



STITCH OR STAPLE: COMPARING EFFICACY, HEALING, AND COSMETIC OUTCOMES OF SKIN CLOSURE TECHNIQUES

General Surgery

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INTRODUCTION

Skin closure is a fundamental step in surgery, directly influencing wound healing, infection risk, scar quality, and overall patient satisfaction. **Skin sutures** offer **precise control over tissue approximation and tension**, making them ideal for **cosmetically sensitive areas** like the face and hands. They are versatile, cost-effective, and provide options suturing is a **core skill**, essential for mastering tissue handling, depth judgment, and knot security. However, suturing is **time-consuming**, requires **technical finesse**, and improper technique may lead to increased pain, infection, or poor scarring. **skin staplers** allow for **rapid and consistent wound closure**, reducing operative time and intraoperative contamination particularly valuable in **trauma, emergency, and high-volume settings**. However, they are associated with **higher cost, potentially less favourable cosmetic outcomes**, and **discomfort during removal**. Both methods are widely used, but there is **limited consensus** on which is superior in terms of healing, infection rates, pain, and aesthetic outcome. This study compares **skin sutures and staplers** across key clinical parameters to guide evidence-based selection and support skill development among surgery residents.

Aim

To compare the efficacy, healing outcomes, complication rates, cosmetic results, and patient satisfaction between **skin sutures** and **skin staplers** in surgical wound closure, and to provide evidence-based guidance for optimal technique selection in general surgical practice particularly useful for surgical residents in training.

Primary Objectives

- To evaluate and compare the **wound closure time** between skin sutures and skin staplers.
- To assess and compare the **wound healing time** in both groups.
- To compare the **incidence of postoperative wound complications**, including infection and dehiscence.

Secondary Objectives

- To assess **postoperative pain** using the Visual Analogue Scale (VAS) in both groups.
- To compare the **cosmetic outcomes** of wound healing using standardized scoring.
- To evaluate **patient satisfaction** regarding wound appearance and comfort.
- To analyse the **ease of technique, removal process**, and practical utility for surgical trainees.

MATERIALS AND METHODS

This was a **prospective, randomized, comparative study** conducted in the Department of General Surgery at Krishna Mohan Medical College and Hospital, Mathura, over a period of 18 months. conducted on 100 patients undergoing elective surgeries. Patients were randomly divided into two groups:

- Group A (n=50):** Skin closure with sutures
- Group B (n=50):** Skin closure with staplers

Inclusion Criteria:

- Elective surgery patients aged 14–65 years
- Clean wounds suitable for suturing or stapling

Exclusion Criteria:

- BMI > 30, HIV, uncontrolled diabetes
- Wounds with skin loss, prior infection, or poor healing potential

Outcome Measured:

Patients were evaluated for the following parameters:

- Wound closure time** (in minutes)
- Healing time** (days to complete epithelialization)
- Postoperative pain** (measured using VAS at 24 hours)
- Wound complications** (infection, dehiscence, seroma)
- Scar and cosmetic outcome** (rated by Modified Vancouver Scar Scale or Likert score)
- Ease of removal**
- Patient satisfaction** (1–10 scale)

Statistical Analysis

Data was entered in **Microsoft Excel** and analysed using **SPSS version 21.0**.

- Continuous variables** (e.g., closure time, pain score) were analysed using **Student's t-test**.
- Categorical variables** (e.g., infection rate, scar formation) were analysed using **Chi-square test**. A **p-value < 0.05** was considered statistically significant.

RESULTS

A total of **100 patients** were included, with **50 patients** in each group. The groups were comparable in terms of age, gender distribution, and BMI.

Parameter	Skin Sutures	Skin Staplers	p-value
Mean Age (years)	35.4 ± 12.1	36.2 ± 11.8	0.739
Male/Female	28/22	30/20	NS
Mean BMI (kg/m ²)	24.8 ± 3.5	24.5 ± 3.7	NS

Wound Closure Time

Skin staplers significantly reduced wound closure time compared to sutures. P value 0.021

Group	Mean Time
Sutures	12.4
Staplers	5.6

Healing Time And Infection Rate

Parameter	Sutures	Staplers	p-value
Mean Healing Time (days)	12.2	10.8	0.00038
Infection Rate (%)	16%	12%	NS

Postoperative Pain (VAS at 24 hours)

Pain scores were significantly lower in the stapler group.

Group	VAS Score	p-value
Sutures	5.6	
Staplers	4.3	0.00082

Cosmetic Outcome and Scar Formation

Parameter	Sutures	Staplers	p-value
Cosmetic Score (Likert Scale)	7.2	8.1	—
Scar Formation (%)	24%	16%	0.453

Ease Of Removal And Patient Satisfaction

Parameter	Sutures	Staplers	p-value
Ease of Removal (1–10)	4.8	8.5	0.00047
Patient Satisfaction	7.5 ± 1.2	8.3 ± 1.0	—

Wound Dehiscence And Overall Complications

Parameter	Sutures	Staplers	p-value
Wound Dehiscence (%)	6%	4%	--
Overall Complication Rate	20%	14%	—

DISCUSSION

Staplers were also associated with **shorter healing times** and **lower pain scores**, suggesting reduced tissue trauma and better early recovery. Although **infection and dehiscence rates** were slightly lower in the stapler group, the differences were not statistically significant, aligning with previous literature that found no clear superiority in infection prevention between the two techniques. One of the most significant outcomes was the **substantial reduction in closure time** with skin staplers compared to sutures. **Cosmetic satisfaction** was higher in the stapler group. While this contrasts with some earlier reports where sutures were deemed more aesthetically favourable (Rodham et al., 2023), it may reflect improved staple placement techniques and shorter tissue exposure times during closure. **Ease of removal** was significantly better with staplers, which may enhance patient compliance and reduce follow-up discomfort. This is a practical consideration for surgical residents managing postoperative care. Sutures offer superior control and adaptability in complex or cosmetically sensitive areas they require more skill and time making them an excellent training modality. Staplers, on the other hand, provide standardized, quick closure and are ideal for long, linear incisions or trauma settings.

CONCLUSION

Skin staplers provide significant advantages over sutures in terms of **faster closure, less pain, quicker healing, and better patient satisfaction**. They are especially useful in **emergency and high-volume surgeries**. However, **sutures remain essential** in areas requiring **precision and cosmetic finesse**, and are invaluable for **surgical training**. The choice of technique should be based on the **clinical context, wound type, and surgeon's judgment** to ensure optimal outcomes.

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