(e) ISSN Online: 2321-9599
(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

Assessment of Effect of Stitch Length in Postoperative Wound Infection- A Clinical Study

Manjush Kumar Srivastava[1], Ashwani Kumar Pandey[2]

[1]Assistant Professor, [2]Associate Professor, Department of Surgery, Mayo Institute of Medical Sciences Barabanki, U.P.

ABSTRACT:
Background: There are different types of incisions. Midline incision is also known as laparotomy incision. The present study was conducted to determine the effect of stitch length on wound complication. **Materials & Methods:** The present study was conducted on 40 patients who were admitted in the department for surgery. In all patients, midline incion was given. Patients were divided into 2 groups based on size of stitch length. They were either in small stitch length or in large stitch length group. In cases of small stitch length, stitches were placed 5- 8mm away from wound edge and in cases of large stitch length, stitches were placed 10 mm away from wound edge. In groups, complication such as surgical site infection (SSI), seroma, incisional hernia and wound dehiscence was recorded.
Results: Age group 20-3 0 years had 2 patients in group I and 8 in group II, 30-40 years had 5 in group I and 2 in group II, 40-50 years had 8 in group I and 3 in group II and >50 years had 5 in group I and 7 in group II. The difference was significant (P< 0.05). Group I had SSI in 5%, seroma in 2%, incisional hernia in 4.6% and wound dehiscence in 2% cases and in group II, SSI in 12%, seroma in 4%, incisional hernia in 6.9% and wound dehiscence in 5% cases. The difference was significant (P< 0.05). **Conclusion:** Stitch length of smaller size may be useful in reducing complications. Wound infection is frequently encountered complication. Among all, SSI and wound dehiscence is common one.
Key words: Incisional hernia Stitch length, Wound

Corresponding Author: Dr. Ashwani Kumar Pandey, Associate Professor, Department of Surgery, Mayo Institute of Medical Sciences Barabanki, U.P., India

This article may be cited as: Srivastava MK, Pandey AK. Assessment of Effect of Stitch Length in Postoperative Wound Infection- A Clinical Study. J Adv Med Dent Scie Res 2016;4(3):138-140.

INTRODUCTION

Incisions play an important role in any kind of surgery. Surgical incision is a cut through skin for doing operation. Ideally, the incision should be sharp and short to prevent post operative complication and pain. There are different types of incisions. Midline incision is also known as laparotomy incision. It is a vertical incision which follows the linea alba. It is further divided into upper midline incision and lower midline incision.[1]

Other incisions are median sternotomy for cardiac procedures. Thoracotomy is used for separation of ribs from chest. Subclavicular, tracheotomy, clamshell incision etc. are few more incisions. After performing procedure, incisions are closed with different suture materials. The wound infection is frequent of complication resulting from various factors such as type of suture material used, care of wound etc. Wound complications such as wound dehiscence, surgical site infection and incisional hernia are quite common.[2] There should be suture length (SL) to wound length (WL) ratio of at least 4 especially in case of midline incision. It should be a running suture. When the SL to WL ratio is less than 4, the risk of herniation is 3 times higher. The ratio (the length of the suture used through the length of the wound) depends on the size of each stitch and the stitch interval. Therefore for prevention of wound infection, SL to WL should be atleast 4.[3]

Studies have suggested that many small stitches should be placed at close intervals. This can be obtained by incorporating a larger amount of tissue into stitches placed at greater intervals. Large stitches are usually suggested because studies have shown that stitches placed at least 10 mm from the wound edge produce a stronger wound.[4,5] The present study was conducted to determine the effect of stitch length on wound complication.

MATERIALS & METHODS

The present study was conducted in the department of general surgery. It comprised of 40 patients who were admitted in the department for surgery. In all patients, midline incision was given. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups based on size of stitch length. They were either in small stitch length or in large stitch length group. A continuous, single-layer monofilament suture closed the incision, and self-locking anchor knots were used. Loop Ethilon was the material used for wound closure. In cases of small stitch length, stitches were placed 5- 8mm away from wound edge and in cases of large stitch length, stitches were placed 10 mm away from wound edge. In both groups, complication such as surgical site infection (SSI), seroma, incisional hernia and wound dehiscence was recorded. Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

