

Original Research Article

Sutures versus staplers for skin closure in laparotomy patients: a prospective study

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Received: 23 March 2020

Accepted: 28 April 2020

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ABSTRACT

Background: Every surgeon wants cosmetically acceptable scars along with optimal healing. Good tissue union and cosmetically acceptable scars are vital for ideal surgical practice. A basic need for skin closure is a good approximation. Apart from cosmetically good scars, it is also necessary that the skin closure technique should be technically easy, speedy, economical and acceptable.

Methods: The study was conducted on 100 patients on whom elective abdominal surgeries were performed. Patients were divided into two groups with 50 patients in each group after matching the parameters like age, co morbid conditions, using simple random sampling technique. All operations were performed by one consultant. In group A, Skin was approximated with vertical mattress sutures while in group B, staplers were used to close the wound.

Results: The age of the patients varied from 16 to 85 years. The average time taken for skin closure for suture group (A) was found to be 300sec (± 20.78) and for stapler group was found to be 120sec (± 16.50) respectively. Wound infection was found in 10 patients (20%). In stapler group 4 (8%) and in suture group 6 Patients (12%) had post-operative wound infection.

Conclusions: Cosmesis is essential and necessary in modern surgical practice. It also reflects surgical expertise.

Keywords: Scar, Staples, Sutures, Wound infection

INTRODUCTION

For the surgeon, a scar may be the only index of the surgical procedure performed, as Fitz Gibbon has stated, "By your scars you will be judged".¹ Every surgeon wants cosmetically acceptable scars along with optimal healing. Good tissue union and cosmetically acceptable scars are vital for ideal surgical practice. A basic need for skin closure is a good approximation. Apart from cosmetically good scars, it is also necessary that the skin closure technique should be technically easy, speedy, economical and acceptable. Many factors are involved in the choice of the skin closure such as surgical expertise, available materials, the type and place of the wound and patient age and health.²

Skin varies from patient to patient in texture, thickness, elasticity, the speed of healing and tendency of the scar. Today, wound closure techniques have evolved from early developments in suturing materials to advanced resources that include synthetic sutures, absorbable sutures, staplers, tapes, and adhesive compounds. The existing literature still does not provide enough evidence to say whether one of the suture material either staplers or suture is better than one another for closure of abdominal wall.³ This comparative study has been done with objective to see the merits and demerits of skin closure by stapler and suture. The comparison has been made in terms of time taken during the skin closure, pain, presence or absence of soakage, better scar and wound dehiscence.

METHODS

This prospective study was conducted in the Postgraduate Department of Obstetrics and Gynaecology, Government Medical College, Jammu over a period of one year with effect from 1st November 2016 to 31st October 2017. The study was conducted on 100 patients on whom elective abdominal surgeries was performed. Patients were divided into two groups with 50 patients in each group after matching the parameters like age, co morbid conditions, using simple random sampling technique. All operations were performed by one consultant. In group A, Skin was approximated with vertical mattress suture using non absorbable silk 2-0 at a distance of one cm from each other to close the abdominal wound while in group B, staplers were used to close the wound placed at a distance of 5 mm from one another. All patients were fully informed about the procedure and written consent was obtained. Patients' information was recorded in the proforma as per annexures containing demographic details, wound closure techniques used, time taken to close the wound, pain, cosmetic outcome of scar, minor and major complications.

Inclusion criteria

- All patients undergoing elective abdominal surgeries.
- Patient older than 18 years.
- Only vertical incision closure.
- Only laparotomy

Exclusion criteria

- Patients undergoing emergency surgeries

Each patient was given same antibiotics, Wound of every patient was assessed at fourth, eighth and one month post-operative day. Studied parameters were Age distribution, Time taken for skin closure, surgical site infection (SSI), Wound dehiscence and Pain.

Statistical analysis

Data was analyzed by SPSS software and expressed as mean±standard deviation. Chi square test was applied and p value <0.05 was considered significant.

Informed consent for the enrollment in study was taken for all the patients before the surgery.

RESULTS

Total 100 cases studied were divided into two groups each of 100 cases. Those cases whose skin was closed with suture were categorized as "Suture group" and those with stapler were categorized in "Stapler group" to compare the time taken during the skin closure, presence or absence of soakage and wound dehiscence, day of suture removal and pain during the suture removal. The

results were analyzed from the observations made as follows.

The age of the patients varied from 16 to 85 years. The mean age of the participants in the suture group and stapler group were 34.12 (±4.073) and 34.74 (±4.769) respectively. The average time taken for skin closure for suture group (A) was found to be 300sec (±20.78) and for stapler group was found to be 120sec (±16.50) respectively which was statistically significant (p<0.05).

Out of 100 patients, wound infection was found in 10 patients (20%). In stapler group 4(8%) and in suture group 6 Patients (12%) had post-operative wound infection, which was statistically significant (p-value <0.05).

