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Continuous Versus Interrupted Sutures in Laparotomy Closure: A Comparative Study

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ABSTRACT

Objective:

• To compare the two different techniques of mass closure of abdomen namely, continuous and interrupted methods by various means

• Formulating guidelines for proper selection of closure method in given patient

• Comparing two techniques for post-operative pain and patient acceptability

• To demonstrate the prevalence of post-operative complications;

• Wound sepsis

• Persistent wound pain

• Wound dehiscence

• Incisional hernia

Method:

• Study area The PROSPECTIVE study was conducted at NEW CIVIL HOSPITAL, B.J. MEDICAL COLLEGE, SURGERY department. Hospital receives patients mainly from the municipal hospitals and from other referral hospitals across the Gujarat and neighbouring states namely Rajasthan and Madhya Pradesh. Other patients are self-referable.

• Inclusion criteria: Patients undergoing midline laparotomy for emergency or planned surgeries in general surgery during the study period consenting to participate in the study were included.

Results:

Out of 50 patients undergone midline laparotomy 78% were male and 22% were female. Majority patient were from middle age group 31-45 (%). Most common cause for midline laparotomy being perforation peritonitis (48%). Rate of wound infection was greater (52%) in continuous closure than in interrupted closure (20%). Incidence of post-operative wound dehiscence is also more in continuous closure (32%) than in interrupted closure (12%). Occurrence of post-operative incisional hernia is far more in continuous closure (36%) than in interrupted closure (8%).

Conclusion:

With this study we have found that interrupted method in midline laparotomy closure in emergency or planned surgeries is more beneficial in terms of complications like wound sepsis, wound dehiscence and incisional hernia.

KEYWORDS

Introduction

Abdominal incisions can be divided into four main anatomic categories.

1.Vertical: Vertical incisions may be midline or paramedian. They may be supraumbilical or infraumbilical and can be extended superiorly or inferiorly in either direction. For optimal exposure of the entire abdominal cavity, as in the case of abdominal trauma, a midline vertical incision can be taken superiorly to the xiphoid process and inferiorly to the symphysis pubis.

2.Transverse and oblique: These incisions can be placed in any of the four quadrants of the abdomen. Common incisions include the Kocher subcostal incision for biliary surgery, the Pfannenstiel infraumbilical incision for gynaecologic surgery, the McBurney incision for appendicectomy, and the transverse or oblique lateral incision for exposure of the colon.

3.Abdominothoracic: This incision provides superior exposure of the upper abdominal organs by joining the peritoneal cavity, pleural space and mediastinum into a single operative field. It is particularly useful for extensive exposure of the liver and esophagogastric junction.

4.Retroperitoneal and extraperitoneal: These incisions are ideal for surgery of the kidney, adrenal gland, aorta and for renal transplantation.

Median laparotomy is the most common technique of abdominal incisions because it is simple, provides adequate exposure to all four quadrants, is rapid to open and usually blood sparing. Another commonly used approach is the paramedian one. A major problem after laparotomy remains the adequate technique of abdominal fascia closure. In prospective studies the incidence of incisional hernias varies from 9% to 20%. Wound infection, obesity and suture closure technique are addressed as major risk factors for the development of an incisional hernia and burst abdomen.

Whereas patient related factors such as age, gender, body mass index (BMI), underlying disease, co-morbidities, prior surgical procedures and life-style factors (e. g. smoking) cannot be controlled or standardised, the decisive chance to lower the incidence of incisional hernias is to optimise the surgical technique. Therefore, a great variety of suture materials and needles has been developed to provide an adequate closure of the fascia and thus the abdominal wall. Thousands of patients have been included in trials in order to answer the question which is the optimal method in abdominal fascia closure and today a number of reviews and a meta-analysis are available. However, the reliability of the existing evidence is compro-

mised by the low number of relevant randomised controlled trials (RCT's).

