



SFS Repair and Prolong Dermal Support to Minimise the Stretched Scars after a Skin Excisional Surgery

Kim P^{1*} and Wong CH²

¹Department of Dermatology, Simply Beautiful Cosmetic Surgery & Laser Clinic, Australia

²Department of Dermatology, Cosmetic Surgery and Skin Cancer Centre, Australia

Abstract

Scars from the skin cancer surgery of the torso are highly prone to producing distensae striae. This type of scar is cosmetically unsightly. This case report demonstrates the skin closure technique that approximates the superficial fascial layer using a permanent suture. The rationale for using a permanent suture is to provide the prolong dermal support until such time the scar has sufficiently gained the strength to prevent the “stretching”. The technique and the rationale is discussed in detail in this article.

Keywords: Skin Excisional Surgery; Distensae Striae; Superficial Fascial System

Background

Removing a skin lesion from the torso using elliptical excision is a usual and a well-accepted procedure in a general dermatology, plastic surgery, and cosmetic practice. All elliptical excisions will leave a scar. A “good” surgical scar should appear as a thin flat line on the skin with no contour deformity and no stretching of the scar. ‘Distensae striae’ is a stretched scar that is depressed, widened and tend to be prevalent in the torso. This type of scar is cosmetically unsightly. When producing a cosmetically satisfying scar is desirable, especially so, in the torso of a younger patient, prevention is of utmost importance. Distensae Striae may be avoidable using the Superficial Fascial System (SFS) closure technique and a permanent suture to provide a prolong dermal support (Figure 1).

This is the case of a 30-year-old man who presented with a 30 mm Basal Cell Carcinoma (BCC) on the right mid back. S-shaped excision, S-Plasty [1], was used to remove the BCC with a surrounding 2-3 mm clear margin. Resulting skin defect as shown in (Figure 1A). In (Figure 1B), SFS layer is clearly demonstrated between the muscular fascia (white dots) and the thick dermis of the torso skin (black dots). A figure of eight suture using 4/0 Nylon was used to approximate the SFS layer, (Figure 1C). This procedure was repeated twice to precisely approximate the SFS layer and this has effectively reduced the tension across the skin wound, (Figure 1D). The external skin was precisely approximated using 6/0 Nylon as a continuous running suture, (Figure 1E). The scar left from such procedure in torso using inaccurate SFS approximation and using dissolving sutures tend to leave distensae striae on follow-up. Using our technique, even 2 years after the procedure, the scar appeared satisfactory, (Figure 1F) and the patient was satisfied with the cosmetic outcome.

Discussion

Scar on the torso and skin tension

Skin on the torso, especially the back, is constantly under dynamic tension even with our light daily routines. This tension is further intensified with the creation of a gap by removing skin lesion such as in skin cancer excision. Within the first few weeks following the surgery this compounded tension across the wound can lead to early mechanical dehiscence. In the longer term, the resulting scar can become stretched, thinned and depressed. The resulting scar, distensae striae, may not be cosmetically acceptable in some patients. For this reason, reducing the skin tension is of paramount importance in any wound closure but more so in the torso.

Controlling the skin tension

There are various surgical and suturing techniques available to reduce the tension across the surgical wound—longer ellipse, sigmoidal excision technique (S-plasty1), skin flap and graft surgery, and closing the wound in layers to provide a better dermal support. To prevent distensae striae, apart from the above-mentioned techniques, two additional factors may be useful—precise and

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*Correspondence:

Peter Sang-Hui Kim, Department of Dermatology, Simply Beautiful Cosmetic Surgery and Laser Clinic, Suite 4, Level 1, 9 Railway Street Chatswood NSW 2067, Sydney, Australia, Tel: +61 2 9411 4880;

E-mail: dr.peterkim@yahoo.com.au

Received Date: 26 Oct 2016

Accepted Date: 17 Feb 2017

Published Date: 24 Feb 2017

Citation:

Kim P and Wong CH. SFS Repair and Prolong Dermal Support to Minimise the Stretched Scars after a Skin Excisional Surgery. Remedy Open Access. 2017; 2: 1044.

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Figure 1: A. Surgical defect following S-shaped excision of Melanoma *In Situ* on the back with 10 mm clinical margin. B. Cross sectional anatomy of the SFS (white dots–deep dermis, black dots–muscular fascia, black arrow–fibrous septa connecting the deep dermis and muscular fascia). C. Buried Nylon suture to approximate the SFS layers in a Figure of 8 fashion. D. After completing the SFS closure using 3 interrupted figure of 8 sutures. E. Fine epidermal closure using 6/0 Nylon. F. Resulting Scar- 2 years post op.

intentional approximation of SFS System and providing a prolonged dermal support as to allow the scar to strengthen.

SFS closure

The Superficial Fascial System itself has a biomechanical property. It is a layer of connective tissue that links the muscular fascia to the deeper layers of the dermis. It has been shown that by SFS approximation/repair transfers tension from the dermis to the deeper tissues and it minimizes the tension to the approximated skin edges. A deliberate repair of SFS layer does provide a better control of the wound tension compared to a wound closure involving the skin or the deep dermal sutures alone. Therefore to take an advantage of SFS's biochemical property, it is critical that we identify the SFS and make an attempt to repair it during the wound closure. This technique, therefore, may reduce the chance of producing distensae striae [2,3].

'Prolonged' dermal support

Prolonged Dermal Support. One of the essential factors in reducing distensae striae is to provide a 'prolonged' dermal support during the wound healing period, which may last up to 2 years. Using non-absorbable sutures such as Vicryl, Monocryl or PDS would provide the required wound support in the short term after the surgery but it fails to provide a 'prolonged' support after it has been dissolved. SFS layer closure using nylon did provide the best tensile strength across the surgically repaired wound compared to using non-absorbable SFS closure. Even after 12 weeks after the surgery, the wound that was repaired using Nylon had far better mechanical strength than the wound that was repaired using the dissolving sutures. It is the ability of permanent sutures to provide 'prolonged' dermal support that made the difference in the mechanical strength of the surgically repaired wound [3].

Undermining

Some degree of undermining is required for an accurate approximation of the wound edges of surgical defect. However, this manoeuvre may also sacrifice the SFS by disrupting the connecting fibers between the muscular fascia and the dermis. Over-undermining of the wound edges can be counterproductive. It is important to limit the degree of undermining only as a 'need to be' basis to facilitate the effectiveness of SFS closure.

Conclusion

The concept of increasing the biomechanical strength of the surgically repaired wound using the practice of SFS closure technique and providing 'prolonged' dermal support is a simple procedure. As demonstrated in this case, it can reduce the incidence of distensae striae. A large proportion of skin excisions are now performed in the field of office-based setting, this simple technique could potentially produce a more cosmetically satisfying outcome following skin cancer surgery, especially in the torso.

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