ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 06 | June - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PROGRESSING CAREFUL RESULTS: INVESTIGATING THE CONTINUOUS DOUBLE LOOP CLOSURE IN MIDLINE LAPAROTOMY WOUNDS

General Surgery

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ABSTRACT

Objective: The motivation behind this study is to examine the viability of persistent twofold circle conclusion of midline laparotomy wounds and how it forestalls and diminishes wound disease and wound dehiscence. **Methods:** A prospective study of 100 who underwent laparotomy through midline incision in Zydus hospital Dahod over a period of one and half years. One suturing technique is continuous double loop closure, while the other is continuous mass closure. This study compares the differences between the two suturing techniques used to close midline laparotomy wounds. **Results:** Comparing continuous double loop closures with the control group, we found that wound infection was less with continuous double loop closures. We also found that wound dehiscence was less with continuous double loop closures. There is no risk of burst abdomen with continuous double loop closure. **Conclusion:** The continuous double loop closure technique for midline laparotomy wounds is one of superior method as it prevent wound infection and wound dehiscence and also prevent burst abdomen. In high-risk and emergency laparotomy cases, this technique is recommended to close midline laparotomy wounds.

KEYWORDS

Continuous double loop closure, laparotomy, wound dehiscence.

INTRODUCTION

Closure of abdominal wound during surgery should be a routine procedure. Laparotomy wound dehiscence is a term used to describe separation of of layers of wound before complete healing. It is also called as Burst Abdomen. Laparotomy wound dehiscence is still a puzzle for most surgeons. A surgeon had closed so many laparotomy wounds during his career but the problem of a wound dehiscence after laparotomy remains challenging. Therefore, there is continuous research to eliminate this complication. Increasing the strength of suture material could prevent wound communication. Studies have shown that using sutures with higher breaking strength along with proper wound closure technique can reduce the risk of wound dehiscence. Additionally, using topical antibiotics and antiseptic agents can reduce the risk of infection and improve wound healing. Patients undergoing emergency laparotomy suffer from comorbid condition. In old age patients more prone for wound related complication. There are so many techniques and suture material for closure of Abdominal wound are available. In contrast, continuous double loop closures have been shown to give good strength and have a lower incidence of wound dehiscence and wound infections when compared to single loop closures.

METHOD

This study was conducted on 100 patients who underwent laparotomy through midline incision in the Department of surgery, Zydus Hospital Dahod from April 2019 to April 2021.

Patients for study were selected from those attending the surgical emergency with suspicious of acute abdomen requiring emergency laparotomy.

Inclusion Criteria

- Patients aged between 18 years to 80 years required emergency laparotomy both male and female.
- Patients underwent surgery with midline incision.

Exclusion Criteria

- Patients who died within 10 days after surgery.
- Patients who underwent surgery by para midline incision or other incision.
- Patients who underwent Re exploratory laparotomy.
- We divided this study in two group. Each group have 50 patients.
- Group A which include 50 patients in which sheath closed by continuous double loop manner.
- Group B which include 50 patients in which sheath closed by another suture material either vicryl or prolene.

Operative Technique

After Resuscitation and preparation patients were taken for emergency exploratory laparotomy. In supine position, parts painted and draped. Midline incision kept and abdomen opened in layers. The pathology like perforation, obstruction, solid organ injury was dealt followed by through peritoneal lavage was given. Abdominal drain placed. Closure was done by either continuous double loop closure or by another method as per group allocation.

Technique Of Closure

In Group A Rectus sheath was closed using double loop ethylene. Each bite was taken 1 cm from the Linea alba edge and successive bites being 1 cm from each other. The edge of Linea alba was gently approximated without strangulation. Wound washed with betadine and saline .skin closed with polyamide 2-0. Sutures were then placed to secure the Rectus sheath, ensuring that the tissue was held in appropriate alignment without tension.

Post-operative Evaluation

All patients were Examined daily for General condition and postoperative complications, Drain Output, Abdominal distension, serosanguinous discharge, Wound gaping, Wound dehiscence. All patients were kept nill per oral and on parental fluids till their bowel recovered. Broad spectrum antibiotics were given as per protocol and were changed according to culture and sensitivity. Daily dressing of the wound was done using betadine solution. In patients who had no wound infection, any gaping or wound dehiscence skin sutures were removed after two weeks.

Follow Up

Regular follow up was done up to 6 th- 10 th postoperative days at hospital and then up to week during the follow up all patients were examined for Abdominal distension, wound gaping, complete wound dehiscence and burst abdomen as well as for incisional hernia .

