



RESEARCH ARTICLE

COMPARATIVE STUDY BETWEEN MASS CLOSURE (SINGLE LAYER) VS LAYER WISE CLOSURE OF MIDLINE INCISIONS

*Dr. Ankur Akela and Dr. Runni Kumari

Patna Medical College, Patna

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ABSTRACT

Background: In abdominal surgery correct method of closing wounds is of great importance. The ideal method should be technically simple so that the results are as good in the hands of trainee as in those of master surgeons. Until recently layered closure of the abdominal wounds was considered ideal with great emphasis placed on peritoneal layer. It is now fully realized both from clinical observation and animal studies, that healing of incisions takes place by dense fibrous scar that unites the opposing faces of laparotomy wound enmasse. **Objective:** To compare the outcome of mass closure Vs single layer closure of midline incisions. **Methods:** 50 patients with midline abdominal incisions operated in PMCH, Patna either in emergency or elective were selected and divided in to two groups. GROUP1 included patients where single layer closure done on the other hand GROUP2 included patients for whom layer wise closure was done. The outcomes in terms of wound infection, wound dehiscence, sinus formation, incisional hernia etc. Were compared. **Results:** About 1.8% developed wound dehiscence in group1 compared to 7.1 % in group 2. Other complications like suture sinus formation, scar complications, Incisional hernia, were more common in group2 compared to group1. **Conclusion:** single layer closure method holds the promise for a safe technique of closure with minimal complication.

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INTRODUCTION

In abdominal surgery, wisely chosen incision, correct method of making and closing laparotomy wounds are of great importance. The ideal method of abdominal wound closure should be technically so simple that the results are as good in the hands of trainee as in those of master surgeons. It should be free from the complications like burst abdomen, incisional hernia persistent sinuses and should be comfortable to the patient and should leave a reasonably aesthetic. The aims & objective of wound closure is to provide adequate tensile strength, approximation of tissues to allow healing, to secure wound edges when infected.

Mass closure technique of midline incisions consists of suturing of the cut edges of peritoneum and linea alba together, care is taken to take wide bites of the cut edges at least 1cm from the edge of incision and continuous locking sutures taken using polypropylene No.1. The skin is sutured using interrupted Nylon.

In layered closure technique the peritoneum is closed with chromic catgut No.1-0 by continuous interlocking sutures.

The linea alba is closed similarly with polypropylene No.1 by continuous interlocking sutures followed by skin closure using interrupted Nylon. In our study we have made an attempt to compare both the closure techniques in Indian setup.

Aims and Objectives

The aim of this study is to compare mass closure and layered closure techniques with respect to:

- Rate of complications like burst abdomen, incisional hernia and sinus formation.
- Duration, easiness and cost effectivity.
- Aesthetic scar.
- Patient compliance.

MATERIALS AND METHODS

The present study is a prospective study conducted on patients in the department of surgery, Patna Medical College &

Hospital, Patna, Bihar. We included 50 patients with midline abdominal surgery either elective or emergency. All patients included in the study had their incisions closed by either single layer or by conventional technique of layered closure. Detailed history taking was followed in all cases and particulars notes were made of regarding the diseases like hypertension diabetes, jaundice, TB. Thorough clinical examination of the patients was made and recorded, particular attention was given to anaemia, nutritional status.

Investigations: Routine blood investigations (CBC, Blood grouping & Rh typing, S. Creatinine, B.Urea, S. Electrolytes, BT, CT, ESR, Liver function test). Routine urine & stool examination. Radiological examinations like Xray-abdomen, Xray-chest, USG abdomen done wherever necessary. Complete workup was done in all elective cases but for emergency cases only the investigations necessary for diagnosis were done.

The positive criteria for different factors are:-Anaemia (Hb<10gm%), Jaundice (Bilirubin>2mg/dl), Diabetes (FBS>120mg/dl), Obesity(BMI>30) Malnutrition (BMI<20), Uremia (S.Urea>40mg/dl, S.Creatinine>1.4mg/dl).

Based on technique of closure all 50 patients were divided into 2 groups.

- **Group 1** included patients where single layer closure done on the other hand
- **Group 2** included patients for whom layer wise closure was done.

Postoperative Period

The patients were observed postoperatively till all the abdominal sutures were removed and the patient discharged from hospital. The post-op complications like vomiting, chest infection, abdominal distension, suture sinus formation wound infections or wound dehiscence were noted. All patients received antibiotics parenterally till drains were removed usually for 6-7 days followed by oral antibiotics for 5-6 days more. Wounds were examined on 5th, 7th, 9th, 11th day and sutures were usually removed on 10th to 12th post-op days followed by total removal on 13-14th post-op day. After the patients were discharged from the hospital, regular monthly follow-up was done for first 3 months, once in 3 months for next 1 year regarding wound pain, suture sinus formation, scar complication incisional hernia.

RESULTS

A comparative study of 50 cases divided in to two groups (single layer-23 cases vs layer wise closure-27 cases) was undertaken to compare the type of closure and its complications. The mean time consumed for single layer closure (group 1) was 20.18 minute whereas for layer wise closure (group 2) was 33.42 minutes (group1 takes an average 13 minutes less than other). Mean duration of hospital stay was 16 days for group1 and 18 days for group2. On follow-up it was found:

- **Wound infection:** Group1-out of 15 cases done in emergency 2 developed wound infection, whereas out of 8 cases done in elective 1 developed wound infection. In Group2 out of 15 cases done in emergency 4 developed wound infections whereas 2 cases out of 12 done in elective developed wound infections.
- **Wound dehiscence-**It has incidence of 1.8% in group1 while for group2 it was 7.1%.
- **Incisional hernia-**In Group 1, 1 out of 23 patients (4.1%) developed incisional hernia while in Group 2, 2 out of 27 (7.1%) patients developed it.
- **Scar complication-**In single layer closure 2 patients out of 23 patients developed scar complication (pain over scar, hypertrophy of scar) whereas in layer wise closure 4 patients developed it.
- **Suture sinus formation-**In group1, 1 out of 23 (4.1%) cases developed it whereas it was 2 out of 27 for group2 (7.1%).

Conclusion

In conclusion single layer closure had the advantages over conventional layer wise closure in terms of reduced time for closure, incidence of wound infections, wound dehiscence, suture sinus formation and incidence of incisional hernia. Thus, single layer closure method holds the promise for a safe technique of closure with minimal complication.

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