New Standardization for Skin Closure

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Abstract

The basic principles of the closure of surgical wounds are: prevention of dead spaces, eversion of the lips, tension free and good coaptation with simple or continuous sutures, glue or staples. The choice of suture’s technique and the material to be used is the surgeon’s responsibility. The objective of this study is to propose a new standardization of skin’s closure of low cost, easily replicable and low learning curve, keeping these essential principles. 260 surgeries were performed with the technique of inverted double-points intra-subdermal with long-term absorbable sutures. Good results were obtained with low rates of dehiscence, enlarged scars and a high patient satisfaction was achieved, because they do not require removal of the stitches. The technique proved effective, easily reproducible and low cost. Thus, it is a good option in the surgeon’s arsenal.

Keywords: Sutures; Skin’s Closure; Suture Techniques; Stitches

Introduction

Mechanisms of sutures to close wounds are described from Ancient Egypt (3500 BC). Since then, several authors have developed various techniques and materials for this purpose [1].

Halsted described the basic principles for closing wounds: cleansing, hemostasis, obliteration of dead spaces, preservation of blood flow, take care with delicate tissues to prevent skin necrosis that favor infection and thus healing changes, and absence of tension [1] wounds.

Carmelo-Nunes et al, describe the importance of training the tissue’s suture – Basic Training Suture [2], especially at closing it by anatomical planes, avoiding dead spaces, with separated single points and inverted [1, 3] in the subcutaneous tissue; and emphasize the need to do the best technique to the success of the scar and better results.

The correct execution of the wound’s closure is essential for good results, both in aesthetic die as in reconstructive surgery [4]. The release of the subcutaneous tissue and the use of inverted sutures facilitate the alignment and reduction in the tension of the wound closure [4].

Johnson et al reinforces the prevention of depressed scars must be promoted with the eversion of the subdermal points [3, 4] and also the importance of to close all skin’s layers.

They add that the closure of the subcutaneous tissue does not support the wound, but only promotes the closure of dead space. The support should be conducted in subdermal layer, which retains approximated the edges, leaving only the epidermis for the alignment of the same one [1, 3]. The eversion of the lips is corrected when there is contraction of the wound, leaving the wound more aesthetic. The subdermal suture also serves to promote the leveling of the lips, preparing them for better coaptation [4].

The choice of the right technique is particular to each surgeon, but these basic principles should be respected, especially not to hold sutures too tight, causing ischemia of the lips, crusting and dehiscence [5, 6].

The most commonly practiced include separate single and continuous, horizontal U, U-shaped upright (Donati), semi-intradermal, Intradermal continuous [1, 2, 4, 6].

Kudur et al, added to the basic principles, that the coaptation of the lips and extrinsic stress resistance should be kept until the scars take on its own tensile strength 6. This idea was also shared by Johnson et al, who reported that the higher the resistance time of a suture transepidermal, better will be the healing [3].

The end result of the scar depends on factors related to the surgeon, as the choice of suture technique, the material used, the location and positioning of the suture parallel to the lines of force of Langers; and factors related to the patient, as the type of skin, race, smoking, postoperative care, rest, associated diseases [1].

The choice of the material should take into account the type of suture, wire absorption time, easeness of use and inflammatory response that it produces in the body [3], and also the behavior of the material [6] in the presence of infection.

Among the nonabsorbable wires, the ones that cause less inflammatory reaction are Polypropylene (Prolene®) and Polyethylene (Nylon®) [3]. Among the longer absorbable, we have the Polydioxo-none (PDS®), in approximately 180 days, and is monofilament (lower inflammatory reaction). It maintains its tensile strength for 28 days [7].

Other options have been the use of clamps, used in large wounds

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wounds because they are easy to apply and the shortening [1] surgical
time, and the use of glues that can be used with subdermal sutures [1,
3, 8], because they give a tensile strength similar to a 5-0 suture [4, 8].
They may also be used alone, as demonstrated by Greene et al, com-
paring them to 6-0 Prolene®, with similar results in higher blepharopla-
sties [9].

Among the tissue adhesives, the most used are the Octyl-2-Cyano-
acrylate (Dermabond™) and Etyl Cyanoarylate-2-(Epiglu™), which
have advantages common to cyanoacrylates, such as the redu-
tion of surgical time, resistance to the action of exudates, sealant effect, bacte-
ricide and hemostatic action [4, 9, 10, 11, 12].

The purpose of this paper is to present a new standardized method
for skin closure, easily reproducible, with a low learning curve and
based on the basic principles of wound closure cited. It is applicable
to various types of procedures, has low cost compared to the use of
glue, does not leave marks outside as conventional sutures and does
not require removal of points. It maintains the tensile strength of the
wound for a long period of time, collaborating with the expectancy of
good results.

