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EFFICACY OF INTERMITTENT AND CONTINUOUS ABERDEEN SUTURES FOR CLOSURE OF FASCIAL WOUNDS FOLLOWING LAPAROTOMY

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ABSTRACT

Background: Following a laparotomy, wound closure is crucial. Fascial layers play a major role in tensile strength during wound closure. Wound infection and poor healing were common post-operative problems following abdominal procedures.
Objective: To evaluate abdominal wound closure in terms of clinical results, infection, and discomfort.
Methods: Pre-rectal and per-abdominal examinations, chest X-rays, and regular blood investigations were performed on all patients undergoing laparotomies. The wounds were then closed with continuous suturing using an Aberdeen knot. After surgery, postoperative problems were assessed, and the individuals were monitored at week 1, day 15, and three and six months.

Results: Of the 90 study participants, diabetes mellitus was the most prevalent comorbidity, reported by 60% of them. Anemia, chest infections, and hypertension, on the other hand, were reported by 36%, 26%, and 12% of the participants, respectively. 10% (n=15) of the research participants experienced wound infection, which was the most frequent complication. Chronic wound discomfort was reported by 6% (n=9) of the participants, wound dehiscence by 4% (n=6), and incisional hernia by 2% (n=3) of the participants.

Conclusion: continuous suturing and the Aberdeen knot lower the incidence of infection. There are also fewer complaints of wound discomfort, stitch granuloma, suture sinus development, incisional hernia, and/or wound dehiscence, all of which indicate minor problems.

Keywords: Midline laparotomy, Aberdeen knot, abdominal wall, continuous suture, and incisional hernia

INTRODUCTION

In laparotomy wounds, wound closure is essential because the fascial layers play a large role in tensile strength throughout this process. Open abdominal surgery frequently results in incisional wounds, wound infections, and inadequate wound healing. The security of the wound closure is mostly determined by the repair of the musculofascial layer of the abdominal wall. Internal and external abdominal muscles, as well as transverse abdominal muscles with aponeurosis, make up the musculofascial layer in it. The linea alba is a midline While intermittent sutures are used by a small number of practitioners because they are thought to reduce wound pain and infection, fascia closure with an intermittent Aberdeen knot is typically part of wound closure practices. The wounds represent a discontinuity in the tissue, which must be approximated with enough strength to support proper healing. Failure to do so may lead to consequences. According to different publications, the occurrence of these wound complications varies from 9% to 19%. They can range from minor to severe and include seroma development and hernias.Two incisions: the right paramedian of the musculofascial layers, the sheath, the posterior layer of the rectus, and the anterior right subcostal incision.

While various wound closure procedures are used in everyday practice, neither a technique nor a suture material is thought to be perfect. The operating staff's preferences determine every aspect of the process and material selection. Variations in stitch intervals, distinct fascial bites, interrupted versus continuous techniques, and individual

preferences are observed in each operating person. This study assessed various methods of abdominal fascia closure for midline laparotomies, including intermittent and continuous closure utilizing the Aberdeen knot and non-absorbable polypropylene suture.3.

Aberdeen knot: a self-locking knot that secures the end of a continuous suture line by combining turns and throws. In order to make an Aberdeen knot, the first loop, sometimes referred to as one throw, is formed and goes through tissue on both sides of the incision line. The second loop then passes from the first loop. Until the desired throw numbers are being created, this process is repeated. Once the suture has passed through the last loop, one more turn (throw) is made for the knot locking. Unless requested otherwise, turns are repeated at the operating person's discretion.4

The goal of the current study was to evaluate the effects of abdominal wound closure on clinical outcomes, wound pain, and infection. Similar suture material at the same fascial closure level was employed in all study individuals to prevent the influence of the suture material.

MATERIALS AND METHODS

By employing intermittent and continuous Aberdeen sutures to close facial wounds after laparotomy, the current prospective observational clinical study aims to evaluate abdominal wound closure with respect to wound discomfort, infection, and clinical outcomes. The individuals who underwent surgery at the Institute's Department of General Surgery made up the study population.

The study's inclusion requirements included being above the age of eighteen, being male or female, agreeing to participate, having a vertical abdominal incision, and having undergone either elective or emergency surgery. people who could not give informed permission, people who were uncooperative, subjects who were medically compromised, and patients who were unsuited or contraindicated for anesthesia were the exclusion criteria for the study. All study participants gave their informed consent after being fully told about the study's design.

