ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 04 | April - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A COMPARISON OF SKIN STAPLES AND CONVENTIONAL SUTURING IN CLOSURE OF ABDOMINAL SKIN INCISIONS

General Surgery

Dr. A. Kishore Babu MS, Professor, Department Of General Surgery, Siddhartha Medical College, Vijayawada.

Dr. Meghavathu Govindu Naik MS, Associate Professor, Department Of General Surgery, Siddhartha Medical College, Vijayawada.

Dr. Shreyas Gadgil* Post Graduate, Department Of General Surgery, Siddhartha Medical College, Vijayawada. *Corresponding Author

Dr. Devendra G. Post Graduate, Department Of General Surgery, Siddhartha Medical College, Vijayawada.

ABSTRACT

Skin staples are being commonly used for incision wound closure worldwide, there is a need to validate their efficacy in closure and hence this study was done to compare the outcome of using conventional suturing and skin staplers for closing abdominal skin incisions. The randomised controlled study was done under the Department of General Surgery at Government General Hospital, Vijayawada over a period of 8 months. A total of 80 patients between the age of 18 and 60 years that underwent elective abdominal surgery were included and were randomly divided into two groups - suture and staples group based on the technique of wound closure used. The intraoperative time for closure in minutes was recorded. The post-operative wound assessment on 3rd and 7th post-operative day using Southampton grading was noted. On analysis, it was found that the mean time taken for closure using conventional sutures is significantly longer when compared to skin staples. There is better wound healing and a decreased incidence of wound infections in the staples group was observed. We concluded that the use of staples resulted in a substantial saving of time for wound closure and are a good are an alternative to regular suturing.

KEYWORDS

General Surgery; Infection; Post-operative; Staples; Surgical; Surgical Site Infections; Sutures

INTRODUCTION

Healing by first intention is a realistic expectation after most surgical incisions to the skin and therefore good approximation of skin edges is vital.

Although the use of traditional suturing has been around for a very long time, simple skin staples have come up as an alternative to sutures for apposing skin.[1]

As staples are being commonly used for incision wound closure, there is a need to validate their efficacy in closure. In this study, the operative time and the effect on wound healing with the use of sutures and staples was evaluated.

METHODOLOGY

This prospective study consists of 80 cases admitted under general surgery at Government General Hospital, Vijayawada during the study from November 2021 to June 2022. A total 80 cases for the purpose of the study were selected randomly to receive either staples or conventional sutures for abdominal skin wound closures. Inclusion criteria included patients between the ages of 18 and 60 years undergoing elective abdominal surgery. Patients that underwent emergency surgeries and with contaminated or dirty wounds were excluded from the study. The method used for skin closure in each case was assigned after closure of subcutaneous layer by sequence number. Ethilon 2-0 suture material with cutting needle was used for the sutures group whereas rectangular shape stainless steel staples were used for the staples group. The process of closure was timed in minutes, the length of the wound was measured intraoperatively. All patients were given emperical IV antibiotics for 5–7 days postoperatively. The post-operative wound assessment was done on 3rd and 7th post-operative day using Southampton grading. The collected data was entered in Microsoft Excel and then the results were analysed.

OBSERVATIONS AND RESULTS

The study groups included 40 patients who underwent wound closure by staples and 40 patients who underwent suturing.

Age

Mean age among suture group was 48.30 and that of stapler group was 46.47. This difference was found to be not statistically significant as p value= 0. 387. Hence, the study group was comparable in terms of age. (Table No.01)

Table No.01

	Mean Age(years)	p value
Staples Group	46.47	0.387
Suture Group	48.30	

Gender :

52 patients were male, 28 patients were female. Majority of the study population were males (65%). Two study groups were comparable in terms of gender distribution. (P value= 0.082). (Table No.2)

Table No.02

	Male	Female	p value
Staples Group	28	12	0.082
Suture Group	24	16	
Total(80)	52	28	

Mean Time of Closure :

Mean time for suture closure was 11.55 minutes with an SD of 2.48 and for staples closure was 3.38 minutes with an SD of 1.01. This difference was found to be statistically significant a P value of <0.001 (Table No.03)

Time taken for closure was nearly 4 times longer when coventional suturing was used.

