and V patients. Post-procedure erythema has also been very commonly reported, especially in fair-skinned patients. Post-procedure hypopigmentation was less commonly reported but is a significant concern in Fitzpatrick phototype VI patients

for whom this procedure may not be well suited. The most dreaded complication of TCA CROSS is widening of the treated scar. Widening of scars is believed to occur when excess acid from the applicator spills over to surrounding tissue.

More recently, 88% carbolic acid has been used to perform CROSS technique. Carbolic acid is also known as phenol, a component of deep phenol-croton oil peels. By itself, phenol is a weaker peeling agent categorized as a medium-depth peeling agent. The literature suggests it may be a more forgiving agent when performing CROSS technique, with fewer instances of scar spread.⁴ Carbolic acid/phenol is not recommended for large area/field treatment as it may be associated with hypopigmentation and cardiotoxicity.

In the author's practice, all CROSS technique treatments are now performed with carbolic acid 88%. After cleansing the skin, the treatment is administered using a very fine paintbrush, which enables even coating of the scar walls. Care is taken to ensure the brush is just barely imbibed with peeling agent. Frosting is quickly evident (**Figure 1**), and within minutes dissipates to erythema that will evolve to crusting. Like TCA CROSS, carbolic CROSS can be used in monotherapy or in combination with other treatments



Figure 2. Ice-pick scars of the cheek improved after 4 treatments of carbolic CROSS; courtesy of Vincent Richer, MD, FRCPC

such as laser resurfacing. Several treatments are usually necessary, with 5-6 often needed to see significant change (**Figure 2**).

Subcision

Subcision is a procedure whereby fibrotic strands beneath a scar are released mechanically with a needle, a cannula or another device. It is most

relevant for treating rolling scars where tethering can be observed when the skin is pinched on clinical exam. Although it does not rely on sophisticated equipment, it is an uncomfortable procedure that does require a degree of anesthesia, usually local. One of the interesting advantages of subcision is the avoidance of post-inflammatory pigment alteration that may be seen with device-based resurfacing.



Figure 3. Improvement of rolling acne scars of the temple after 5 sessions of cannula subcision and 1550 nm fractional nonablative resurfacing; courtesy of Vincent Richer, MD, FRCPC



Figure 4. Rolling scars of the left cheek and left forehead treated with 2 sessions of injections with a low viscosity, low elasticity HA. Of note, this patient was very experienced with resurfacing laser treatments over the previous years and was very appreciative of the cosmetic correction with low downtime, despite its expected 6+ month outcome. Injecting the forehead with HA fillers is a procedure at risk of a vascular occlusion; courtesy of Vincent Richer, MD, FRCPC

Needle subcision is traditionally performed with a Nokor needle, which has a characteristically triangular tip. The needle is moved back and forth parallel to the skin surface once introduced under the scar to release underlying tethers. Cannula subcision is an interesting alternative to perform subcision over large areas.⁵ After performing a small perforation in the skin with a larger gauge needle, a 22 or 19 gauge cannula is placed under the skin and pressed back/forth under the treatment area, parallel to the skin surface. Infiltration with local anesthesia can be performed to minimize pain. Often, clicking sounds are audible to the operator and to the patient as tethers are released. Practically, the procedure requires fewer punctures of the skin since the cannulas can reach larger areas. As with needle subcision, cannula subcision requires repeat treatment. Although cannula subcision punctures fibrotic tethers, rather than completely severing them, physician and patient satisfaction scores are similar for both procedures. Communication with the patient during the procedure is helpful in order to monitor pain as well as rare vasovagal symptoms. The “pushing and pulling” sensation of the procedure is one that the majority of our patients have never previously felt, and it may be very unusual to them. Other subcision tools have been used, such as surgical wires or blunt-blade instrument (“liberators”).⁵ Edema and erythema are common and expected side effects, while ecchymosis or hematoma are unusual following subcision.

In the author’s practice, subcision is used in combination prior to laser resurfacing (**Figure 3**). It enables enhanced scar improvement per treatment session without increasing the risk of hyperpigmentation that a more aggressive laser treatment may produce, especially for our patients with skin of colour.

Injectables

Rolling scars or lipoatrophy from acne scarring may be treated by injectables that aim at re-volumizing the skin. Traditionally called “dermal fillers,” these treatments can include hyaluronic acid (HA) gels, polymethylmethacrylate (PMMA), poly-L-lactic acid (PLLA), and calcium hydroxyapatite (CaHa).

PMMA is the main injectable with an on-label indication for acne scarring. It consists of beads of PMMA within a carrier of bovine collagen. Consequently, it requires skin testing prior to treatment to test for sensitization to bovine collagen. Bovine collagen provides immediate and short-term revolumization, while PMMA beads subsequently trigger local synthesis of collagen from fibroblasts, leading to a long-lasting correction. Because these beads remain within the skin essentially permanently

and PMMA does not have a reversal agent, development of delayed-onset nodules/granulomas or the occurrence of a vascular occlusion would be especially challenging to manage.

HA dermal fillers, with their rheological versatility and reversibility, are an attractive off-label alternative to treat rolling scars.⁶ Although it may be tempting to use an HA with high viscosity/elasticity to maximize lift of the base of the scar, excess palpability of the filler can feel unnatural to patients. The “tower technique” has been described when treating rolling acne scars with fillers. It involves injecting a deeper depot of HA that is tapered off as the injection becomes more superficial. If significant fibrotic stranding/tethering is present within the acne scars, subcision prior to HA injection will be necessary. Dermatologists who inject HA fillers should be well aware of the expected recovery e.g., (pain, swelling, risk of bruising), as well as rare (delayed-onset nodules) and catastrophic (vascular occlusion) potential side effects.

In the author’s practice, a very small amount of a low viscosity/elasticity HA filler is injected with a needle very superficially in rolling scars. Tangential lighting is used to highlight the treatment area and avoid missing subtle scars. Cannula subcision is performed prior if there is evident tethering when the scar is distended/manipulated. Follow-up 2-4 weeks later usually reveals significant correction of rolling scars (**Figure 4**).

Biostimulatory fillers like PLLA and dilute CaHa⁷ can readily revolumize areas and improve rolling scars, but may be more challenging to use focally. Silicone microdroplets have been reported to treat acne scarring, however this is off label and like PMMA may be associated with late complications that may be difficult to manage due to the permanency of the product. Novel injectable treatments for acne scars, such as tropoelastin, are actively being researched.

Conclusion

Treating acne scars can be as challenging as it is rewarding. Low-tech treatments such as the CROSS technique, cannula subcision and/or injectables can be effectively and safely used in monotherapy or in combination with resurfacing treatment modalities.

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