In suture group A, 5 (10%) patients experienced mild postoperative pain, 30 (60%) experienced moderate pain and 15 (30%) experienced severe postoperative pain whereas in stapler group B 4 (8%) patients had mild postoperative pain, 28 (56%) experienced moderate pain, and 18 (36%) experienced severe postoperative pain. Pain perception by patients was almost similar to both methods of closure. There was no statistical significance. Pain assessment was done on first three postoperative days, and Visual analogue score (0-10) was explained to patients during pre-operative visit.

The appearance of the scar among the suture groups was good in 36 (72%), 10 (20%) had average scar, with widening or hypertrophy of the scar with itching when patients returned for follow-up at one month.

The cosmetic appearance of the scar was good in 42 (84%) of the cases in the stapler group, with 6 (12%) with average and 2 (4%) poor scars. The cosmetic appearance of the scar was also found to be statistically significant (p<0.05). Wound dehiscence was present in two patients in each group.

DISCUSSION

The principal aims of tissue repair after surgical skin incisions are rapid acquisition of strength, least tissue damage, no inflammation and an aesthetically acceptable scar. For many years, it has been possible to approximate the skin edges using sutures. Every surgeon wishes for the early healing of post-operative wound with minimal complications.

Indeed, it is the responsibility of the surgeon to choose the method of skin closure that would be suitable for the patient in terms of early wound healing without post-operative surgical site infection, cost, effectiveness, minimal pain during the suture removal and duration of hospital stay. In this study, the two groups with similar demographic characteristics are evaluated with skin closure by suture on one and stapler on other.

In this study, the mean age of the participants in the suture group and stapler group were 34.12 (± 4.073) and 34.74 (± 4.769) respectively.

Mean age of the patients varied in each study depending upon the surgeries undertaken; may be laparotomies or caesarean sections. The mean age of the participants in the suture group and stapler group were 24.12 (± 4.073) and 24.74 (± 4.769) in a study by Jahan K et al.⁴

In this study, the average time taken for skin closure for suture group (A) was found to be 300sec (± 20.78) and for stapler group was found to be 120sec (± 16.50) respectively. This results were concordant with Jahan K et al, where the average time taken for skin closure for suture group was found to be 5.46 min (± 0.97) and the same for stapler group was found to be 1.22 min (± 0.15) respectively ($p < 0.001$).⁴ Medina dos Santos et al, found in a prospective trial the mean skin closure time with stapler was 5 minutes and 25 minutes with suture.⁵ Kanagaye et al, observed that staplers were six times faster than standard sutures.⁶ Eldrup et al, concluded that staplers took one-third of the time taken by conventional sutures.⁷

In this study, out of 100 patients, wound infection was found in 10 patients (20%). In stapler group 4 (8%) and in suture group, 6 Patients (12%) had post-operative wound infection, which was statistically significant (p value < 0.05). This results were in discordance with Eldrup et a, who recorded no difference in the incidence of wound infection between stapler closure and conventional suture closure.⁷ Chunder et al, found that patients who had staples were at 6.93 times higher risk of wound infection ($p = 0.014$) than those who had sutures in the closure of caesarean section wound.⁸

In suture group A, 5 (10%) patients experienced mild postoperative pain, 30 (60%) experienced moderate pain and 15 (30%) experienced severe postoperative pain whereas in stapler group B 4 (8%) patients underwent mild postoperative pain, 28 (56%) experienced moderate pain, and 18 (36%) experienced severe postoperative pain. Similar results were obtained in a study by Rajneesh Kumar et al.⁹

In this study, the appearance of the scar among the suture groups was good in 36 (72%), 10 (20%) had average scar, with widening or hypertrophy of the scar with itching when patients returned for follow-up at one month.

The cosmetic appearance of the scar was good in 42 (84%) of the cases in the stapler group, with 6 (12%) with average and 2 (4%) poor scars. The cosmetic appearance of the scar was also found to be statistically significant ($p < 0.05$). Wound dehiscence was present in two patients in each group. Similar results were obtained by Karabhari et al.¹⁰ However, Meiring et al, showed that the cosmetic result of staples is as good as if not better than with nylon sutures. Lubowski D et al.^{11,12} compared stapled and

sutured abdominal wound closure which resulted in almost equal cosmetic scores for vertical wounds.

CONCLUSION

In modern era, cosmesis has taken a upper edge over all other factors. People are spending endlessly for this reason. A good scar is very satisfying for operating surgeon and a great relief too. So authors have to find ways of skin closure having good cosmesis, less infections, less pain and complications. This study aims to put insight into that.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sharma G, Prasher N. Sutures versus staplers for skin closure in laparotomy patients: a prospective study. *Int J Res Med Sci* 2020;8:2149-52.