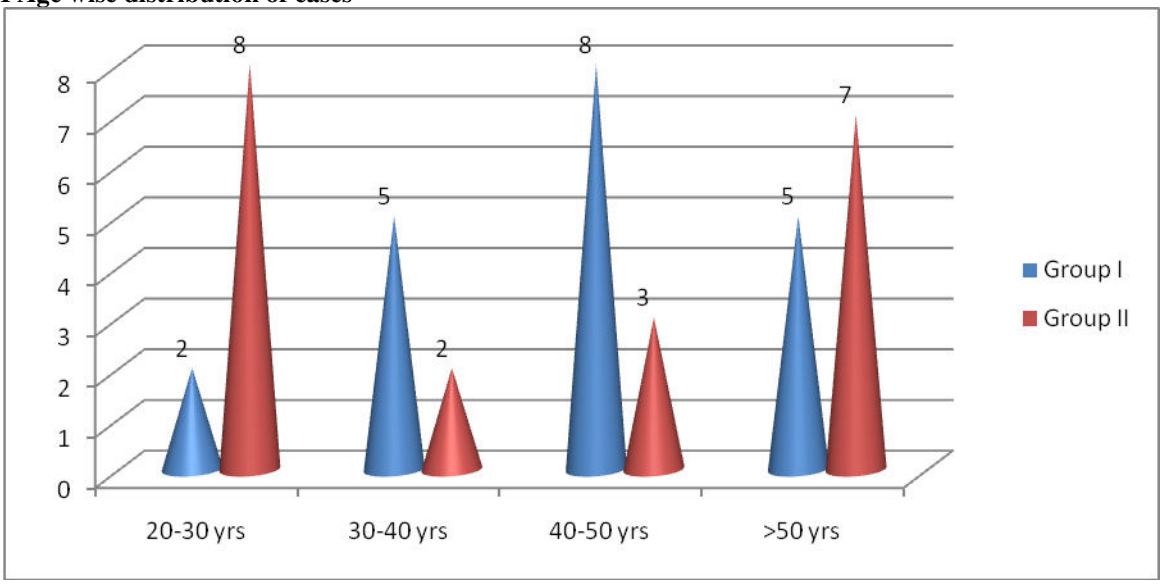
RESULTS

Table I Distribution of patients

Total- 40				
Group I (small stitch)		Group II (Large stitch)		P value
Male	Female	Male	Female	
10	10	10	10	1

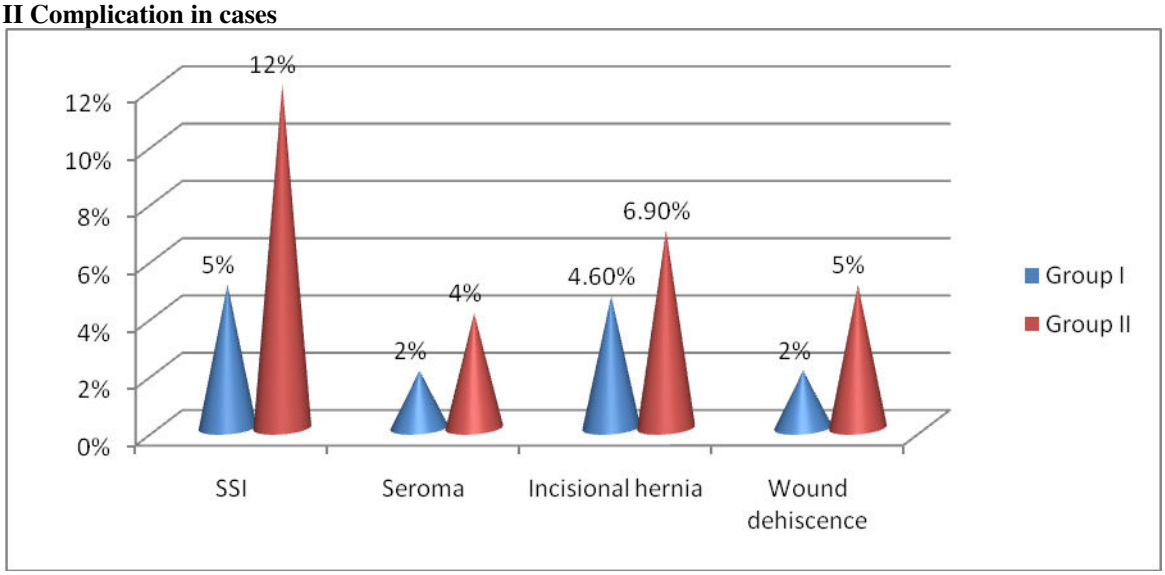
Table I shows that both groups had equal number of males (10) and females (10). The difference was non- significant (P-1).

Graph I Age wise distribution of cases



Graph I shows that age group 20-3 0 years had 2 patients in group I and 8 in group II, 30-40 years had 5 in group I and 2 in group II, 40-50 years had 8 in group I and 3 in group II and >50 years had 5 in group I and 7 in group II. The difference was significant (P< 0.05).

Graph II Complication in cases



Graph II shows that group I had SSI in 5%, seroma in 2%, incisional hernia in 4.6% and wound dehiscence in 2% cases and in group II, SSI in 12%, seroma in 4%, incisional hernia in 6.9% and wound dehiscence in 5% cases. The difference was significant (P< 0.05).