Closure techniques can affect wound healing with significant
consequences if the incision does not heal properly.

Materials and Methods

The technique was used in 260 surgeries performed in the period
1 June of 2009 to May 31 of 2011, in patients of both sexes, aged 16-75
years, from the author’s private clinic.

The proposed procedure for closure of wounds begins by suturing
the subcutaneous tissue with simple inverted mononylon, to obliterate
dead space. Subsequently, the suture is used simultaneously at the
intradermal and subdermal layers by a double dot-inverted, intra-
subdermal 0.5 cm distance between them, with PDS®. Between a
stitch and another, we leave a distance of 0.5-1.0 cm. It should be
noted that first becomes the intradermal point, and then the subde-
rmal one, so that the node be in that plane, and thus deeper.

Of the total of 260 surgeries were performed 39 Lipoabdomino-
plastys, 2 mini-Lipoabdominoplastys, 55 mammoplasty, 39 placement
of breast implants, 4 settings of glutal implants, 1 calf implant, 66
classic or anchor abdominoplastys, 11 flancoplastys, 4 torsoplastys, 4
thoracoplasts both sides, 10 dermoliectomies of the thighs, 3 arms
dermoliectomies, 11 breast reconstructions, 11 unsightly scars,
modes associated and isolated [Figure 1-7].

Figure 1: Inverted intradermal suture.

Figure 2: Inverted intradermal suture.

Figure 3: Inverted intradermal suture (first stage).

Figure 4: Inverted subdermal suture.

Figure 5: Inverted subdermal suture (second stage).
Results

3 of 39 lipoabdominoplasties had partial suture dehiscence; 4 of 55 mammoplasties had partial dehiscence, 2 partial enlarged scars post thoracoplasties and torsoplasties. 6 of 66 Classic or anchor dermolipectomies post-gastroplasty had partial enlarged scars; 1 of 10 thigh’s dermolipectomies had partial dehiscence of the T joints and 1 of the 3 arm’s dermolipectomies had partial enlarged scars. We found no complications in any of the mini-lipoabdominoplasties, breast prosthesis and Corrections unsightly scars [Figure 8-21].

Figure 6: Double inverted intra-subdermal suture.

Figure 7: Eversion and coaptation of the lips, knhot in the deep layer (detail).

Figure 8: lipoabdominoplasty before and post 2 months.

Figure 9: Mamoplasty before and post 1 month.

Figure 10: Anchor abdominoplasty before and post 1 month.

Figure 11: Classic abdominoplasty before and post 1 month

Figure 12: Torsoplasty before and post 2,5 months.
Figure 13: Anchor abdominoplasty before and post 3 months.

Figure 14: Gluteal Implants before and post 1 year.

Figure 15: Mammary reconstruction before and post 1 year.

Figure 16: Mammary reconstruction before and post 1 year.

Figure 17: Lateral toracoplasty + flancoplasty: before and post 3 months.

Figure 18: Arm’s dermolipectomy before and post 3 months.

Figure 19: Mastopexy before and post 5 months.
Discussion

For good aesthetic and functional results of wound closures is too much important to respect the obliteration of dead spaces, the eversion of the wound margins, reducing tension on the suture, and the good coaptation of the edges. The choice of the technique to perform it is personal of each surgeon; and must consider the type and location of the suture, the quality of the skin, the cost of the material to be used, the duration and the type of skin reaction front this material. Several methods appear to be favorable and the learning curve the guide to the choice of surgeon.

The proposed technique was performed in a large sample of surgeries, in different parts of the body, in patients of different ages and qualities of skins, which makes it reliable as to its use. The fact of using double suture, reduces the tension in a single point, which promotes a better distribution of tension at the segments of 0.5 to 1 cm. Another relevant fact is the possibility of better accommodation of the tissue of the wounds. The use of the intradermal suture first, promotes coaptation of the wound’s edges, and the subdermal suture, the tensil free and eversion of the wound’s margins. With this order, the Knots tends to be in a deeper layer, to prevent extrusion of them. This technique dispenses the use of continuous intradermic suture, that causes discomfort at the time to remove them. And also external sutures, which marks the skin like fishbones . The fact of the association of common inverted intradermal and subdermal sutures, makes the learning curve low and the technique with high reproducibility.

The results encouraged us because of the low rates of complications and small proportions of them, when they occurred. Another relevant factor was the ease and technical quality of the scars obtained, a fact that generated a lot of patient satisfaction.

Conclusion

The proposed technique was effective, profitable and easy to use, without violating the basic principles of good Wound closures. The learning curve is low and it had low taxes of complications.

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