



E-ISSN: 2616-3470  
P-ISSN: 2616-3462  
© Surgery Science  
[www.surgeryscience.com](http://www.surgeryscience.com)  
2025; 9(1): 102-104  
Received: 03-12-2024  
Accepted: 06-01-2025

**Dr. Kishore KS**  
CMRI, Karpaga Vinayaga  
Institute of Medical sciences &  
Research Centre,  
Madhuranthagam, Chengalpattu.  
Tamil Nadu, India

**Dr. Subasri S**  
CMRI, Karpaga Vinayaga  
Institute of Medical sciences &  
Research Centre,  
Madhuranthagam, Chengalpattu.  
Tamil Nadu, India

**Dr. Dharmaraj R**  
CMRI, Karpaga Vinayaga  
Institute of Medical sciences &  
Research Centre,  
Madhuranthagam, Chengalpattu.  
Tamil Nadu, India

**Rohit R**  
CMRI, Karpaga Vinayaga  
Institute of Medical sciences &  
Research Centre,  
Madhuranthagam, Chengalpattu.  
Tamil Nadu, India

**Dr. M Ramula**  
Professor of Surgery, Department  
of General Surgery, Karpaga  
Vinayaga Institute of Medical  
Sciences & Research Centre,  
Madhuranthagam, Chengalpattu.  
Tamil Nadu, India

**Corresponding Author:**  
**Dr. M Ramula**  
Professor of Surgery, Department  
of General Surgery, Karpaga  
Vinayaga Institute of Medical  
Sciences & Research Centre,  
Madhuranthagam, Chengalpattu.  
Tamil Nadu, India

## A randomised comparative analysis of Steristrips vs subcuticular sutures in adolescent hernia repair: Single institutional study

Kishore KS, Subasri S, Dharmaraj R, Rohit R and M Ramula

DOI: <https://doi.org/10.33545/surgery.2025.v9.i1.B.1148>

### Abstract

**Background:** This short-term study compares subcuticular sutures versus Steristrips for wound closure in herniorrhaphy in young adults, considering surgeon expertise, patient satisfaction, and aesthetic outcome. It also analyses post-operative discomfort, limb mobility, and cosmetic appearance.

**Aim & Objectives:** Our study compared the surgical outcomes in terms of scar quality, and wound complication rates of adolescent hernial repair wounds closed with Steri-Strip or subcuticular suturing.

**Methods:** A one-year randomised control trial was carried out on 50 adolescent patients with inguinal hernia who visited the Department of Surgery at Karpaga Vinayaga Institute of Medical Sciences & Research Centre. Adolescent patients of either sex having hernia repair were randomly assigned to have their wounds closed with subcuticular sutures or steri-strip using a simple automated randomisation table. The findings were analysed using descriptive statistics, chi-squared tests, and t-tests.

**Results:** The average age of the patients selected for the research is between 14 and 18 years. Sex distribution revealed a substantially larger number of males (32) compared to females (18). Cases with congenital hernias were diagnosed in 8 cases, whereas the remaining 42 had indirect inguinal hernias and no complications. Wounds treated using steri-strip experienced less postoperative discomfort, no wound infection, and a better scar look than wounds closed with subcuticular sutures.

**Conclusion:** The study suggests that steri-strip, a more suitable method for wound closure in daycare procedures like herniorrhaphy, is more suitable for young adolescents after hernia surgery.

**Keywords:** Steri-strip, subcuticular sutures, adolescents, daycare surgery, technical expertise, aesthetic scar

### Introduction

Wound closure is an essential component of surgical treatment, and achieving a visually acceptable and stable scar is just as vital as performing the index procedure. Suturing seeks to produce multilayer closure, the obliteration of dead areas, and the apposition of correctly everted wound margins [1]. Steri-Strips are often used for minor cuts or wounds, as well as minor surgery. They aid in wound closure by drawing both the sides of skin together without contacting the actual wound. This lowers the likelihood of bringing germs or other things into the wound. Steri-strips are sometimes a good alternative to normal sutures since they do not need to be sewn into the skin and may be simply removed when the wound heals [2].

