

Original Research

A Comparative Analysis of Skin Closure in Surgical Wounds with Skin Stapler and Conventional Suturing at a Tertiary care Hospital

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ABSTRACT

Background: With the development of accelerated rehabilitation and the pressures placed on surgeons to reduce lengths of stay in hospital, the method of skin closure has become increasingly important in surgical procedures. This study was done for the comparison of skin closure in surgical wounds with skin stapler and conventional suturing in orthopaedic and general surgeries. **Material and methods:** The study comprised 100 patients who underwent surgery. The surgical procedure, the means of closing the surgical wound, and its benefits and drawbacks were then explained to the chosen patients. The study enrolled those who completed the consent form and gave their permission. **Results:** It was found that with stapler the mean pain score in VAS was 1.58 ± 0.91 whereas with suture the mean pain score in VAS was found to be 4.41 ± 0.35 which was found to be statistically significant ($p < 0.05$). The time to close wounds was shorter in the staple group (mean = 4 ± 2.0 min) than the suture group (9 ± 1.2 min). There was no significant difference between the groups for complications. **Conclusion:** The study determined that skin staples are superior to traditional sutures in orthopaedic and other general surgeries due to their ability to close wounds faster.

Keywords: Suture, Staples, Incision, Surgery.

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INTRODUCTION

The technique of skin closure has increased in significance in orthopaedic surgery because to the advent of rapid rehabilitation and the demands placed on surgeons to shorten hospital stays.¹ The objective of good wound closure is rapid skin healing and an acceptable cosmetic result while minimising the risks of complications such as wound dehiscence or infection. Such complications have a considerable impact on the recovery of the patient, causing increased

morbidity and reduced patient satisfaction.² Delayed wound healing—especially in elderly patients undergoing orthopaedic and other general surgeries can prolong recovery, may progress to deep wound infection, can increase morbidity and mortality, and has cost implications.³ Hence, the aim of this study was to comparison of skin closure in surgical wounds with skin stapler and conventional suturing in orthopaedic and general surgeries.

METHODOLOGY

This was a single centre, prospective, clinical observational study conducted upon 100 patients who had undergone orthopaedic and other general surgeries. Fifty patients were selected for skin closure with staples and the other 50 patients for closure with conventional nylon sutures following surgery. The study was approved by the institutional ethics committee. The time required for closure of surgical wounds, its aesthetic outcome, post-operative complications and patients' compliance were recorded for both the groups. Patients' demographic data with study protocols were compiled in a preformed Performa. Preoperative prophylactic antibiotics was injected to all patients. All pre and per operative antiseptic precautions were taken. Skin was prepared with 10% betadine and was allowed to dry before incision was made. On completion of surgery, the process of closure was timed in seconds. Staples or sutures were placed approximately 1 cm apart. The first post-operative dressing was done at 48 hours post op. The wound evaluated and checked for any evidence of collection or infection. Staples were removed on 10-12 post operative day. Staples were removed with a device that painlessly opened them sideways, while sutures were removed in the

conventional way. Patients' adherence to having their staplers and sutures removed was noted. The VAS was used to measure pain related to stapler or suture removal. A wound evaluation score was utilized to evaluate the cosmetic appearance after two weeks. A good scar was defined as one with a 6/6 score, indicating adequate healing. Wounds with thick, broad, or elevated margins that received a score of 0/6 and were deemed to have an unsatisfactory scar during the healing process. A wound that had a score in the middle was seen as having suboptimal healing and leaving a respectable scar.

RESULTS

In this study there were 53 males and 47 females. It was found that with stapler the mean pain score in VAS was 1.58 ± 0.91 whereas with suture the mean pain score in VAS was found to be 4.41 ± 0.35 which was found to be statistically significant ($p < 0.05$). The time to close wounds was shorter in the staple group (mean = 4 ± 2.0 min) than the suture group (9 ± 1.2 min). There was no significant difference between the groups for complications. Table 3 and graph 1 shows cosmetic appearance with closing methods.