Table No.03

	Mean time (minutes)	Standard Deviation
Staples Group	3.38	1.01
Sutures Group	11.55	2.48

Wound Healing And Infection :

Among the suture group 75% showed normal healing, 10% showed normal healing with mild bruising/erythema, 2.5% showed Erythema+other signs of inflammation, 5% developed hemoserous discharge and 7.5% developed pus at the suture site.

Among the stapler group 80% showed normal healing, 7.5% showed normal healing with mild bruising/erythema, 5 % showed Erythema+other signs of inflammation, 2.5% developed hemoserous discharge and 5% developed pus at the site. (Table No.04)

Table No.04

Southampton Grade	Staples Group	Sutures Group
0 - Normal healing	32	30

I - Normal healing with mild bruising or erythema	03	04
II - Erythema plus other signs of inflammation	02	01
III - Clear or haemoserous discharge	01	02
IV - Pus	02	03
V - Deep or severe wound infection	00	00
Total	40	40

DISCUSSION

In the present study, the time taken to complete wound closure was significantly less with the use of staplers as compared to sutures. The average time required to approximate skin wound was four times longer with the sutures which is consistent with other studies. In the study by Varghese et al, mean time for suture closure was 11.22 minutes and for stapler closure was 4.55 minutes.[2] In the study by Ranaboldo et al, the rate of wound closure was 8 seconds/cm with stapler and 12.7 seconds/cm with sutures.[3] Eldrup et al analyzed 137 patients and concluded that staple closure took one third of the time taken by conventional sutures.[4] In the analysis by Kathare et al, the time required to close one centimeter of wound was 11 seconds with the stapler whereas with silk suture, it was 45 seconds, more than four times longer.[5]

In the present study, normal wound healing could be achieved in both groups but higher incidence of wound infection among sutures group as compared to skin staples (20% and 30% respectively). The study conducted by Ranaboldo et al, showed no significant difference in wound infection between the two groups.[3] Smith et al in their meta analysis reported significant difference between the two closure methods with respect to wound healing.[6] Kathare et al reported 3 complications in the staple group in the form of wound infection out of 50(6%) whereas in the suture group, there were four cases with postoperative wound infection and one of which had partial wound dehiscence.[5]

However, certain literature is available that is inconsistent with the findings of this study. In the results published by Varghese et al, significantly higher incidence of wound infection among stapler group as compared to conventional sutures (30% and 11.7% respectively) was observed.[2] A study conducted by Tuuli MG et al, showed that Staple closure was associated with a two-fold higher risk of wound infection or separation compared with subcuticular suture closure.[7]

CONCLUSIONS

- Today, there are several methods available to close skin incisions instead of sutures and skin staples is emerging as a popular choice amongst them.
- When closing the abdominal skin incisions, wound infection poses a serious risk because it can have long term consequences.
- In the present study, we found that conventional sutures had a higher incidence of post-operative wound infection, and skin staplers save operative time over sutures.
- Therefore, we conclude that skin staples are an alternative to regular sutures offering the above advantages. The present study has helped to highlight the benefits of skin stapler.

REFERENCES:

1. Farquharson's Textbook of Operative General Surgery 10th Ed - CRC Press - 2015 - pg7-16
2. Varghese F, Gamalial J, Kurien JS. Skin stapler versus sutures in abdominal wound closure. Int Surg J 2017;4:3062-6.
3. Ranaboldo CJ, Rowe-Jones DC. Closure of laparotomy wounds: skin staples versus sutures. Br J Surg. 1992;79:1172-1173.
4. Eldrup J, Wied U, Anderson B. Randomised trial comparing Proximate stapler with conventional skin closure. Acta Chirurg Scand. 1981;147:501-2.
5. Kathare SS, Shinde ND. A comparative study of skin staples and conventional sutures for abdominal skin wound closures. Int Surg J 2019;6:2168-72.
6. Smith TO, Sexton D, Mann C, Donell S. Meta analysis of stapler verse sutures. BMJ.2010;340:c1199.
7. Tuuli Methodius G, Rampersad Roxane M, Carbone Jeanine F, David S, Macones George A, Odibo Anthony O. Staples Compared With Subcuticular Suture for Skin Closure After Cesarean Delivery: A Systematic Review and Meta-Analysis. Obstet Gynecol. 2011;117(3):682-90.