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A COMPARATIVE STUDY OF SINGLE LAYER CLOSURE VS CONVENTIONAL LAYER CLOSURE OF LAPAROTOMY WOUNDS

General Surgery

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KEYWORDS

BACKGROUND

Exploration and re-exploration (Laparotomy) is one of the most common surgeries performed in an emergency as well as elective setting. Incision and suturing of the abdominal layers are the commonest exercises in operative surgery. While performing laparatomies, surgeons should keep in mind that the incision chosen should have good accessibility, extensibility, security and a resultant acceptable scar.

Abdominal closure is very important and incision, technique of repair and use of newer suture material has created great interest to surgeons. Different suture techniques are used for closure of laparotomy wounds and each has its strong proponents. Ideal method of abdominal wound closure is modified frequently. Commonly followed methods of abdominal closure are conventional layered closure and single layer closure

Factors other than mechanical ones are also known to predispose to poor wound healing. Thus, obesity renal failure, jaundice and sepsis should alert the surgeon to use meticulous technique.

The standard practice of closure of laparatomy wounds was or, is a multilayer closure with chromic catgut and a recent technique of figure of eight technique with mass closure with steel wire (Jones et al.) stitches and more recent mass closure with monofilament prolene.

Over the years the method of mono layer closure using non absorbable sutures has been gaining popularity. Minimum discomfort, good patient compliance, the low rate of complications and reliability of this method of closure confirm the merits of monolayer closure technique of laparotomy incisions.

Aims and Objectives

My objective is to study 100 cases of laparotomy, dividing them into two groups of 50 each. Patients of one group will undergo closure of the laparotomy wound by conventional method and the other group will undergo closure in a single layer.

The objectives being to:

- Compare the operative time and healing time for single layer closure and conventional layered closure of laparotomy wounds.
- Compare the post-operative complications of laparotomy wounds like seroma, wound infection, wound gaping, burst abdomen and incisional hernia in the two groups.
- Incisions taken.

MATERIALS AND METHODS

100 patients admitted in the Department of General Surgery, narayana medical college, nellore, will be included in the study. The patients are chosen randomly, irrespective of gender, age and nature of disease.

Out of these 100 patients, 50 will be randomized to have the abdominal wall closed by single layer closure technique and remaining 50 by conventional layered closure and they will be grouped as group 1 and group 2 respectively

Inclusion Criteria

- Patients aged 15-75 years.
- Patients posted for laparotomy, either elective or emergency.
- Patients who underwent surgery with midline and paramedian incisions.

Exclusion Criteria

- Patients with co-morbid conditions like diabetes mellitus, immuno-compromised patients, patients on cancer chemotherapy, immunotherapy and on long term steroids.
- Patients who died within 7 days after surgery.
- Patients who underwent surgery by Grid-iron and Transverse abdominal incisions. Patients who underwent second laparotomy or re-laparotomy.

Observations

The present study is aimed at comparing the techniques of laparotomy wound closure which in a very common practice in the surgical practice. The study had two groups of 50 each of the total hundred cases we intended to study about the closure of laparotomy wounds.

DISCUSSION

The present study is aimed at comparing the techniques of laparotomy wound closure which in a very common practice in the surgical practice. The study had two groups of 50 each of the total hundred cases we intended to study about the closure of laparotomy wounds.

The technique of laparotomy wound closure is one of most the important factors in preventing post operative complications of surgical wound and the most important factor in the long-term behavior of the wound inflicted on the patient by the surgeon. Any error, error of judgement, such as a poorly placed incision on the abdomen, unsatisfactory method of closure of the incised laparotomy wound or inappropriate selection of the suture material can lead to complications of the surgical wound including hematoma, stitch abscess, infection, wound dehiscence or evisceration, incisional hernia or an unsightly scar.

Time consumed in single layer closure was much lesser than time consumed in conventional layer closure there by proving that single layer closure is a superior technique in decreasing the time to which a patient is subjected to both surgical and anaesthetic stress and thereby decreasing morbidity of the patient and also mortality. Meticulously closed single layer closure is a superior surgical closure compared to conventional closure. Time factor is one of the good indicators to use single layer closure over conventional layer closure

Seroma is a simple surgical complication to occur, but it has a big affect on the outcome on a long-term basis as it would increase the chances of wound infection if not identified at the earliest not properly taken care off. In the present study. seroma was found to be particularly high in both the groups and most of the surgical wounds that had wound infection. Seroma is a simple surgical factor, if taken care of decreases other complications of surgical wound. And the present study clearly shows that single layer closure has less chances of developing seroma compared to the conventional layer closure. This is another reason to adopt single layer closure.

