

Comparison Between Continuous Vs Interrupted X-Type Suture for Midline Laparotomy Wound Closure: An Institutional Based Study

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ABSTRACT

Background: The wound is simply a disruption of the normal continuity of tissue. The present study was undertaken for comparing between continuous vs interrupted x-type suture for midline laparotomy wound closure.

Materials & Methods: A total of 40 patients schedule to undergo midline laparotomy were enrolled. Complete demographic and clinical details of all the patients were obtained. All the patients were broadly divided into two study groups as follows: Group A: 20 patients in which continuous sutures were used, and Group B: 20 patients in which interrupted x-type sutures were used. Patients were followed up and re-evaluated at 2, 4, 6 and 12 weeks after surgery in outpatient department. The patients were examined for wound infections or dehiscence. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Mean closure time was 12.3 minutes in group A and was 25.1 minutes in group B (p- value= Significant). Mean suture length was 82.3 cm in group A and was 110.7 cm in group B (p- value= Significant). Wound dehiscence was significantly higher among patients of group A in comparison to Group B.

Conclusion: Interrupted -X suture method of suturing reduces post-operative wound dehiscence, although requires more suture and consumes more time than the continuous method of suturing.


Key words: Continuous, Interrupted, Midline.

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INTRODUCTION

The wound is simply a disruption of the normal continuity of tissue. When tissue has been disrupted severely that it cannot heal naturally (without complications or possible disfiguration), it must be held in opposition until the healing process provides the wound with sufficient strength to withstand stress without mechanical support. The wound failure (dehiscence and ventral hernia) and other postoperative wound complications may result from an improper choice of suture material and improper technique. The incidence of incisional hernia varies from 9 to 19%.^{1,2}

A midline incision is very often used in abdominal surgery. It can be made rapidly, and the anatomy of the abdominal wall is such that it causes minimal damage to muscles, nerves and blood supply. Postoperative wound complications, such as surgical site infection (SSI), wound dehiscence and incisional hernia, cause patient suffering and generate costs for the welfare system.³⁻⁵ Hence; the present study was undertaken for comparing between continuous vs interrupted x-type suture for midline laparotomy wound closure.

MATERIALS & METHODS

The present study was undertaken for comparing between continuous vs interrupted x-type suture for midline laparotomy wound closure.

A total of 40 patients schedule to undergo midline laparotomy were enrolled in Department of General Surgery, Gian Sagar Medical College & Hospital, Rajpura, Patiala, Punjab, India. Complete demographic and clinical details of all the patients were obtained. All the patients were broadly divided into two study groups as follows:

Group A: 20 patients in which continuous sutures were used, and
Group B: 20 patients in which interrupted x-type sutures were used

Patients were followed up and re-evaluated at 2, 4, 6 and 12 weeks after surgery in outpatient department. The patients were examined for wound infections or dehiscence. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Table 1: Demographic data

| Variable | Group A | Group B |
|------------------|---------|---------|
| Mean age (years) | 46.5 | 44.2 |
| Males (n) | 18 | 16 |
| Females (n) | 2 | 4 |

Table 2: Diagnosis

| Diagnosis | Group A (n) | Group B (n) |
|--------------------------|-------------|-------------|
| Duodenal perforation | 9 | 10 |
| Gastric perforation | 5 | 5 |
| Appendicular perforation | 3 | 2 |
| Ileal perforation | 3 | 3 |

Table 3: Comparison of suture variables

| Suture variables | Group A | Group B | p- value |
|--------------------------------|--------------|--------------|---------------------|
| Average closure time (minutes) | 12.3 minutes | 25.1 minutes | 0.000 (Significant) |
| Mean suture length | 82.3 cm | 110.7 cm | 0.001 (Significant) |

Table 4: Complications

| Complications | Group A (n) | Group B (n) | p- value |
|------------------|-------------|-------------|---------------------|
| Wound infection | 2 | 1 | 0.323 |
| Wound dehiscence | 5 | 3 | 0.012 (Significant) |

RESULTS

Mean age of the patients of group A and group B was 46.5 years and 44.2 years respectively. Duodenal perforation is the diagnosis in 9 patients of group A and 10 patients of group B. Mean closure time was 12.3 minutes in group A and was 25.1 minutes in group B (p- value= Significant). Mean suture length was 82.3 cm in group A and was 110.7 cm in group B (p- value= Significant). Wound dehiscence was significantly higher among patients of group A in comparison to Group B.