Post operative wound complications include:
1.Surgical site infections(SSI)
2. Necrotising wound infections
3. Gas gangrene
4. Necrotising fasciitis
5. Stitch abscess
6. Hematoma
7. Wound dehiscence
8. Incisional hernia

Therefore the discussion regarding the optimal technique of abdominal fascia closure continues and most surgeons practice according to their own experience rather than acting evidence-based. This attitude resulted in an unchanged frequency of incisional hernias over the last decades.

Here we tried to define some guidelines to choose proper abdominal closure method using various parameters.

Study
The prospective study was conducted at NEW CIVIL HOSPITAL, B.J. MEDICAL COLLEGE, AHMEDABAD, General Surgery department including 50 cases undergoing midline laparotomy for emergency and elective surgeries.Hospital receives patients mainly from the municipal hospitals and from other referral hospitals across the Gujarat, self-referred and neighbouring states namely Rajasthan and Madhya Pradesh.

All the patients undergoing midline laparotomy in general surgery during the study period of 1 year (July 2014-july 2015) consenting to participate in the study were included.

Age equal or greater than 13 years
Expected survival time more than 12 months.

Results
Table 1: age

Age in year	Number of patients	Percentage
13-30	4	8%
31-45	26	52%
46-60	11	22%
61-75	7	14%
>75	2	4%
Total	50	100%

Majority of the study participants were in the age group 31 – 45 constituting 52%.

Table 2: distribution according to sex

Sex	Patients	percentage
Male	39	78%
Female	11	22%
Total	50	100%

In our study group no. of male patients were more as compared to no. of females. This may be due to smoking, alcohol, road traffic accident more prevelent in male population.

Table 3: presenting complaints

Cause	Patients	Percentage
Perforation peritonitis	24	48%
Acute intestinal obstruction	12	24%
Blunt trauma abdomen	4	8%
Planned surgeries	10	20%
Total	50	100%

Table 4: wound infection

Closure method	Total no. of patients	No. of patients developed wound infection	Percentage
Interrupted	25	5	20%
Continuous	25	13	52%

In our study 5 out of 25 patients (20%) whose fascial closure was performed using interrupted method develop wound infection as opposed to 13 patient out of 25 patient (52%) who were repaired using continuous method. Prevalence was higher in continuous than in interrupted group .

Table 5: wound dehiscence

Closure method	Total no. of patients	No. of patients developed wound dehiscence	Percentage
Interrupted	25	3	12%
Continuous	25	8	32%

In our study, 3 patient out of 25 developed wound dehiscence with interrupted group, as compare to 8 patient out of 25 developed wound dehiscence with continuous group.

Table 6: incisional hernia

Closure method	Total no. of patients	No. of patients developed incisional hernia	Percentage
Interrupted	25	2	8%
Continuous	25	9	36%

In our study, 2 patient out of 25 developed incisional hernia with interrupted group, as compare to 9 patient out of 25 developed incisional hernia with continuous group.

Table 7:post-operative pain

Closure method	Total no. of patients	No. of patients developing post-operative pain	Percentage
Interrupted	25	4	16%
Continuous	25	4	16%

In our study, no difference was found in incidence of post-operative pain between these two closure methods.

Conclusion
This was a prospective study of 50 cases operated by midline laparotomy , performed in the Surgery Department of Civil Hospital, Ahmedabad during the period 2014– 2015
In our study, we tried to compare two different closure method that is continuous and interrupted in many perspectives like patient acceptability, early complications like wound sepsis, wound dehiscence, and late complication like post-operative pain, incisional hernia.
Incidence of midline laparotomy is more common in middle aged (31-45) male patient.
Most common cause of laparotomy is gastrointestinal perforation peritonitis.
Wound sepsis found to be more common with continuous method than interrupted method.
Incidence of wound dehiscence is less with interrupted method than continuous one.
There is no difference found in term of post-operative pain with both method.
Incidence of incisional hernia was more following continu ous method than interrupted method. However long term follow up is crucial for patients who undergo midline lapa rotomy to assess the occurrence of incisional hernia.

Summary
With this study we have found that interrupted closure in midline laparotomy is more beneficial in terms of complications like wound sepsis, wound dehiscence and incisional hernia.