Subcuticular sutures are put close beneath the skin's surface and run parallel to the epidermis. This approach frequently results in less obvious scarring since it reduces external stress on the skin [3]. SteriStrips used in surgery are a kind of surgical tape that is breathable and waterproof and are used to close surgical wounds. Steri-strip in adolescents after elective inguinal hernia surgery facilitates early healing without the need for suture removal. Inguinal hernia repair is a very common daycare procedure done by surgeons. According to McLoughlin., *et al.*, in their found surgical tape was as successful as Steri-strip in healing facial sutures, depending on the width and depth of the resultant scar [4]. Wound suturing is crucial in wound treatment, including suturing materials & procedures. Suturing wounds has a history that dates to the commencement of safe surgery, and wound suturing is an important aspect of wound treatment, which includes suturing materials and different types of suturing.

The Steri-Strip consists of adhesive strips that are placed across the wound to hold the edges together, unlike sutures or staples, Steri-Strips are non-invasive and do not intrude on the skin,

reducing the risk of infection. They are easy to handle, do not need technical expertise and conform to the skin, allowing for natural movement while maintaining wound closure. The material is tissue-friendly, with the possibility of air circulation, which facilitates the healing process by the availability of air to access the wound [5]. The wound will heal with a more aesthetic scar since the tension is evenly distributed across the wound. Though not suitable for deep wounds, midline wounds and wounds in mobile areas. Here we have compared subcuticular sutures and steri-strips for wound closure after herniorrhaphy based on postoperative pain assessment, postoperative surgical site infection, and post-operative scar appearance.

## Materials and Methods

This six-month prospective comparative analysis on hernia surgery was carried out in the Department of Surgery at Karpaga Vinayaga Institute of Medical Sciences and Research Centre, a suburban teaching hospital in Chengalpattu district, from January 2024 to June 2024. Adolescent patients of either sex, with the diagnosis of inguinal hernia, were included in this study, with a study population of 50 patients by purposive sampling methods. Simple computerised randomisation was used to divide sample populations into two groups: Group I had their wounds treated with subcuticular sutures and Group II treated with steri-strip. In the sixth week, the post-operative quality of the scar was evaluated based on its appearance using the visual analogue scale. Patients with a history of previous surgery, skin infections at the operation site, presence of inguinal lymphadenopathy, and below and above adolescent age were excluded from the study. Surgical consultants in a single unit operated on both groups under homogeneous conditions in terms of age, type of surgery etc. The modified Bassini procedure was the only procedure done for this study. Periodical assessments were done using a Visual analogue scale. The study documented parameters influencing scar quality, such as appearance, wound infection & discharge, after the first week, second week & after six weeks. The Patient and Observer Scar Assessment Scale (POSAS) was utilised to evaluate scar quality. The POSAS is made up of two parts: the Patient Scar Assessment Scale and the Observer Scar Assessment Scale.

Quality of scar based on neovascularization, colour change, induration, surface regularity, softness and patient scores include pruritus, pain if any, visible colour change, thickness, movement restriction by pain, and pliability. A 10-point Likert scale is employed with a minimum score of 1 when the scar feature is equivalent to near-normal skin, and a score of 10 indicates a terrible surgical scar.

The mean POSAS score, mean Patient and Observer Overall Opinion score in the 1st week & mean POSAS scores during the 6 weeks were compared and evaluated between the two groups. Means and standard deviations are used to analyse quantitative data. An unpaired t-test is used to analyse differences between study groups. Frequencies and percentages are used to assess qualitative data. Fisher and 't' tests were employed to confirm the connection between the research groups.

## Results

An evaluation of cosmetic attractiveness using a visual analogue scale is displayed in Table 1. After six weeks of post-operative care, a study revealed that, in comparison to subcuticular sutures (Group I), the scar treated with steri-strip (Group II) had a greater number of excellent scar appearances. Nevertheless, the study of the Chi-Square test revealed no significant difference ( $p > 0.05$ ) between the groups.

