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Case Series

Outcomes of simple looped self-removable sutures in minor dermatological procedures

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ABSTRACT

Conventional skin sutures need to be removed after a week or two, requiring a second visit from the patient as well as apprehension in both adult and pediatric cases due to the use of a surgical blade. We evaluated a "self-removable" suturing technique that allows patients or healthcare providers to remove sutures easily without sharp instruments. This knot involves a modified double throw with a remnant loop, enabling removal of the suture by gentle traction. In a pilot study of 16 patients undergoing minor dermatologic procedures, 11/14 (78.6%) sutures were successfully self-removed by the patient attendant under supervision. One had to be removed by physician and two had loosened before removal. Two patients were lost to follow-up. No gaping or delayed healing was noted.

Keywords: Dermatosurgery, Looped knot, Looped square knot, Modified suture, Self-removable sutures, Slip knot, Suturing techniques

INTRODUCTION

Skin suturing remains an integral part of wound closure in dermatologic and surgical practice. While the emphasis has traditionally been on the choice of suture material, technique, and knot security, far less attention is given to the process of suture removal, which is often a source of burden and inconvenience for both patients and healthcare providers. In developing countries, an additional visit often means loss of wages for the patients as well. Conventional interrupted sutures are frequently difficult to remove due to factors such as short suture ends, superficial crusting, and epithelial overgrowth. These issues may necessitate additional instrumentation, patient discomfort, and, in some cases, even minor trauma to the healing wound during removal. In addition, pediatric patients are often apprehensive about another procedure. This challenge is particularly farcical in minor procedures such as punch biopsies, where typically a single suture is placed. A 'slip-knot' has previously been described, with biomechanical studies revealing comparable strength and security to the conventional interrupted suture with simple surgical knot.[1,2] We evaluated an alternate, easy-to-apply, simple removable knot in a real-life setting, in patients requiring suturing for minor dermatological procedures.

CASE SERIES

This was a pilot series including 16 patients (12 females and 4 males). The mean age of patients was 36.4 ± 14 years (range 10–64 years) [Table 1]. The indications of suturing included punch

biopsies/excisions (n = 14), excision of large skin tag (n = 1), and radial cutaneous nerve biopsy (n = 1). The most common site was the face (n = 12), and other sites included the neck, forearm, and pubic region.

Informed consent was taken from all patients. Skin biopsies were done as per standard of care, under local anesthesia and all aseptic precautions, with a 4 mm punch. Radial cutaneous nerve biopsy was done on the radial aspect of the left wrist, using a vertical 2 cm incision over the palpable thickened nerve. Excision of the skin tag was done using radiofrequency, followed by suturing of the wound at the base. Suturing was done in a simple interrupted fashion with 5-0 polypropylene reverse cutting suture with 3/8 needle, by a qualified dermatologist Ananya Sharma (AS). The knot was initiated with a double throw, but instead of holding and pulling through the tip of the free end as is usual, the free end was held approximately 2–3 cm proximal to the tip, allowing a loop to be formed. The loop and short ends are then pulled in opposite directions to lock the knot, and the knot may be secured to skin using a Steri-Strip™ [Figure 1 and Video 1]. Such a knot was able to oppose wound ends and stop superficial bleeding sufficiently. The free tip of the suture was left sufficiently long so as to be easily visible and not be inadvertently buried in a scab.

For the purpose of the study, patients were instructed to follow-up with an attendant at day 7 for face and neck lesions and day 10 for extremities. Of 16 patients, 14 returned for follow-up. All the attendants received a video demonstration of the process of suture removal by gentle traction on the short free end while stabilizing the knot, enabling the loop to slip through and suture to open without the need for any instruments. Attendants were asked to wash their hands well before the procedure and wear sterile gloves. Eleven of 14 (78.6%) attendants could perform the procedure under supervision, with minimal discomfort reported by the patient in all cases [Video 2]. One attendant was too apprehensive to perform the removal, but the knot could easily be removed by the dermatologist. Two sutures had loosened before removal, one of which was applied to friable tissue post radiofrequency excision of a large skin tag in the pubic area.

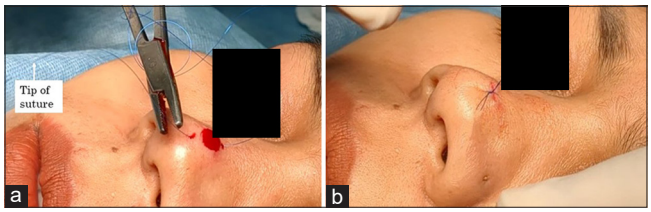

Figure 1: Tying of loop knot: (a) First panel shows holding of suture a few centimeters proximal to the tip, (b) Second panel shows tied loop knot- with successful hemostasis.

