ISSN 2321 – 7359 EISSN 2321 – 7367

discovery

Medical Science

The International Weekly Journal for Medicine

Post-operative complications after mass closure of abdomen- a study of 150 patients: a case study

Mohd Kaleemuddin[1]☼, Nageeruddin Shaik[2], Chandramala[3], Asim uddin Ansari[4], Syed Salman Ahmed[5]

1. Associate professor, Department of General Surgery, Shadan Institute of Medical Sciences and Research Centre, Hyderabad 500008, A.P., India
2. Final year post graduate, Department of General Surgery, Shadan Institute of Medical Sciences and Research Centre , Hyderabad 500008 , A.P., India
3. Professor and H.O.D, Department of General Surgery, Shadan Institute of Medical Sciences and Research Centre , Hyderabad 500008 , A.P., India
4. Junior Resident, noble hospital, A.P., India
5. Junior Resident, Shadan Institute of Medical Sciences and Research Centre, Hyderabad 500008, A.P., India

☼**Corresponding author:** Mohd Kaleemuddin, Associate professor, Department of General Surgery, Shadan Institute of Medical Sciences and Research Centre, Hyderabad 500008, A.P., India: E-mail: drkaleemuddinansari@gmail.com

Publication History
Received: 21 November 2013
Accepted: 22 January 2014
Published: 12 February 2014

Citation
Mohd Kaleemuddin, Nageeruddin Shaik, Chandramala, Asim uddin Ansari, Syed Salman Ahmed. Post-operative complications after mass closure of abdomen- a study of 150 patients: a case study. *Medical Science*, 2014, 5(16), 29-32

ABSTRACT

The objective of the study is to study post-operative complications after one layer closure of abdomen. This is a retrospective study in the Department of General Surgery, Shadan Institute of Medical Sciences and Research Centre, Hyderabad, from December 2010 to December 2013. Patients above the age of 10 years, of both the sexes requiring laparotomy in emergency or elective were studied and followed. In this study of 150 cases of laparotomy with upper and lower midline and subcostal incisions were closed with mass closure technique using no 1 prolene and no 1 vicryl. Continuous suturing was done to close linea alba and muscles. The post-operative complications like burst abdomen, incisional hernia, wound infection, wound dehiscence, pain abdomen, re-exploration, keloid formation, hypertrophied scar, stitch granuloma, fecal fistula were studied. Mass closure of the abdomen with non-absorbale suture material seems to be a better technique because the wound can be closed rapidly, conveniently, and if required re-exploration becomes easier, and the post-operative complications are minimum compared to the multilayered closure of abdomen compared with standard studies.

Keywords: Mass closure, Single layer closure, Post-operative complications.

1. INTRODUCTION

Exploration and re-exploration of the abdomen is a common occurence in surgical practice. While performing laparotomy, the surgeon should keep in mind that the incision chosen should have good accessibility, extensibility,

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security and an acceptable scar with minimum post-operative complications. Factors other than mechanical ones like obesity, recurrent surgery, infected wound, uraemia, renal failure, sepsis, jaundice should alert the surgeon to be meticulous (Stanley et al. 1951). The standard practice of closure of laparotomy wounds was a multi-layered closure with chromic catgut has compelled the surgeon to go for non-absorbable sutures. The incidence of dehiscence rapidly decreased from 1941, Jones et al. used mass closure with figure of 8 with stainless steel wire stitches. A single layer closure of abdominal wound with non- absorbable suture was advised by John .H. Shephard (John H Shephard, 1983). Over the years, the method of mass closure with non-absorbable suture material has gained popularity because of minimum discomfort, good patient compliance and the low rate of complications. Mass closure permits easy closure of abdominal wound even in the presence of distension. It is safer in debilitated patients, since the tissues will not hold any suture unless one takes the advantage of bulk (Sharma et al. 1986).

2. MATERIAL AND METHODS

The present study was conducted in the Department of General Surgery, Shadan Institute of Medical Sciences and Research Centre, Hyderabad, between December 2010 to December 2013. A total of 150 patients above the age group of 10 years, of both the sexes requiring laparotomy in emergency or electively were studied including gyaenocological cases. The aim of the study was to know the incidence of immediate and late post operative complications of mass closure of abdomen like the incidence of incisional hernia, wound infection, fecal fistula hypertrophied scar, stitch granuloma, keloid, intestinal obstruction, pain abdomen or death.

