



A COMPARATIVE CROSS- SECTIONAL STUDY BETWEEN THE USE OF VERTICAL AND HORIZONTAL SKIN INCISIONS DURING UMBILICAL AND PARAUMBILICAL HERNIA REPAIR IN A TERTIARY CARE HOSPITAL

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ABSTRACT

One of the most underrated aspects of surgical procedure is the very placement of skin incisions. Several factors influence the post-operative morbidity, outcome and satisfaction of a patient. One such being the very placement of a skin incision by the surgeon. Even though the trend nowadays is to opt for laparoscopic and mini-incision surgery, the first and basic rule in surgery is to have an incision that will be comfortable for the surgeon and provide adequate access to the area of pathology. The purpose of this study is to compare vertical and horizontal skin incisions during umbilical and paraumbilical hernia repair that makes the surgical technique and post-operative outcome much more favorable. In this study, we compare the intraoperative difficulty, post operative wound healing and morbidity between these two techniques.

KEYWORDS : Skin incision, umbilical hernia, paraumbilical hernia

INTRODUCTION:

Umbilical hernias occur when the umbilical scar fails to close completely in the child or incompletely closes and stretches in an adult. Umbilical hernias are classified into three types, namely, congenital, infantile, and adult types. Vertical incisions are made in the anterior midline of the abdomen extending a short span of about 2 to 3 cms above and below the umbilicus curving to one side near the umbilicus. Horizontal incisions will be made in a smiley fashion about 2 to 3 cms below the umbilicus and the ends of the smiley incision will be further extended horizontally if required.

OBJECTIVES: To do a comparative study between the use of vertical and horizontal skin incisions during elective open onlay mesh repair of umbilical and paraumbilical hernias thereby reaching the following objectives,

- 1) To compare the surgical wound healing in each group.
- 2) To compare the technical aspects faced by the operating surgeon during surgery, which includes ease of hernial sac dissection, raising skin flaps and duration of the surgery.
- 3) To compare the post-operative morbidity in terms of number of days of hospital stay after surgery.

METHODS: This is an interventional study done during the period from November 2019 to October 2020. It is conducted among patients of more than 18 years of age who presented with umbilical/paraumbilical hernia to the OPD, The Department of General Surgery, Govt. Stanley Hospital, Chennai and are willing for surgical intervention.

INCLUSION CRITERIA:

- Patient Age > 18 years
- Patients who are willing to participate in the study.
- All patients diagnosed with umbilical/paraumbilical hernia and willing for surgical intervention

EXCLUSION CRITERIA:

- Patients with ventral hernias presenting as acute emergencies.
- Patient with recurrent/incisional hernia.
- Patients with associated comorbidities

OBSERVATION AND RESULTS: A total of 60 patients who were diagnosed with umbilical/paraumbilical hernia were operated during the study period.

1: ANALYSIS OF THE SURGEON'S NUMERICAL RATING SCORE

The difficulties faced by the surgeon during dissection being a qualitative data numerical rating score was used to quantify the same. The duration of surgery is decided as quick or lengthy based on the surgeon's own experience and no value is set for each.

Following table shows the average surgeon's score in group A and group B in each defect size categories.

Table 1:

DEFECT SIZE	SURGEON'S SCORE IN GROUP A	SURGEON'S SCORE IN GROUP B
1cm	1.6	1.67
1.5cm	2.67	3
2cm	3.5	3.67
2.5cm	3.67	4
3cm	3	4.5
3.5	4	4.4
4	4.2	4.5
4.5	4	5.5
AVERAGE	3.26	3.73

Average score among GROUP A – 3.26.

Average score among GROUP B – 3.73.

From the average scores it is apparent that there is only a minor difference in the average scores in both groups. However, upon clumping the samples into two groups based on whether they are less than 2.75cm or more than 2.75cms, we get the following data,

Table 2:

DEFECT SIZE	GROUP A – SURGEON'S SCORE	GROUP B – SURGEON'S SCORE
<2.75CM	2.73	2.87
>2.75CM	3.80	4.60

Table 3:

DEFECT SIZE	RESULT OF TEST OF SIGNIFICANCE (Unpaired students T test)
<2.75CM	The t-value is 0.33806 The p-value is .737838 The result is not significant at p < .05
>2.75CM	The t-value is 2.5923 The p-value is .014983. The result is significant at p < .05

From the table, it can be seen that in patients with defect size less than 2.75cms, no statistically significant difference exists between group A and group B.

