

Use of a Buried Intradermal (Subcutaneous) Running Suture for Superficial Repair to Optimize Cosmetic Outcome

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ABSTRACT

Superficial repair after excisions helps to optimize cosmetic outcomes. Possibly due to how wound closures are traditionally taught in dermatology, simple interrupted or continuous sutures are overwhelmingly favored by dermatologic surgeons in superficial repair, especially on cosmetically sensitive areas such as face and ears. However, this repair method risks wound overgrowth around the points where the suture traverses through the epidermis, and long-term postsurgical healing frequently leaves behind scars with 'railroad track' suture marks rather than a fine line.

Here, we present buried intradermal running suture technique as an alternative superficial repair method compared to the simple interrupted or running suture techniques. We demonstrate the superior cosmetic outcome offered by buried intradermal suture with 2 patient cases, who had defects on the temple and shin. While dermatologists can now offer energy-based devices and neuromodulators to improve cosmesis, our approach helps optimize scar appearance so that patients can have the best possible surgical outcome without necessitating further interventions.

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INTRODUCTION

Superficial repair after excisions helps to optimize cosmetic outcomes. While playing a minor role in providing structural integrity, superficial closures primarily serve to improve wound edge approximations. In most dermatologic surgeries, this repair involves a non-absorbable suture in a simple interrupted or running pattern that captures the entire thickness of epidermis with each stitch.[1]

However, this repair method requires puncturing the superficial epidermis adjacent to the wound edge, and the wound overgrowth around the points where the suture traverses through the epidermis can appear unsightly and/or trigger false fear of infection to patients.[2] Furthermore, long-term postsurgical healing frequently leaves behind scars with 'railroad track' suture marks rather than a fine line. In an effort to minimize these suture track marks, superficial sutures are typically removed after 2 weeks on the trunk, before the scar is mature. This can lead to undesirable scar spreading and diminished cosmesis over time. Depending on a patient's skin type and healing characteristics, these suboptimal surgical scars can become a common source of patient complaint.

Here, we present the buried intradermal (also referred to as subcutaneous) running suture technique as a superficial repair method with superior cosmetic outcome compared to the simple interrupted or running suture techniques using polypropylene (Prolene) or poliglecaprone (Monocryl) suture, which we prefer for their low friction coefficient and low tissue reactivity. When using polypropylene, we insert the needle into the epidermis approximately 1 cm away from one longitudinal end of the incision and exit at the superficial dermis at the apex of the wound. We then run the suture intradermally throughout the incision similar to that of a subcuticular suture, though we backtrack approximately 50% of the suture spacing with each stitch without locking to provide overlap. At the tail end of the incision, the suture exits the epidermis in a pattern that mirrors the opposite end. Finally, knots are tied at both free ends onto the respective suture itself to prevent loosening. When using poliglecaprone, we anchor the suture at one end of the wound with a deep buried knot, run the suture intradermally, anchor the suture at the opposing apex, and bury the knot by inserting the needle through the dermis of the apex and exiting at the epidermis approximately 1 cm away.

In areas of tension, we use polydioxanone (PDS) instead of polyglactin 910 (Vicryl) or poliglecaprone suture for the placement of our deep dermal sutures as the former offers greater retention.[3] We often leave the polypropylene suture for up to 2 months after the surgery to allow for the complete reepithelization and scar maturity. Since polypropylene has low reactivity and coefficient of friction, the suture can be easily removed. We have not experienced any significant wound dehiscence with our technique.

Examples:

Our first patient is a 73-year-old man who presented for Mohs surgery to treat squamous cell carcinoma of the right temple. The final defect size measured 1.2 x 1.3 cm and extended to the fascia. The defect was repaired with a layered linear closure using 5-0 monocryl interrupted deep sutures, followed by 5-0 monocryl intradermal sutures to approximate the epidermal edge. The final wound length measured 3.1 cm. Photos were taken immediately after surgery (Figure 1) and at 4-week follow-up (Figure 2). Suture removal was unnecessary as only dissolvable sutures were used.

FIGURE 1. Right temple surgical site immediately after repair with intradermal sutures.

FIGURE 2. Right temple surgical site 4 weeks after repair.

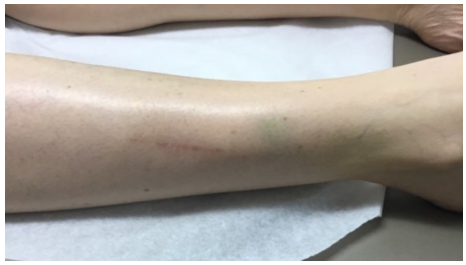
The second patient is a 33-year-old woman who was found to have a malignant melanoma in situ on her left shin (Figure 3). She had an excision performed with 5 mm margins, and the resultant 1.6 x 1.4 cm defect extended to fascia. Since she is a surgical resident and needs to be on her feet for long days in the operating room, the defect was repaired with a layered linear closure using 3-0 PDS interrupted deep sutures, followed by a 4-0 prolene running intradermal suture that was left in place for 2 months before suture removal (Figure 4).

DISCUSSION

These cases demonstrate the superior cosmetic outcome offered by buried intradermal suture. Possibly due to how wound closures are traditionally taught in dermatology, simple interrupted or continuous sutures are overwhelmingly favored by dermatologic surgeons in superficial repair, especially on cosmetically sensitive areas such as the face and ears.[1] However, scars on the trunk and extremities closed with simple interrupted suturing often result in suboptimal aesthetic outcomes. While dermatologists can now offer energy-based devices and neuromodulators to improve cosmesis, our approach helps optimize scar appearance so that patients can have the best possible surgical outcome without necessitating further interventions. By using a superficial repair method that minimizes epidermal trauma without compromising structural integrity, dermatologic surgeons can maximize patient satisfaction while providing excellent medical care.

FIGURE 3. Left shin surgical site immediately before excision.

FIGURE 4. Left shin surgical site 2 months after repair with intradermal sutures.



DISCLOSURE

All authors have no potential perceived conflicts of interest and/or financial relationships that may pertain to the subject matter in the manuscript.

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