The participants underwent surgery after the risks and benefits were considered. Following final inclusion, a thorough history was obtained from each research participant, and the per-rectal and abdominal regions were clinically examined. A normal laboratory and blood test as well as a chest X-ray came next. Aberdeen knots and continuous sutures were used to close laparotomy wounds in every individual. Following surgery, every participant had a postoperative evaluation for potential problems such as incisional hernia, chronic wound discomfort, stitch granuloma, suture sinus development, wound dehiscence, and/or wound infection. All subjects underwent postoperative assessments at one week, fifteen days, three months, and six months.

RESULTS

The present prospective observational clinical study was conducted to assess abdominal wound closure concerning wound pain, infection, and clinical outcomes using intermittent and continuous Aberdeen sutures are used to close facial wounds during laparotomy. The study had 150 participants of both sexes, ages ranging from 18 to 76, with a mean age of 43.6±4.28 years. Table 1 contains a list of the study individuals' demographic details. The age range of the study subjects comprised the majority, with 36% (n=54) being in the age range of 21–30 years, followed by 16% (n=24) in the age group of 31–40 and 41–50 years, 14% (n=21) in the age group of 61–70 years, 8% (n=12) in the age group of 51–60 years, 6% (n=9) in the age group of <20 years, and 4% (n=6) in the age group of >70 years. In the current study, there were 28% (n=42) females and 72% (n=108) males (Table 1).

Intestinal obstruction accounted for 22% (n=33) of the reasons for abdominal surgery, followed by peptic perforation (18% (n=27), ileal perforation 12% (n=18), appendicular perforation 12% (n=18), liver abscess, and Koch's abdomen 6% (n=9) of the subjects each, incisional hernia 4% (n=6) of the study subjects, and pancreas pseudocyst, descending colon carcinoma, gastric outlet obstruction, carcinoma stomach, superior mesenteric artery (SMA) thrombosis, obstructed inguinal hernia, rectal prolapse, and abdominal trauma 2% (n=3) of the study subjects each, as indicated in Table 2.

Once the comorbid conditions of the study subjects were evaluated, Table 3 shows that diabetes mellitus was the most common comorbidity, reported by 60% (n=90) of the study subjects, followed by anemia (36%; n=54), chest infections (26%; n=39), and hypertension (12%; n= 18).

Out of the study subjects, the most frequent post-surgical complications were wound infection, which affected 10% (n=15). Chronic wound pain was observed in 6% (n=9) of the subjects, wound dehiscence in 4% (n=6), and incisional hernia in 2% (n=3) of the subjects. As demonstrated in Table 4, none of the study's subjects experienced stitch granuloma or suture sinus development.

DISCUSSION

The bulk of study participants in this study were between the ages of 21 and 30, comprising 36% (n=54) of the sample, followed by 16% (n=24) of the sample in the age groups of 31-40 and 41-50 years, 14% (n=21) of the

sample in the age group of 61-70 years, 8% (n=12) of the sample in the age group of 51-60 years, 6% (n=9) of the sample in the age group of <20 years, and 4% (n=6) of the subjects in the age range of >70 years.

There were 72% (n=108) males and 28% (n=42) females in the present study. The reason for abdominal surgery was intestinal obstruction in 22% (n=33) study subjects followed by peptic perforation in 18% (n=27) study subjects, ileal perforation in 12% (n=18) subjects, appendicular perforation in 12% (n=18) subjects, liver abscess, and Koch's abdomen in 6% (n=9) subjects each, incisional hernia in 4% (n=6) study subjects, and pancreas pseudocyst, descending colon carcinoma, gastric outlet obstruction, carcinoma stomach, superior mesenteric artery (SMA) thrombosis, obstructed inguinal hernia, rectal prolapse, and abdominal trauma in 2% (n=3) subjects each. These demographic and disease characteristics were comparable to the studies of Vipul G et al[5] in 2014 and Khan MI et al[6] in 2017 where authors assessed subjects with comparable demographics and reasons for surgery were also similar.

In terms of the comorbidities among the research participants, diabetes mellitus was the most prevalent, occurring in 60% (n=90) of the individuals. Anemia was reported in 36% (n=54), chest infections in 26% (n=39), and hypertension in 12% (n=18) of the participants. The outcomes aligned with the research conducted by Kiran K. Singisetti et al. (2009) and Zabd-Ur-Rehman AR et al. (2013), which noted comparable comorbidities among patients following laparotomy.

When the study subjects' post-surgical complications were assessed, wound infection was the most common complication, occurring in 10% (n=15) of the subjects. Chronic wound pain was observed in 6% (n=9) of the subjects, wound dehiscence in 4% (n=6) of the subjects, and incisional hernia in 2% (n=3) of the subjects. None of the study's subjects exhibited stitch granuloma or suture sinus development. The results aligned with the research conducted by Kreszinger M et al. (2007) and Rajesh KB et al. (2019), whose authors documented comparable postoperative problems to those observed in this investigation.