DISCUSSION

1% of the world population is suffering from chronic wounds. The major shortcoming is that it generally takes longer time to heal and care is enormously variable, as is the time to heal. There are approximately 4.5 million pressure ulcers in the world that require treatment every year. Other incisions are chevron incision which is made on the abdomen below the rib cage.[6] The cut starts under the mid-axillary line below the ribs on the right side of the abdomen and continues all the way across the abdomen to the opposite mid-axillary line thereby the whole width of the abdomen is cut to provide access to the liver. In case of trauma surgery, a single incision extending from xiphoid process to pubic symphysis is given in cases of midline incision.[7] The present study was conducted to determine the effect of stitch length on wound complication.

In present study, 40 patients of both genders were divided into 2 groups. Group I were those in which small stitches were given and group I were those in which large stitches were given. In present study, both groups had equal number of males (10) and females (10). In present study we found that age group 20-3 0 years had 2 patients in group I and 8 in group II, 30-40 years had 5 in group I and 2 in group II, 40-50 years had 8 in group I and 3 in group II and >50 years had 5 in group I and 7 in group II. This is similar to Gain et al.[8]

We found that there were complications in both types of stitches. The common complication was SSI, wound dehiscence, seroma and incisional hernia. Wound dehiscence is rupture of skin along the line of incision. It is frequently observed complication. It results in severe pain, inflammation, bleeding and fever. Incisional hernia results from incompletely healed wound. Patient experiences bulge or protrusion at the site of incision. We found that group I had SSI in 5%, seroma in 2%, incisional hernia in 4.6% and wound dehiscence in 2% cases and in group II, SSI in 12%, seroma in 4%, incisional hernia in 6.9% and wound dehiscence in 5% cases. This is similar to Adesh et al.[9]

In a study by Danel et al[10], 381 patients received long stitch length stitches and 356 received short stitch length. Wound dehiscence occurred in 1 patient whose wound was closed with a long stitch length. Surgical site infection occurred in 35 of 343 patients (10.2%) in the long stitch group and in 17 of 326 (5.2%) in the short stitch group . Incisional hernia was present in 49 of 272 patients (18.0%) in the long stitch group and in 14 of 250 (5.6%) in the short stitch group. In multivariate analysis, a long stitch length was an independent risk factor for both surgical site infection and incisional hernia.

Cengiz et al[11], in their study of effect of stitch length on the rate of postoperative wound complications in midline incisions found that there was mean 78.68% for vacuum assisted closure (VAC) group and mean 51.92% for conventional moist dressing. VAC group had less number of hospital stay as compared to conventional moist dressing group. There was mean 80.78% of graft uptake in VAC group and mean 59.58% in conventional moist dressing group.

CONCLUSION

Wound infection is frequently encountered complication. Among all, SSI and wound dehiscence is common one. Stitch length of smaller size may be useful in reducing complications.

REFERENCES

1. Leaper DJ, van Goor H, Reilly J, et al. Surgical site infection—a European perspective of incidence and economic burden. Int Wound J. 2004;1(4):247-273.
2. Israelsson LA, Wimo A. Cost minimisation analysis of change in closure technique of midline incisions. Eur J Surg. 2000; 8: 642-646.
3. Bucknall TE, Cox PJ, Ellis H. Burst abdomen and incisional hernia: a prospective study of 1129 major laparotomies. Br Med J 1982; 28:931-933.
4. Wissing J, van Vroonhoven TJ, Schattenkerk ME, Veen HF, Ponsen RJ, Jeekel J. Fascia closure after midline laparotomy: results of a randomized trial. Br J Surg. 1987; 74(8):738-741.
5. Israelsson LA, Jonsson T. Closure of midline laparotomy incisions with polydioxanone and nylon: the importance of suture technique. Br J Surg. 1994; 81 (11):1606-1608.
6. Jenkins TP. The burst abdominal wound: amechanical approach. Br J Surg. 1976; 63(11):873 876.
7. Sanders RJ, DiClementi D, Ireland K. Principles of abdominal wound closure, I: animal studies. Arch Surg. 1977;112(10):1184-1187.
8. Gain, Y, Blomquist P, Israelsson LA. Small tissue bites and wound strength: an experimental study. Arch Surg. 2001;3: 272-275.
9. Adesh, Pollock AV, Greenall MJ, Evans M. Single-layer mass closure of major laparotomies by continuous suturing. J R Soc Med. 1979;72(12):889-893.
10. Denal, Millbourn D, Israelsson LA. Wound complications and stitch length. Hernia. 2004; 8(1):39-41.
11. Cengiz Y, Gislason H, Svanes K, Israelsson LA. Effect of stitch length on the rate of postoperative wound complications in midline incisions. Eur J Surg. 2001; 167(1):60-63.

Source of support: Nil **Conflict of interest:** None declared