Burst abdomen and incisional hernia are other serious complications of abdominal surgical wounds. Our study had relatively very low cases of burst abdomen and incisional hernias, allinall only four of them and conventional layer closure had more cases-3 of them and only one case of burst abdomen had occurred in the single layer closure. Care must be

taken to prevent both these complications of abdominal surgical wounds because in both these cases patient has to be subjected to both anaesthetic and surgical stress and these both factors play a major role in deciding, how effective closure a surgeon has done. Meticulous closure can prevent these complications.

In the present study, it is established that single layer closure is superior to conventional layer closure even though our study is a short period study.Hence, the actual outcome of surgical wound could not really be established because incisional hernias occur after a period of 5 to 10 years and not within the first year as once thought to be. Hence, the present study has that short coming.

Though single layer abdominal closure is a popular technique in abdominal closure, there are still many surgeons who close the abdomen in conventional closure and find it good enough for long term outcome.It's difficult to say but meticulous closure of abdomen will prevent long term complications surgical abdominal wounds.

Statistical Analysis

In our study, 17 cases underwent emergency surgery and 33 cases underwent elective surgery in group 1(single layer closure). In group 2 (conventional layer closure), 18 cases underwent emergency and 32 cases underwent elective surgery.

Mode of Delivery

Mode of delivery	Single layer closure No	Single layer closure %	Conventional layer closure No	Conventional layer closure %
Emergency	17	34	18	36
Elective	33	66	32	64
Total	50	100	50	100

RESULTS

Type of Incision

Incision	Single layer No	Single layer %	Conventional layer No	Conventional layer %
Left paramedian incision	1	2	1	2
Left subcostal incision	2	4	2	4
Midline incision	34	68	34	68
Right kocher's incision	10	20	9	18
Right paramedian incision	3	6	4	8
Total	50	100	50	100

Material Used

Materials used	Single layer closure no	Single layer closure %	Conventional closure no	Conventional closure %
Prolene	50	100	0	0
Prolene and vicryl	0	0	50	100
Total	50	100	50	100

Time Taken For Closure

Time taken for closure	Single layer closure no	Single layer closure %	Conventional closure no	Conventional closure %
<30 mins	50	100	17	34
>30 mins	0	0	33	64
Total	50	100	50	100

In this comparative study of 100 patients group 1 patients have less complicates than group 2 , such as seroma is seen in 22 patients in group 1 where as 35 patients in group 2, wound infection is seen in 10 patients in group 1 where as 26 in group 2, wound gaping is seen in 10 patients in group 1 where as 16 in group 2, burst abdomenis seen in only one in group 1 where as 02 in group 2, incisional hernia is seen in only one patient in group 2.

CONCLUSIONS

Various methods of skin closure for laparotomy wounds have occupied the attention of surgeons over the years.Success of a surgery is complete when the wound heals with minimal complications and its cosmetic appearance is satisfactory. This is seen being possible with single layer closure technique of laparotomy wounds because of the shorter time required and other favourable factors for its healing. For a long time laparotomy wounds were closed in layers. When the mass closure technique of laparotomy wound was introduced, the myth of layered closure was broken. In our study, single layer closure of laparotomy wounds took less operative time than conventional layered closure thus reducing the risk of anaesthetic hazards and the intra operative time.

In our study conducted in the rural setup, most of our patients were under nourished and had one or more associated factors which had an implication on the overall healing of the wound and hence a relative increase in the postoperative complications. The incidence of postoperative complications like seroma, wound infection, wound gaping, burst abdomen and incisional hernia were however less in single layer closure compared to conventional layered closure. Hence, we conclude that single layer closure is a better technique for closure of laparotomy wounds than conventional layered closure in terms of operative time and post operative complications. However, longer study period is required to know the exact incidence of incisional hernias in the comparison group.

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