3. TECHNIQUE

In all the cases, abdominal wound was closed in one layer (mass closure) with no 1 prolene and no 1 vicryl. In all the cases, sutures were continuous and every third suture was locked and in those cases where prolene was used, the first and the last knots were buried. The bites were taken at a distance of 2-2.5cms from the wound margin and a distance of about 1-1.5cms in between the sutures was maintained. The sutures were kept just firm. The peritoneum was closed along with linea alba. No separate sutures were taken. The length of the suture to the wound length was maintained in a proportion of 2:1 to 3:1 (kendall et al. 1991). The types of incisions in the study were upper, lower midline and right subcostal incision. The transverse and para-medial incisions were excluded from the study. Sutures were removed on 10^{th} to 12^{th} post operative day and the patients were followed up for a varying period, twice monthly basis for the first 3 months and 2 monthly basis thereafter for a maximum period of 2 years. The patients were evaluated for immediate and late post-operative complications.

4. RESULT AND ANALYSIS

No of cases- 150 (Table 1 to 4)
Laparatomy- midline incision for emergency and elective-77
Cholecystectomy- right subcostal incision- 72
Gynaecological emergencies (ectopic) - lower midline incision-1
Percentage of complications: (22%)
Incisional hernia- 6.6%
Wound infection with gaping followed by secondary suturing- 10%
Hypertrophied scar- 3.3%
Keloid-2%
Burst abdomen- Nil
Re-exploration- Nil
Stitch granuloma- Nil
Fecal fistula – Nil

Patients died- 1 (53 year old lady with intestinal obstruction and an old case of incisional hernia. Laparotomy was done, multiple resections and anastomoses were done in the small bowel and a segment of about 60 cms of intestine was resected. Patient was alright up to 10^{th} post operative day and suddenly she developed chest pain and died because of massive myocardial infarction).

5. DISCUSSION

In a study of 150 cases of laparotomy with 78 midline and 72 right subcostal incisions. Patients were observed and followed up from December 2010 to December 2013 for a maximum period of 3 yrs at shadan institute of medical sciences and research centre. In our study of mass closure of abdominal wound with non absorbable and delayed absorbable suture material, we have observed this technique was easier and fast with short duration of anaesthesia

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Table 1
Incisional Hernia (10 patients)

S. No	Patient Name	Risk Factors	Age/Sex	Date of surgery	Disease	Procedure
1	Chithi Babu	Anaemia Jaundice	26/M	10-04-2010	haemorrhagic pancreatitis	Laparotomy
2	Shankariah	Malignancy Jaundice COPD	75/M	25-05-2010	Obstructive Jaundice(Ca pancreas)	Laparotomy
3	Fareed	Peritonitis	20/M	08-02-2012	Intestinal obstruction	Choledochojejunostomy
4	Mumtaz Begum	Obesity Multiple Adhesions Weak abdominal wall	40/F	10-02-2012	Recurrent Incisional Hernia	Hernial repair
5	Laxman	Anaemia Hypoproteinemia Alcoholic Jaundice	58/M	26-11-2012	Chronic Pancreatitis	Laparotomy (cystogastrostomy)
6	Srinivas	Septicemia Fecal peritonitis Anaemia with COPD	65/M	21-04-2013	Acute appendicitis with peritonitis	Laparotomy + colonic resection
7	Chandrashekar	Malnutrition Anaemia	42/M	15-05-2013	Hiatus hernia	Fundoplication + Gastrojejunostomy
8	M.D. Khan	Peritonitis Diabetes mellitus Ischemic heart disease	56/M	06-07-2013	Perforation with peritonitis	Exploratory Laparotomy
9	Anil	Fever with cough Peritonitis	14/M	19-09-2013	Intestinal obstruction (sub umbilical mass)	Exploratory Laparotomy
10	Yousuf	Fecal peritonitis Poor general condition Septicemia	25/M	25-10-2013	Appendicitis with perforation and fecal peritonitis	Laparotomy

Table 2
Wound Infection (15 patients)