Video 1: Demonstration of self-removable sutures.

Video 2: Patient attendant removing a slip-knot suture placed on a punch biopsy, under supervision.

DISCUSSION

Slip knot technique making sutures amenable to self-removal offers several advantages. It enhances patient autonomy and comfort, reduces the need for clinic visits for suture removal, and eliminates the dependence on sharp instruments. The method is easy to master and can be incorporated into routine dermatological practice, especially in high-volume, low-resource settings.

Reports of slip knots extend back to the 1980s, first described by Sasaki and Fafuda for plastic surgery in infants.[1] This type of knot has been tested previously, with no significant difference in strength or security from that of the interrupted simple surgical knot.[2] Other authors have also emphasized the utility, as well as the fact that in 5% of cases, the loop may not slip easily due to crusting or inappropriate technique.[3] A telephonic follow-up study of 70 patients from an emergency department setting in the USA showed that all patients were able to remove their own simple sutures when provided a kit, and majority described it as easy or relatively easy (92%). Most (95%) said that they would prefer to remove their own sutures in the future.[4] However, the Indian demographic is different, and such preferences have not been evaluated. Patients are usually apprehensive to intervene by themselves in a sutured wound.

We attempted to use a further simplified method in the simplest dermatological procedures requiring suturing, mostly punch biopsies on the face. We followed up the patients for a second visit, contrary to the eventual goal of this technique, to explore whether patients in our low-resource hospital setting

Table 1: Patient demographic and follow-up details of single-loop locked suture.

S. No.	Age, sex	Procedure	Diagnosis	Site	Follow-up (day)	Outcome
1.	64, F	Punch biopsy	Discoid lupus erythematosus	Malar Area	7d	Smooth removal
2.	23, F	Punch excision	Intradermal nevus	Nose	7d	Smooth removal
3.	32, F	Punch biopsy	Borderline tuberculoid Hansen	Cheek	7d	Smooth removal
4.	47, F	Punch biopsy	Clear cell acanthoma	Face	7d	Smooth removal
5.	24, F	Punch biopsy	Benign appendageal tumor	Nose	7d	Smooth removal
6.	37, F	Radial cutaneous nerve biopsy	Pure neuritic Hansen	RCN	10d	Smooth removal
7.	52, F	Radiofrequency excision	Skin Tag	Mons pubis	10d	Knot loosening
8.	25, F	Punch excision	Halo nevus	Nose	7d	Lost to follow-up
9.	10, F	Punch biopsy	Xeroderma pigmentosum	Face	7d	Lost to follow-up
10.	44, M	Punch biopsy	Granulomatous cheilitis	Lower lip	7d	Smooth removal
11.	48, M	Punch biopsy	Steatocystoma multiplex	Neck	7d	Removed by physician
12.	47, F	Punch biopsy	Basal cell carcinoma	Face	7d	Smooth removal
13.	45, F	Punch biopsy	Discoid lupus erythematosus	Face	7d	Smooth removal
14.	33, F	Punch biopsy	Necrotic erythema nodosum leprosum	Right Cheek	7d	Smooth removal
15.	29, F	Punch biopsy	Trichofolliculoma	Forehead	7 days	Smooth removal
16.	23, M	Punch biopsy	Seborrheic melanoses	Left nasolabial fold	7 days	Knot loosening

M: Male, F: Female, RCN: Radial cutaneous nerve

were receptive to this technique and able to follow instructions. Most (11/14, 78.6%) sutures did their job and were able to be removed by the attendant. However, when done in the home setting away from an observer, this may require readily accessible instructions and a video demonstration for review. There is also possibly an increased risk of unhygienic practices. In addition, there was slippage of the knot in two cases, leading us to propose that a squared loop knot might be more secure [Video 1]. Both these techniques should be tried in larger sample sizes as well as longer incisions in the dermatology setting for generalizability, as they hold good promise for increased patient convenience and decreased hospital burden.

CONCLUSION

The self-removable looped suture can be a useful alternate to conventional interrupted sutures to avoid patients' extra hospital visits after punch biopsies.

Authors' contributions: Ananya Sharma and Somesh Gupta: Conceptualization of the idea. Ananya Sharma, Purn Pragya and Shrruthi Velavan: Carried out the procedures and followed up the patients (data synthesis, data analysis) under supervision of Somesh Gupta. Ananya Sharma and Purn Pragya: Preparation of the manuscript. Ananya Sharma and Somesh Gupta: Reviewed and edited the manuscript. Somesh Gupta is the guarantor.

Ethical approval: Institutional review board approval is not required.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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