It can also be noted that for patients with defect size more than 2.75cm, there does exist a statistically significant difference between group A and group B.

2: ANALYSIS OF POST OPERATIVE WOUND DEHISCENCE IN BOTH GROUPS

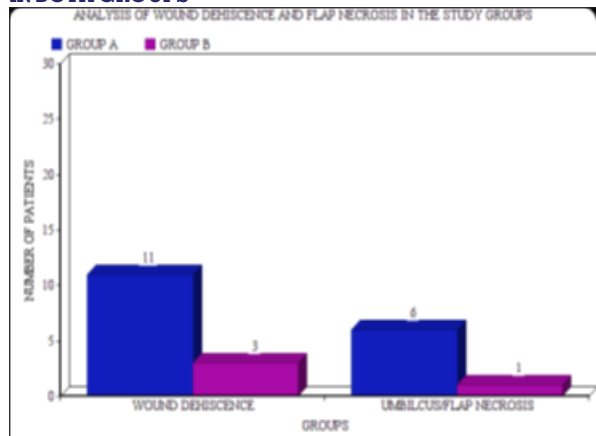


FIGURE 1

There exists a statistically significant difference in the occurrence of wound dehiscence between group A and group B.

3: Analysis Of Post Operative Skin Flap/ Umbilical Necrosis Between group A And Group B

Table 4:

NECROSIS PRESENT	NECROSIS ABSENT	TOTAL
GROUP A	6(20%)	24
GROUP B	1(3.3%)	29
TOTAL	7	53

The test of significance used here is the chi square test. The chi-square statistic is 4.0431. The p-value is .044352. Hence there is a statistically significant difference in the occurrence of skin flap/umbilical necrosis between group A and group B at $p < .05$.

4: Analysis Of Post Operative Hospital Stay

Table 5:

(In days)	GROUP A	GROUP B
Mean	8.57	7.03
Median	8	7
Mode	8	7
Range	9	7
Minimum	4	4
Maximum	13	11
Interquartile range	4	2
Outliers	none	none

The average post-operative hospital stay in group A and group B are 8.57 and 7.03 days respectively. The test of significance used here is the unpaired students T test. The t-value is -2.68215. The p-value is .009513. The result is significant at $p < .05$. This implies a statistically significant difference in the duration of post-operative hospital stay between group A and group B.

DISCUSSION:

When the impact of incision on wound dehiscence and skin flap /umbilical necrosis was analyzed, we obtained the following data, 1) 36.67% of the patients developed wound dehiscence when vertical incision was used.

2) 10% of the patients developed wound dehiscence when horizontal incision was used.

3) 20% of the patients developed skin necrosis when vertical incision was used. (This included both marginal skin flap necrosis and umbilical necrosis).

4) 3.3% of the patients developed skin necrosis when horizontal skin incision was used.

5) Tests of statistical significance showed that horizontal incisions have lesser postoperative complications in terms of wound dehiscence and skin flap/umbilical necrosis when compared to vertical skin incision.

The impact on postoperative morbidity was analyzed by observing the number of days of hospital stay post procedure. The data can be summarized as follows,

- 1) The average post-operative hospital stay when vertical incision was used- 8.57 days.
- 2) The average post-operative hospital stay when horizontal incision was used- 7.03 days.

SUMMARY AND CONCLUSION:

Exact incision placement represents a compromise between target tissue exposure, skin tension lines (with considerations for scar formation and joint contracture), adjacent neurological structures and vascular supply. From this study we can derive the following conclusions.

- 1) Use of vertical incision in umbilical and paraumbilical hernia has a role only in large hernial defects and obese patients where difficulty is anticipated while raising flaps.
- 2) Use of horizontal skin incision has decreased incidence of post-operative wound dehiscence and skin necrosis, faster recovery from surgery and decreased post-operative hospital stay.

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