**Table 1:** Visual Analogue Scale used to assess patients' cosmetic looks six weeks after surgery

Visual Analogue Scale (VAS)	Group I (Sub cuticular suturing)		Group II steri-strip		P value
	n	%	n	%	
Excellent	38	76	36	72	>0.05
Good	12	24	14	28	
Total	50	100%	50	100	

**Table 2:** POSAS score is used to evaluate patients' cosmetic looks six weeks after surgery

POSAS score	Group I		Group II		P value
	n	SD	n	SD	
Patient's component	23.8	11.6	23.02	9.88	>0.05
Observer's component	26.6	5.6	26.98	8.32	>0.05

Patient satisfaction six weeks after surgery, as measured by the patient's component of the POSAS score, is shown in Table 2. Results showed that the groups' scores ( $23.80 \pm 11.60$  vs.  $23.02 \pm 9.88$ ;  $p > 0.05$ ) were similar & statistically not significant between them. It was discovered that the observer's satisfaction score, obtained six weeks after surgery, using the observer's component of the POSAS score, was similar and did not significantly differ between the groups  $26.85 \pm 5.33$  vs.  $28.79 \pm 8.32$ ;  $p > 0.05$ ). There was no discernible difference between these two groups in the current investigation ( $p > 0.05$ ). Patients in both groups had mean ages of  $14.34 \pm 15.9$ . Both research groups included a higher percentage of male patients (88.4% and 89.3%, respectively) than female patients (12.6% and 11.7%, respectively). There was no discernible relationship between the groups according to the Chi-Square ( $p > 0.05$ ). This has similarities to the postoperative scar research conducted by Jayaram *et al.* and Rao *et al.*

## Discussion

Surgeons have found that using Steri-Strip during hernia repair surgery is efficient and produces high-quality scars based on patient perceptions of comfort. Based on the verbal analogue scale (VAS) and visual analogue scale (VAS), a prospective study by Caren & Kumar *et al.* observed that 31 patients had metal clip closure and steri-strips closure. The patients in the steri-strip group reported less pain during the first week as compared to subcuticular sutures [6]. After six weeks, steri-strip closure patients showed improved aesthetic results and easier groin movement compared to subcuticular closure. In a prospective comparative analytical investigation, Ulasi *et al.* found that 89% of patients had new linear scars and 5% of patients (All in Group II) had hypertrophic scars [7]. In research on non-caesarean surgical operations, Gurusamy *et al.* found that there is no correlation between the presence of infection or non-infectious wound problems and the non-closure of subcutaneous adipose tissue [8]. Eight noteworthy variations between the two groups while utilising either visual analogue scale, wound suturing and steri-strip have advantages and disadvantages, therefore selecting a technique should consider factors such as age, comorbid conditions, kind of wound, and wound location.

When used correctly, the steri-strip application approach doesn't need more time for selected wounds. However, it isn't recommended for deep wounds, infections, or wounds in places that move. Steri-strips are a safe, dependable, and successful wound closure method according to Rogers GS, *et al.* [9] Zempsky LT, Zehrer CL *et al.* in their comparative study on wound closure found that Subcuticular sutures cause notable

inflammatory changes with oedema and erythema and more tissue damage in comparison to steri-strip<sup>[10]</sup>.

In their randomised control research, Kerrigan CL *et al.* found that Steri-Strip closure was superior to subcuticular closure for linear surgical wounds<sup>[11]</sup>. Our study also found a similar conclusion in our comparative study of these two techniques. Steri-strips were also shown to have less or no inflammatory reactions compared to Sub-cuticular sutures, had significant inflammatory reactions,

Our goal when selecting one of these methods must be to minimise hospital stays and maximise the scar's aesthetic acceptance while allowing for an early return to regular activities. Like our study on adolescents, Zempky WT *et al.* conducted a randomised controlled comparison of the cosmetic outcomes of simple facial wounds with skin closures or tissue adhesive on children ages between 1 to 18. Their findings suggested that Steri -Steri-Strip skin closure might be a less expensive option for the closure of simple facial lacerations<sup>[12]</sup>.

Historically, sutures or staples have been used to close certain wounds, although tissue adhesives have been used for many years as an alternative. An easier application process, less discomfort, no suture removal required & fewer hospital days are some of the possible benefits over traditional wound closure<sup>[13]</sup>. In several investigations, the aesthetic result and these additional secondary outcomes in their research populations have been evaluated between tissue adhesives and conventional wound closure. Tissue adhesive efficiency remains a mystery, according to research by Farion K *et al.* This is because the study parameters have a wide range that makes them non-generalizable. Fourteen as for the infrequent variations in complications, no study has been sufficiently powered to evaluate them<sup>[14]</sup>.