RESULTS

Table 1. Gender Distribution:

	Group A (CDLC)	Group B (Control)	Total
Male	32 (64%)	36 (72%)	68 (68%)
Female	18 (36%)	14 (28%)	32 (32%)
Total	50	50	100

Table 2. Type Of Surgery

	Group A (CDLC)	Group B (Control)
Emergency surgery	32 (64%)	33 (66%)
Elective surgery	18 (36%)	17 (34%)
Total	50	50

Table 3. Clinical Comorbidities

	Anaemia	Acute Renal failure	COPD	Diabetes & Hypertension
Group A	19 (38%)	26 (52%)	18 (36%)	11 (22%)
Group B	25 (25%)	21 (42%)	22 (44%)	14 (28%)
Total	44	47	40	25

Table 3. Type Of Incision

	Group A (CDLC)	Group B (Control)	Total
Upper Midline	12 (24%)	13 (26%)	25
Mid midline	30 (60%)	31 (62%)	61
Lower Midline	8 (16%)	6 (12%)	14
Total	50	50	100

Table 4. Rate Of Wound Infection

	Group A (CDLC)	Group B (Control)	Total
Wound Infection	24 (48%)	29 (58%)	53

Table 5. Rate Of Wound Dehiscenes

	Group A (CDLC)	Group B (Control)	Total
Wound Dehiscence	6 (12%)	23 (46%)	24

Table 6. Rate Of Burst Abdomen

	Group A(CDLC)	Group B(Control)	Total
Burst abdomen	1 (2%)	8 (16%)	9

RESULT

In this study There are Total 68 are male patient and 32 female patients. Laparotomy commonly done in male patients. Total 65 cases are done for Emergency surgery while 35 cases are electively operated. Most of patients taken for surgery having multiple Comorbidities. Including both Group, Anemia seen in 44 cases, Acute Renal failure and high creatinine seen in 47 cases, COPD present in 40 cases, Diabetes mellitus and Hypertension present in 25 cases. Preferred incision for Laparotomy is midline incision.61 cases having midline incision, 25 cases Upper Midline incision while 14 cases having lower midline incision. Wound infection is common in both Group. In Group A (CDLC) 24 cases (48%) having wound infection while in Group B 29 cases (58%) having wound infection. So wound infection is commonly seen in emergency laparotomy because of severe sepsis. Wound dehiscence seen in 6 cases (12%) in Group A (CDLC) While in Group B 23 cases (46%) having wound dehiscence. Burst abdomen seen 8 cases(16%) of Group B while in Group A only 1 case (2%) having burst abdomen. So though wound infection is common in both Group wound dehiscence and Burst abdomen less seen in Group A (CDLC).

CONCLUSION

Despite increased knowledge of wound healing and advance in suture material and wound care the Incidence of wound dehiscence doesn't decline. The length of suture material and its ratio to length of wound is important in reducing the incidence of wound dehiscence. In classical continues mass closure the stitch interval is less than 1 cm and width of tissue bite is less was 1 cm. In the post operative period on Abdominal incision may lengthen by 30% if Abdomen was distended.so the stitch interval elongates in step with the incision and when combined with small tissue bite these sutures may strangulate the wound edge and cause necrosis.so there is increased tendency for the suture to cut through the tissue. In CDLC the width of tissue bite was more than 2 cm. Although incidence of wound disruption is more frequently occur in older age patients other risk factor should be considered. Dehiscence occur in 5 out of 50 cases of emergency operation and 1 Elective case. This is confirmed by current reports which regard emergency operation to be risk factor for development of dehiscence. This may be related to the hemodynamic instability of the patients and to the unscheduled operations. The associated medical illness ranges from 40% to 50% in both Group. Main medical illness was Anemia and Acute Renal failure due to sepsis. The infection rate was 48% in Group A CDLC. Out of which 12 % shows wound dehiscence while in control group rate of wound infection is 58% out of which 46 % develop wound dehiscence. The infection may be the cause of dehiscence in which the fascia has disintegrated by necrotizing infection. The infection could be due to operation on immunocompromised patients with different medical illness and infection occur more in emergency operation. The decreased rate of infection in the CDLC group may be due to the configuration of the suture material which allow the use of thread with elasticity without compromising wound approximation, the outer loop pulls the inner loop tightly if the tensile force on the wound increases. Thus keeping the edge of the wound approximated and decreasing the chances of strangulation. Burst abdomen occur in 5 -10 % of Abdominal operation with mortality of 50%.In our study burst abdomen occur in 1 case in CDLC And 8 case in control group. The decrease in dehiscence in the CDLC group may be attributed to that the greater tissue strength is obtained by taking a wide bite of the tissue and to the total amount of the tissue encircled by the double loop suture, which is at least twice that encompassed by continuous mass closure. This reduced the force per unit area and reduced the fascial disruption and led to increased strength of sutured wound. Also when the tensile force on the wound increased the outer loop which contain more tissue than the inner loop pulled the inner loop tight which result in perfect apposite of the wound edges instead of divergence as in the case with control group. Lastly our study shows that the CDLC technique is superior to other closure technique in dealing with midline laparotomy wounds and recommended in high risk patients.

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