

# Prospective Cohort Study to Evaluate Wound Healing after Skin Closure with Skin Staplers and Nylon Suture in Open Inguinal Hernia Repair Surgery

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**Abstract:** *This study evaluates wound healing outcomes in open inguinal hernia repair, comparing skin closures done with skin staplers and nylon sutures. Conducted as a prospective cohort study at a tertiary care hospital over two months, it involved 120 participants, divided equally between the two closure methods. The study focused on assessing wound healing using the Southampton scoring system SWS, considering variables like age, hypertension, ischemic heart disease, and diabetes mellitus. Results indicated that SWS scores were significantly associated with clinical factors such as hypertension, ischemic heart disease, diabetes mellitus, and the presence of Coagulase-negative staphylococcus aureus. While the study found no significant difference in SWS between the stapler and suture groups, it identified a clear correlation between certain clinical factors and wound healing outcomes, including the need for secondary suturing. These findings contribute to the ongoing discourse on optimal skin closure techniques in surgical procedures, particularly emphasizing the role of patient-specific clinical factors in postoperative wound healing.*

**Keywords:** Inguinal Hernia Repair, Skin Closure Techniques, Southampton Scoring System, Wound Healing, Coagulase-negative Staphylococcus Aureus

## 1. Introduction

- Open Inguinal hernia repair is one of the commonest general surgical procedure performed.
- Skin staplers and nylon suture are commonest methods of wound closure.
- Various studies have been done comparing post op wound after skin closure with staplers and nylon suture for various incisions:
- Basha et al, determined that staples were associated with increased risk of wound infection. Wound complications led to decrease in patient satisfaction, however it was not statistically significant to associate staples with decreased satisfaction.
- Cromi et al, found there were equivalent cosmetic outcome amongst both closure methods.

### Aim

To evaluate wound healing after skin closure with skin staplers and nylon suture in open inguinal hernia repair surgery.

### Objectives

- 1) To assess wound healing as per Southampton scoring system following closure with skin staplers and nylon suture in open inguinal hernia repair.
- 2) To compare wound healing after skin closure with skin staplers and nylon suture in open inguinal hernia repair.

**Study Design:** Prospective cohort study.

**Study Site:** Tertiary care hospital.

**Study Duration:** 2 months.

**Sample Size:** 120 (60 in each group).

### Inclusion Criteria:

- Age > 18 yrs.
- Consent given
- Skin closure with skin staplers/nylon suture after open inguinal herniarepair with meshplasty of all units in Department of General Surgery.

### Exclusion Criteria:

- Pregnant pt.
- Emergency cases
- Patients unfit for elective surgery based on surgeon, anesthetist or medical evaluation
- Skin closure with any other type of suture, drain placed.

For the current study following parameters noted:

Age: Date of suture/stapler removal

Gender: Wound parameters at suture/stapler removal

Address: Wound parameters at postop 1 month

Phone number: Southampton wound score (SWS)

Date of Surgery: Culture taken if any

Diagnosis (Type of hernia): Secondary suturing required

Comorbidities: Procedure/intervention required

ASA: Type of Anesthesia

Type of closure

## 2. Observations

- Study enrolled 120 participants who underwent open inguinal hernia repair with meshplasty balanced equally into two groups of skin closure of skin staplers / nylon suture based on AGE, HYPERTENSION, ISCHEMIC HEART DISEASE, DIABETES MELLITUS.
- Majority of participants exhibited a SWS of 1.
- There was definite risk of wound infection with SWS of 3 or 4 among both groups.

- SWS of 3 included 3 participants in suture group while, 2 participants in stapler group, however difference was not statistically significant.
- Results indicated significant associations between SWS at suture removal and clinical factors such as HYPERTENSION, ISCHEMIC HEART DISEASE, DIABETES MELLITUS, positive Coagulase negative staphylococcus aureus, wound approximation quality and the requirement of secondary suturing.
- Secondary suturing was required for wounds with an SWS of 4.

### 3. Conclusion

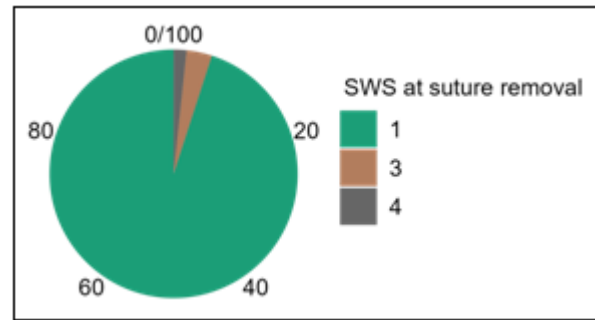
In conclusion, this study demonstrates that in open inguinal hernia repair surgeries, the type of skin closure technique skin staplers versus nylon sutures does not significantly affect wound healing as assessed by the Southampton scoring system. However, it highlights a significant association between certain clinical factors, specifically hypertension, ischemic heart disease, and diabetes mellitus, with wound healing outcomes and the necessity for secondary suturing. These findings underscore the importance of considering individual patient health profiles in surgical planning and postoperative care. Additionally, the study reveals Coagulase-negative staphylococcus aureus as the most commonly isolated organism in wound infections, providing valuable insights for infection control measures in surgical settings.

### References

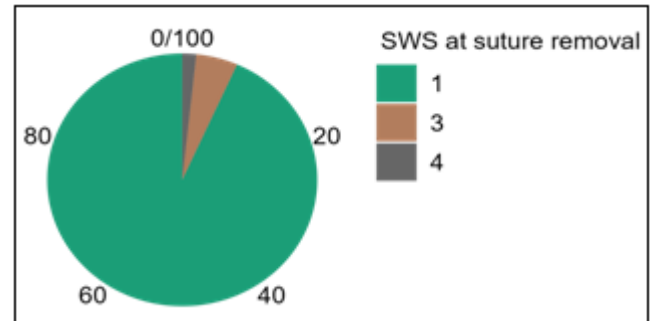
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### SWS at suture removal

#### Stapler



#### Suture



Among participants, SWS of 3 observed in 5 participants, with 2 in stapler group and 3 in suture group, while SWS of 4 observed in 2 participants, 1 in each group.