Double vest lipodermal flaps for depressed facial scars

YN Qassim¹, AA Ali², MJ Alfeehan³, WK Albayati^{4,5}

¹College of Medicine, University of Baghdad, Baghdad, Iraq

²College of Medicine, University of Kirkuk, Kirkuk

³College of Medicine, University of Anbar, Ramadi, Al Anbar, Iraq

⁴Ghazi al-Hariri Surgical Specialties Hospital, Baghdad Medical City, Baghdad, Iraq

⁵Iraqi Board of Medical Specializations, Baghdad, Iraq

ABSTRACT

INTRODUCTION Depressed tethered scar is a common problem that can cause emotional, social and behavioural problems, especially when it involves the exposed body parts. Several techniques have been described for treating these depressed scars, but none of these can fulfil the optimal results.

AIM Evaluating the aesthetic outcome of using a double vest lipodermal flaps for treating depressed facial scars.

MATERIALS AND METHODS The study included 25 patients with depressed facial scars who underwent scar revision. Their mean age was 31 years. Under local anaesthesia, the scarred area was de-epithelialised and double dart lipodermal flaps were used for revision. Visual analogue and Vancouver scar scales were used as subjective and objective parameters of evaluation, respectively.

RESULTS All the patients followed up for five to eight months. No complications were observed during the scar healing period. Patients satisfaction according to the visual analogue scale showed an average value of 8. The mean total scale according to the Vancouver scar scale was 2.6.

CONCLUSION The new technique of using double vest lipodermal flaps is simple and offers a promising alternative for revising depressed scars.

KEYWORDS

Lipodermal flaps – Depressed scar – Scar revision

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CORRESPONDENCE TO

Waleed Albayati, E: Dr.waleed1986@yahoo.com

Introduction

Depressed tethered scar is a common problem that could cause emotional, social and behavioural problems, especially when it involves the exposed body parts.¹ Various aetiological factors play a role in the development of depressed atrophic and tethered scars. Surgical and accidental trauma, infections, post-local steroid injections are common acquired causes.^{2,3} Several techniques have been described for treating these depressed scars, but none can fulfil the optimal results. Treatment principles are directed towards releasing the depressed scar tissue from the underlying structures by subcision alone,⁴ or in conjunction with other surgical procedures.^{5–7} Some surgeons approach the problem by de-epithelialising the depressed scarry area and building up of the missing tissue by local flaps.^{8–10} We evaluate the aesthetic outcome of using double vest lipodermal flaps for treating depressed facial scars.

Materials and methods

From August 2017 through May 2019, 25 patients with depressed facial scars were involved in this prospective study; 22 women and 3 men, with ages ranging between 17 and 55 years (mean 31 years).

The procedure is completed under local anaesthesia using 2% lidocaine with 1/200,000 adrenaline. The scar is de-epithelialised in an elliptical shape. The margins of the ellipse are minimally undermined for 3–4 mm (Fig 1A). An H-configuration is marked on the raw area using a surgical marker (Fig 1B). Two adjacent lipodermal flaps are dissected off the underlying tissue (Fig 1C) and, after proper haemostasis, each flap is advanced to the base of the counterpart in an overlapping manner and fixed in place using 5/0 or 4/0 polydioxanone sutures (Fig 1D, E). The skin edges will approximate each other automatically, so a few simple interrupted stitches of 6/0 or 5/0 polypropylene

suture are needed to maintain skin edge alignment (Fig 1F). Topical antibiotic ointment and Steristrips are applied for a period of seven days. Oral cephalosporin is prescribed for three to five days as a prophylactic measure against infection. Topical scar modulating agents are prescribed for the next three to six postoperative months.

All patients were scheduled for regular follow-up visits at weekly intervals for the first month and every month for the following five to eight months. At each visit, the scar was photographed and the healing process was assessed. Patients satisfaction was analysed subjectively using a visual analogue scale composed of 10 scores. The authors assessed all the scars using the Vancouver scar scale, which was designed by Sullivan *et al* in 1990 as an objective parameter of assessment.¹¹ This scale includes four parameters: vascularity, pigmentation, pliability and height. Each parameter contains subscales with scores ranging from 0 (normal skin) to 13 (worst scar).

Results

All the scars involved the face (Table 1). All patients were followed-up for five to eight months. No complications were observed during the scar healing period. Patient satisfaction according to the visual analogue scale showed an average value of 8 (Table 2). The mean total scale according to the Vancouver scar scale was 2.6.