Table 1: Gender-wise distribution of subjects

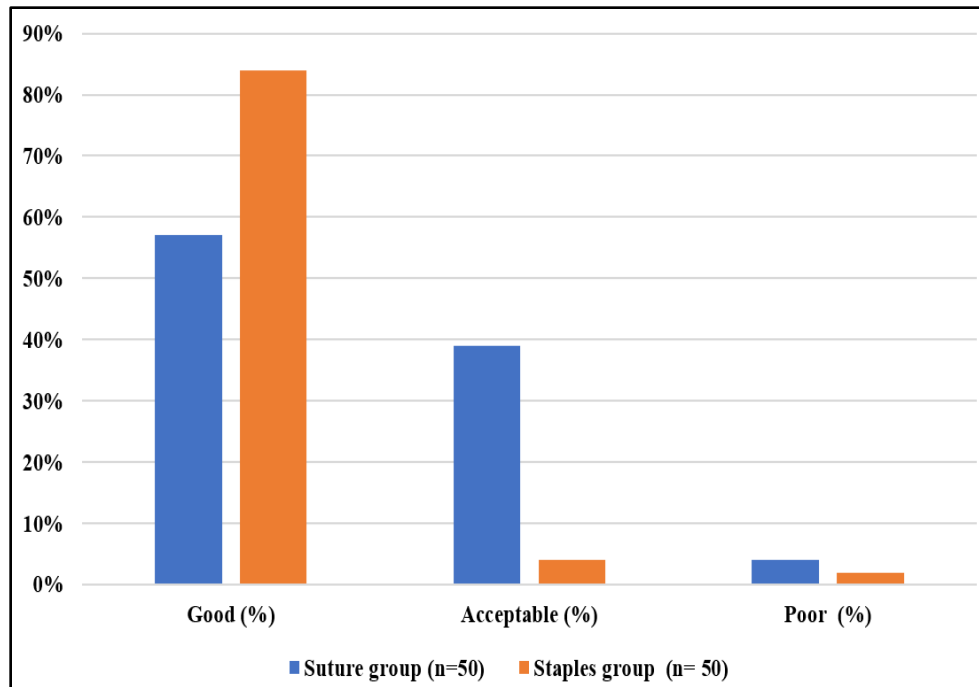
Gender	Number of subjects	Percentage
Males	53	53%
Females	47	47%
Total	100	100%

Table 2: Comparison of various parameters in two groups

Parameters	Suture group (n=50)	Staples group (n= 50)	P value
Pain score (VAS score)	4.41 ± 0.35	1.58 ± 0.91	< 0.05
Wound infections	2	3	> 0.05
Dehiscence	0	0	> 0.05
Discharge	1	2	> 0.05
Time for wound closure	9 ± 1.2 min	4 ± 2.0 min	< 0.05

Table 3: Cosmetic appearance with closing methods

	Suture group (n=50)	Staples group (n= 50)
Good (%)	57%	84%
Acceptable (%)	39%	4%
Poor (%)	4%	2%



Graph 1: Cosmetic appearance with closing methods

DISCUSSION

There are several methods for wound closure, and sutures are the most common. Newer alternatives, however, have been introduced recently, such as adhesive paper tape and tissue adhesives.⁴ There are many advantages of tissue adhesives over suturing and other methods of wound closure, such as a lower infection rate, less operating room time, good cosmetic results, lower costs, ease of use, immediate wound sealing, faster return to athletic and work activities, elimination of needle-stick injuries and eliminating the need for post-operative suture removal.^{5,6}

The present study found that skin staples were found superior to traditional sutures in orthopaedic and other general surgeries due to their ability to close wounds faster and acceptance of better cosmetic appearance. It was found that with stapler the mean pain score in VAS was 1.58 ± 0.91 whereas with suture the mean pain score in VAS was found to be 4.41 ± 0.35 which was found to be statistically significant ($p < 0.05$). The time to close wounds was shorter in the staple group (mean = 4 ± 2.0 min) than the suture group (9 ± 1.2 min). There was no significant difference between the groups for complications. In an orthopaedic surgery study carried out by Slade Shantz JA et al,⁷ sutures and staples were compared for wound closure; the staple group took less time than the suture group to close wounds. Patients in the staple group reported more pain with removal than suture group and a wound complication with no difference between sutures and staples. It was demonstrated that suturing skin requires more time and

staples are more painful to remove. In a study by Khan RJ et al,⁸ sutures were associated with less wound discharge in the first 24 hours for both the hip and the knee. However, with total knee replacement there was a trend for a more prolonged wound discharge with sutures. With total hip replacement there was no significant difference between the groups for either early or late complications. Closure of the wound with skin staples was significantly faster than with suture. There was no significant difference in the length of stay in hospital, Hollander wound evaluation score (cosmesis) or patient satisfaction between the groups at six weeks for either hips or knees. Meiring L et al⁹ conducted a study in which a disposable skin stapler was compared with conventional nylon sutures in respect of time taken for wound closure, cosmetic result and ease of application and removal. It was found that a time saving of 80% is possible with the stapling device, and that the cosmetic result with staples is as good as if not better than that with nylon sutures. A certain amount of experience and practice facilitates the use of the stapler. Closure with Nylon sutures in distal 1/3rd lower limb surgery can result with marginal necrosis especially if sutures are too tight, but it usually heals without significant complications. The advantage skin staples is its speed of execution and better surgical scar but it is also more expensive as compared to nylon sutures. But at the end, choice of suture depends on surgeons or patients preference, surgical time, availability of suture material.¹⁰

CONCLUSION

The study determined that skin staples are superior to traditional sutures in orthopaedic and other general surgeries due to their ability to close wounds faster.

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