CONCLUSION

The present study concludes that infection incidence is reduced with continuous suturing and Aberdeen knot with lesser reports of wound pain, stitch granuloma, suture sinus formation, incisional hernia, and/or wound dehiscence showing minimal complications. However, the present study had a few limitations including small sample size, short monitoring time, and geographical area biases. Hence, more longitudinal studies with larger sample size and longer monitoring period will help reach a definitive conclusion.

REFERENCES

1. O'Dwyer PJ, Courtney CA.Educational Review: factors involved in abdominal wall closure and subsequent incisional hernia. Surg J R Coll Surg EdinbIrel 2003;4:17–22.
2. Khan NA, Almas D, Shehzad K, Chaudhry AK, Mian MA. Comparison between delayed-absorbable polydioxanone and non-absorbable (Prolene) suture material in abdominal wound closure. Pak Armed Forces Med 2009;23:123-6.
3. Mimi, Leong, Linda G. Philips. Wound Healing. Chapter 8 in Sabiston's Textbook of Surgery, 17th ed, 183-207.
4. Hodgson NCF, Malthaner RA, Ostbye T. The search for an ideal method of abdominal fascial closure. Ann Surg 2000;231:436– 42.
5. Vipul G, Halvadia BM, Bharaney RP, Vicky A, Shah SM, Samir R, et al. Study of Two Techniques for Midline Laparotomy Fascial Wound Closure. Indian J Surg 2014;76:91–4.
6. Khan MI, Khalil J, Khan MA. Internal tension sutures, a novel method of midline laparotomy closure in high-risk patients. Pak J Surg 2017; 33:165-9.
7. Kiran K Singisetti, George P Ashcroft. Aberdeen 'continuous interrupted' surgical suturing technique. Ann R Coll Surg Engl 2009; 91:344–50.
8. Zabd-Ur-Rehman AR, Naveed M, Javeed MU, Akbar A. Comparison of Wound Dehiscence in Interrupted with Continuous Closure of Laparotomy. PJMHS 2013;7:828.
9. Kreszinger M, Delimar D, Kos J, Jovanov N, Vnuk D, Maticic D, et al. Wound strength after midline laparotomy: a comparison of four closure techniques in rats. Vet Arhiv 2007;77:397–408
10. Rajesh KB, Tarun M, Rajeev S, Sanjay G, Simrandeep S, Kumar A, Ashok KA, Comparative study of abdominal wound dehiscence in continuous versus interrupted fascial closure after emergency midline laparotomy. Int Surg J 2019;6:886-91.

TABLES

S. No	Characteristics	Percentage (%)	Number (n)
1.	**Mean age (years)**	43.6±4.28	
2.	**Age range (years)**		
a)	<20	6	9
b)	21-30	36	54
c)	31-40	16	24
d)	41-50	16	24
e)	51-60	8	12
f)	61-70	14	21
g)	>70	4	6
3.	**Gender**		
a)	Males	72	108
b)	Females	28	42

Table 1: Demographic characteristics of the study subjects

S. No	Diagnosis	Percentage (%)	Number (n)
1.	**Abdominal trauma**	2	3
2.	**Rectal Prolapse**	2	3
3.	**Obstructed Inguinal hernia**	2	3
4.	**SMA Thrombosis**	2	3
5.	**Carcinoma stomach**	2	3
6.	**Gastric outlet obstruction**	2	3
7.	**Descending colon carcinoma**	2	3
8.	**Pancreas pseudocyst**	2	3
9.	**Incisional hernia**	4	6
10.	**Koch's abdomen**	6	9
11.	**Liver abscess**	6	9
12.	**Appendicular perforation**	12	18
13.	**Ileal perforation**	16	24
14.	**Peptic perforation**	18	27
15.	**Intestinal obstruction**	22	33

Table 2: Diagnosis for surgery in the study subjects

S. No	Comorbidities	Percentage (%)	Number (n)
1.	**Hypertension**	12	18
2.	**Anemia**	36	54
3.	**Diabetes mellitus**	60	90
4.	**Chest infection**	26	39

Table 3: Comorbidities reported in the study subjects

S. No	Complications	Percentage (%)	Number (n)
1.	**Wound Infection**	10	15
2.	**Wound dehiscence**	4	6
3.	**Chronic wound pain**	6	9
4.	**Incisional hernia**	2	3
5.	**Suture sinus formation and Stitch granuloma**	0	0

Table 3: Complications seen in the study subjects