Figure 1 Surgical steps. A) de-epithelialisation. B) The H-configuration is marked on the raw area using a surgical marker. C) Two adjacent lipodermal flaps are dissected off the underlying tissue. D & E) each flap is advanced to the base of the counterpart in an overlapping manner and fixed in place. F) final skin closure.

Cases with pre- and postoperative results are shown in Figures 2–6.

Discussion

The aesthetic deformity of a scar is magnified if it is depressed and tethered to the underlying tissues. Hence the treatment goal should be directed to revise the scar and elevate the depressed area to lie in the same plane of the nearby surrounding tissues.⁴

Table 1 Facial parts involved by the scar

Facial part	Patients (n)
Forehead	3
Cheek	12
Perioral	7
Periorbital	1
Chin	2

Table 2 Patient satisfaction using the visual analogue scale (VAS)

Patients (n)	Satisfaction (VAS score)
2	6
3	7
11	8
9	9

VAS, Visual analogue scale.

Figure 2 Forehead scar, before surgery and after seven postoperative months

There are several surgical techniques described to correct a tethered and depressed scar; each one has its advantages and drawbacks. Subcision alone using a sharp needle or dissecting cannula can improve the scar by its releasing action and the associated new collagen formation created by micro-trauma. Inchingolo *et al* presented a simple

technique involving closed subcision using scissors and then approximating the skin with extracutaneous U-shaped stitches that are removed after 10–14 days.⁶ Subcision can provide some improvement but has no long-term durability and the stitch marking may complicate the technique.

Fat grafting has been used for treating depressed scars and contour deformities in conjunction with subcision of the tethered tissue to create a bed for the grafted fat in the dermal and hypodermal planes. This modality of treatment can improve the depressed scars by volume-increasing effect, together with the improvement of scar elasticity by mesenchymal cell secretions from the adipocytes. Volume resorption remains a challenging issue and multiple sessions of fat injections may be needed.^{1,5}

Shilpa *et al* used a dermal graft as an autogenous filler in treating 15 atrophic facial scars after two weeks of preliminary needle subcision, which releases fibrosis and induces minor trauma to establish a well-vascularised bed

Figure 3 Periorbital scar, before surgery and after five postoperative months

Figure 4 Perioral scar, before surgery and after six postoperative months

Figure 5 Cheek scar, before surgery and after eight postoperative months

Figure 6 Chin congenital soft tissue deficiency and furrow, before surgery and after seven postoperative months

for dermal grafts. The results were satisfactory for small scars and not ideal for the large one where multiple settings are required.⁷

Local flaps are adopted for depressed scar revisions because most of the grafts are absorbed over time and require new donor sites. Mallucci *et al* had satisfactory results by using a de-epithelised dermal tube to revise 35 patients with sunken, depressed scars. This technique is advantageous in filling the dead space with the scar tissue itself but might not be able to fill the dead space in case of deeper defect.⁸ Ceran *et al* described a layered dermal support in 21 depressed scars.⁹ The deep parts of the dermal layers are stitched to each other in a vertical manner and not in a tubing technique to maintain a strong derma support. However, minor hypertrophic scarring was noticed in some patients.⁹

The technique of using a bilateral de-epithelised hinge flap was described by Hwang *et al*.¹⁰ The technique involves de-epithelising the scar in an oval shape and then dissecting both ends from the underlying tissues, leaving the central third attached to the bed. Both dermal fat ends are folded as a hinge on each other and sutured in the middle. The skin is then approximated over them.¹⁰

In our technique, sliding the lipodermal flaps over each other and fixing them at their base, rather than at the midline, will approximate the skin edges to each other automatically, creating a more tension-free state on closure.

We consider that this technique is advantageous in restoring the volume by adding more than one layer of composite tissue (dermis and fat) and matching the skin edges in intimate contact for a long period during the healing process, thus minimising the risk of scar widening and hypertrophy that may complicate the other techniques. Additionally, this technique prevents all the suture lines from being at the same level, so minimising scar tethering

to the underlying tissues long term. A larger series of patients and a longer period of follow-up is essential for a more accurate analysis.

This new technique of using double vest lipodermal flaps is simple and a promising alternative for revising depressed scars; however, there are some limitations in using this technique in areas of skin covered with hair.

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