## Conclusion

Steri-Strip is used by surgeons to preserve scar quality and increase efficiency on simple linear scars, but not on deep wounds or movable structures like breast wounds. This is based on patient feedback about comfort and scar quality. In cases of adolescents and paediatric populations with delicate skin, tissue adhesives can be a good substitute for traditional wound closure techniques. Comparing tissue adhesives with subcuticular wound closure yields very different results in terms of scar appearance. Compared to subcuticular wound closure, they are easier to use, have fewer side effects, take less time during surgery, and cause less discomfort. Steri-strips were linked to longer closure times, fewer wound problems and increased patient satisfaction as compared to subcuticular sutures.

## References

1. Esmailian M, Azizkhani R, Jangjoo A, Nasr M, Nemati S. Comparison of wound tape and suture wounds on traumatic wounds' scar. *Adv Biomed Res.* 2018;7(1):49. DOI: 10.4103/abr.abr\_148\_16.
2. O'Leary DP, Clover AJ, *et al.* Adhesive strip wound closure after thyroidectomy/parathyroidectomy: A prospective, randomized controlled trial. *Surgery.* 2013;153(3):408-412. DOI: 10.1016/j.surg.2012.08.063.
3. Mastud K, Lamture Y, Nagtode T, Rewale V. A comparative study between conventional sutures, staples, and adhesive glue for clean elective surgical skin closure. *Cureus.* 2022 Nov 7;14(11):e31196. DOI: 10.7759/cureus.31196. PMID: 36505125; PMCID: PMC9728503.
4. McLoughlin E, Iqbal A, Patel A, *et al.* Dual steristrip

technique: A novel use of steristrips to reduce operator radiation dose during CT-guided intervention. *Skeletal Radiol.* 2019;48:1617-1620.

DOI: 10.1007/s00256-019-03211-2.

5. Lazar HL, McCann J, Fitzgerald CA, Cabral HJ. Adhesive strips versus subcuticular suture for median sternotomy wound closure. *J Card Surg.* 2011;26:344-347.
6. Buchanan PJ, Kung TA, Cederna PS. Evidence-based medicine: Wound closure. *Plast Reconstr Surg.* 2014 Dec;134(6):1391-1404. DOI: 10.1097/PRS.0000000000000720. PMID: 25415102.
7. Rao V, Dsouza C, Kumar S, Kumar A. Comparative study of thyroidectomy wound closure using tissue glue versus subcuticular suture. *Thyroid Res Pract.* 2016;13:115. DOI: 10.4103/0973-0354.193130.
8. Ulasi I, *et al.* Assessment of local wound healing complications after groin surgery: A comparative study between two wound closure techniques. *Niger J Plast Surg.* 2020;16(1):32. DOI: 10.4103/njps.njps\_9\_20.
9. Gurusamy KS, Toon CD, Davidson BR. Subcutaneous closure versus no subcutaneous closure after non-caesarean surgical procedures. *Cochrane Database Syst Rev.* 2014 Jan 21;2014(1):CD010425. DOI: 10.1002/14651858.CD010425.pub2. PMID: 24446384; PMCID: PMC11195627.
10. Zempky WT, Zehrer CL, Christopher *et al.* Economic comparison of methods of wound closure: Wound closure strips vs. sutures and wound adhesives. *Int Wound J.* 2005, 2. Available from: <https://api.semanticscholar.org/CorpusID:1792740>.
11. Kuo F, Lee D, Rogers GS. Prospective, randomized, blinded study of a new wound closure film versus cutaneous suture for surgical wound closure. *Dermatol Surg.* 2006;32:676-681.
12. Kerrigan SL, Hama K. Evaluation of a new wound closure device for linear surgical incision. *Plast Reconstr Surg.* 2010;125:188-194.
13. Zempky WT, Parrotti D, Grem C, Nichols J. Randomized controlled comparison of cosmetic outcomes of simple facial lacerations closed with Steri-Strip Skin Closures or Dermabond tissue adhesive. *Pediatr Emerg Care.* 2004;20:519-524.
14. Quinn J, Wells G, Sutcliffe T, *et al.* Tissue adhesive versus suture wound repair at 1 year: Randomized clinical trial correlating early, 3-month, and 1-year cosmetic outcome. *Ann Emerg Med.* 1998;32(6):645-649.

### How to Cite This Article

Kishore KS, Subasri S, Dharmaraj R, Rohit R, Ramula M. A randomised comparative analysis of Steristrips vs subcuticular sutures in adolescent hernia repair: Single institutional study. *International Journal of Surgery Science.* 2025; 9(1): 102-104.

### Creative Commons (CC) License

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.