S. No	Patient Name	Risk Factors	Age/ sex	Date of surgery	Disease	Procedure
1	Anjamma	Peritonitis Anaemia Diabetes mellitus	45/F	22-06-2011	Peritonitis	Laparotomy
2	Abida Begum	Anaemia Hypoproteinemia	45/F	27-08-2011	Transverse colonic mass	Laparotomy
3	Abdul Khader	Malnutrition Anaemia	35/M	07-11-2011	Bilious gastritis + hiatus hernia	Laparotomy
4	Bheemla	Peritonitis	65/M	15-11-2011	Subacute intestinal obstruction	Laparotomy
5	Md. Sultan	Chemical peritonitis Jaundice	30/M	27-12-2011	Duodenal Perforation + Subacute intestinal obstruction	Laparotomy
6	Tasleem Begum	Anaemia	25/F	11-01-2012	Adenoma of right lobe of liver	Laparotomy (exploration and liver resection)
7	Fareed	Jaundice Pancreatitis	20/M	08-02-2012	Intestinal obstruction	Choledochojejunostomy
8	Chandramma	Anaemia Diabetes mellitus	70/F	05-06-2012	Cholecystitis	Cholecystectomy
9	Swathi	Anaemia	38/F	23-06-2012	Intestinal obstruction	Laparotomy
10	Sk. Azeem	COPD Anaemia	70/M	31-01-2013	Perforated appendix	Laparotomy
11	Chandrashekar	Anaemia Hypoproteinemia	42/M	15-05-2013	Hiatus hernia	Gastrojejunostomy + fundoplication
12	Venkatiah	Infected wound peritonitis	40/M	11-06-2013	Stab injury	Exploratory laparotomy
13	Anil	Umbilical discharge Infected wound	14/M	19-09-2013	Intestinal obstruction (Sub umbilical mass)	Exploratory Laparotomy
14	Yousuf	Peritonitis	25/M	25-10-2013	Appendicitis with fecal peritonitis	Laparotomy
15	Affan khan	Chronic malaria	16/M	04-11-2013	Splenomegaly	Splenectomy

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Table 3
Hypertrophied Scar (5 patients)

S.No	Patient name	Age/ Sex	Date of Surgery	Disease	Procedure
1	Haneefa Begum	40/F	02-12-2010	Cholecystitis	Cholecystectomy
2	Ramlamma	68/F	12-07-2012	Cholecystitis	Cholecystectomy
3	Venkatamma	25/F	17-10-2012	Splenomegaly	Splenectomy
4	Naseema	45/F	31-08-2013	Intestinal obstruction	Exploratory laparotomy
5	Mastan wali	40/M	07-09-2013	Ileocaecal tuberculosis	Resection and anastomosis

Table 4
KELOID (3 patients)

S.No	Patient name	Age/ Sex	Date of surgery	Disease	Procedure
1	Kaneeza zahera	45/F	11-05-2010	Cholecystitis	Cholecystectomy
2	Fatima begum	22/F	16-01-2012	Cholecystitis	Cholecystectomy
3	Manohar	30/M	14-05-2012	Chronic duodenal ulcer)	Gastrojejunostomy

and operating time with decreased incidence of complications even in emergency and elective cases (Pollock, 1979; Ellis, 1965 & 1985; Herman et al. 1974; Donaldson Hal, 1982; Jenkins, 1976).
In our study of 150 cases we had incidence of 6.6 (10 patients) percent of incisional hernia of total cases.
Surgical wound infection with gaping of the skin was seen in 10 (15 patients) percent of the cases.
Hypertrophied scar and keloids were seen in 3.3 percent and 2 percent respectively.
One patient died of myocardial infarction on 10th post op day.
No cases of burst abdomen were observed in our study.
Other complications of surgery like fecal fistula, stitch granuloma and reexploration were not noted.

6. CONCLUSION

Mass closure of abdominal incision with non absorbable (prolene) and delayed absorbable (vicryl) suture material;

1. Abdominal wall can be closed easily and rapidly as the peritoneum is not closed separately, even when the contents are under tension. Closure is very secure even in debilitated and cachexic patients.
2. Mass closure gives a better acceptable scar with minimum complications and also saves the time,lessens duration of anaesthesia especially in severely ill patients
3. If second laparotomy is necessary shortly after the first one, wound can be rapidly opened
4. It is associated with a lower incidence of wound infection, burst abdomen and incisional hernia, than with layered closure of abdomen
5. In mass closure of a deep bite of tissues is taken which provides more cushioning effect and hence, less strangulation of tissues.
6. Mass closure is a better technique is better in old age group
7. Mass closure then holds the promise for a safe technique of closure and minimal complications, its gaining wider acceptance and is definitely a better technique

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