DISCUSSION

Laparotomy wound dehiscence (LWD) is a term used to describe separation of the layers of a laparotomy wound before complete healing has taken place. Other terms used interchangeably are acute laparotomy wound failure and burst abdomen. Acute wound failure may be occult or overt, partial or complete. Overt wound failure follows early removal of sutures leading to evisceration. Occult dehiscence occurs with disruption of musculo-aponeurotic layer beneath intact skin sutures. Wound dehiscence has been noted to occur when a wound fails to gain sufficient strength to withstand stresses placed upon it. The separation may occur when overwhelming forces break sutures, when absorbable sutures dissolve too quickly or when tight sutures cut through tissues. Several patient and operative factors important for the subsequent rate of wound complications cannot be changed, for example, patient age or overweight, urgency of surgery and the degree of contamination. Some factors affecting the rate of wound complications can be totally controlled however, for example, the choice of suture material, the method of wound closure and the

quality of the suture technique.⁶⁻⁹ Hence; the present study was undertaken for comparing between continuous vs interrupted x-type suture for midline laparotomy wound closure.

In the present study, mean age of the patients of group A and group B was 46.5 years and 44.2 years respectively. Duodenal perforation is the diagnosis in 9 patients of group A and 10 patients of group B. Mean closure time was 12.3 minutes in group A and was 25.1 minutes in group B (p- value= Significant). Our results were in concordance with the results obtained by Khan AA et al who also reported similar findings. In their study, authors compared the effectiveness of continuous versus interrupted X-suturing for abdominal wall closure in patients presented with emergency midline laparotomy wound. Sample size was 100 (50 in each group). Patients in group A were subjected to continuous suturing repair while patients in group B underwent interrupted X-suturing technique. Patients from both groups were observed for 6-7 days. In post-operative period frequency of burst abdomen was assessed by consultant surgeons. Male to female distribution in group A was 41 (82%) and 9 (18%) respectively while in group B it was 42 (84%) and 8 (16%) respectively. Overall, 42 (84%) patients in group A experienced no burst abdomen as compared to 48 (96%) patients in group B within 1 week post-operatively (p=0.0455). Interrupted X-suturing technique for midline laparotomy closure in emergency cases was better than continuous closure technique because it was associated with less frequency of burst abdomen within first 1-2 weeks post-operatively.¹⁰

In the present study, mean suture length was 82.3 cm in group A and was 110.7 cm in group B (p- value= Significant). Wound

dehiscence was significantly higher among patients of group A in comparison to Group B. In a similar study conducted by Shashikala V et al, authors compared continuous sutures with x-interrupted sutures in mass closure of midline laparotomy wound in patients undergoing emergency midline laparotomy for acute peritonitis. A total of 60 patients undergoing emergency midline laparotomy for secondary peritonitis were considered for the study, 30 of whom underwent closure of abdominal wall with continuous sutures (Group A) and the other 30 with x-interrupted sutures (Group B) using non-absorbable, monofilament, polypropylene suture. The groups were comparable in means of age and sex distribution. Group A was found to have lesser time for closure of rectus, lesser suture length and lesser suture to wound length ratio when compared with Group B. Surgical site infections were similar in both groups. Patients with rectus sheath sutured in x-interrupted sutures (n=2) had significantly less wound dehiscence as compared with continuous sutures (n=8) ($p<0.05$).¹¹

CONCLUSION

From the above results, it can be concluded that interrupted -x suture method of suturing reduces post-operative wound dehiscence, although requires more suture and consumes more time than the continuous method of suturing.

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