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Original Research Article

Midline Laparotomies Closure By Means Of Small Stitches an Experience from A New Technique

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Abstract

Background: Midline line incisions are known for its versality of rapid and wide access to the peritoneal cavity with least damage to abdominal wall musculature, vessels and nerves. The closure technique varies from operating surgeon to institutions. The aim of this study was to see the postoperative results in reference to small tissue bites in the closure of abdominal wall. ***Materials and methods:*** The study was conducted in the department of general Surgery SKIMS, MCH Bemina Srinagar. A total of 50 cases were managed with small bites technique that underwent midline laparotomy in both elective and emergencies from 2016 to 2018. Patients were operated with small tissue bite sutures placed 5 - 7 mm from the wound edge and 5 - 7 mm apart and included only the aponeurosis in the stitches without peritoneum. ***Results:*** Maximum number of patients were males, maximum number of patients were in age group of 20-30 years (56%), serum albumin was ≥3 in36 (72%) of patients. Surgical site infection was seen in 12 (24%) of patients. ***Conclusion:*** Our study showed that small stitch length between 5 to 7 mm with SL: WL ratio: greater than or equivalent to 6:1 to achieve safe closure of midline laparotomy incision.

Keywords: Small bites laparotomy, suture wound length ratio.

INTRODUCTION

Midline line incision is known for its known advantages of rapid access to abdominal cavity with minimal damage to surrounding structures. These incisions are usually closed with continuous monofilament layer of suture and have high chances of complications like incisional hernia and burst abdomen [1, 2]. Jenkins was the first to describe that vertical abdominal incision closure is safe if a suture: wound length (SL: WL) ratio of more than 4:1 is achieved for wounds closed in layers [3]. The incision can be completed in seven minutes on an average [4, 5]. Wound site complications like dehiscence most commonly develops from 7 to 10 days after surgery and the duration may vary from 1 to 20 days after surgery [6]. Various factors which are responsible are patient related factors like age, body mass index, chronic illness, carcinoma, infections, raised intra abdominal pressure and surgical site factors like type of incision, surgical technique, suture material used. Keeping in view the Jenkins rule the incision should be closed with suture length (SL) to wound length (WL) of at least 4, when the ratio is less than 4 the wound site complications are three times higher [3].

MATERIAL AND METHODS

The prospective study was conducted in the department of general Surgery SKIMS, MCH Bemina Srinagar from 2016 to 2018. Patients admitted in general surgical and allied specialties' who underwent midline laparotomy in elective as well as emergency settings. A total of 50 cases were managed with small bites technique that underwent midline laparotomy. Baseline investigations of all patients including serum albumin were noted. Polypropylene suture No.1 on round body needle was used in the study to close the abdomen. We performed continuous sutures in all our patients. Patients were operated with small tissue bite sutures placed 5 - 7 mm from the wound edge and 5 - 7 mm apart and included only the aponeurosis in the stitches without peritoneum.

Inclusion Criteria

- All patients ≥ 20 years of age who undergoing abdominal surgery through midline incision in the emergency as well as in elective settings.

Exclusion Criteria

- Patients with a previous midline incision.

- Patients with hypoprotenemia, anaemia, diabetes or COPD.

RESULTS

Maximum number of patients was males, maximum number of patients was in age group of 20-30 years (56%), and only one patient was seen in the age group of 61- 70 years (2%) (Table-1). Serum albumin was ≥3 in36 (72%) of patients and < 3 in 14 patients 28(%) (Table-2). Suture length (SL) to wound length (WL) was 4:1 - <5:1 in 16 (32%) and 5:1 - 6:1in 34 (68%) of patients (Table-3). Surgical site infection was seen in 12 (24%) of patients and absent in 38 (76%) patients (Table-4).

Table-1: Showed age Distribution

Age in years	Number of patients	Percent
20-30	28	56(%)
31-40	8	16(%)
41-50	7	14(%)
51-60	6	12(%)
61-70	1	2(%)

Table-2: Showed serum albumin in the study group

Serum Albumin	Number	Percentage
<3	14	28(%)
≥3	36	72(%)

Table-3: Showed suture length (SL) with wound length (WL)

SL:WL Ratio	Number	Percentage
4:1 - <5:1	16	32(%)
5:1 - 6:1	34	68(%)

Table-4: Showed surgical site infection

Surgical site infection	Number	Percentage
Present	12	24(%)
Absent	38	76(%)

DISCUSSION

For the safe closure of abdominal wall it is recommended that it should be closed under least tension, without entangled tissue in between sutures, using monofilament suture with 1 cm bites at 1 cm apart to prevent impaired circulation with subsequent healing and increased wound complications [3]. Studies has shown that postoperative abdominal distension could increase the wound length by 30% [3].In our study, the mean age was less than the study done by Milbourn *et al.*, due to more number of peptic and duodenal perforation cases in young age group secondary to Helicobactor pylori infestation and may be due to smoking, over the counter NSAID use and stress in our setting [7]. In our study the closure took extra 5 minutes which in accordance with the previous studies, the extra time taken could be because of more close sutures taken to prevent incisional hernia [7, 8]. In The Lancet, Eva Deerenberg and colleagues' prospective, multicentre, double-blind, randomized controlled STITCH trial [9] shows that the rate of incisional hernia is lower with small tissue bites than with large bites. Studies has shown that at 1 year follow-up the occurrence of incisional hernia was signifi cantly less frequent in patients in the small bites group (35 [13%] of 268 patients) than in those in the large bites group (57 [21%] of 277 patients; covariate adjusted odds ratio 0·52, 95% CI 0·31–0·87). Postoperative pain or complications were similar between the groups [9]. In our study the mean suture length to wound length was 5.18 when it was compared with large bite groups it was found to be statistically significant. In our study mean albumin level in small tissue bites group was 3.30 when it was compared with mean albumin in large tissue bites group; there was no significant statistical difference. In our study 12 patients had surgical site infection and 3(6%) patients had wound dehiscence. In a study conducted by Khan *et al*., 28% of patients with wound dehiscence had albumin less than 3.5 g/dl [9]. When the results were compared with other studies the complications like wound dehiscence and incisional hernia were found to be lower in small tissue bites technique

CONCLUSION

Midline closure with small tissue bites and short stitch requires a median of 5 minutes extra, which in our opinion is more important to prevent the morbidity of incisional hernia and wound infection. The SL: WL ratio can be easily measured, calculated, and documented by surgical staff to achieve safe closure of midline laparotomy incision.

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