

A Clinical Study of Risk Factors in the Development of Incisional Hernias in Post Laparotomy Patients

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Abstract: The aim of the present study is to comprehensively study and evaluate the risk factors in the development of incisional hernia. Patients and methods: This hospital based prospective study includes 100 consecutive cases diagnosed with incisional hernia admitted in Siddhartha Medical College and General Hospital between December 2015 to December 2017. Results: Incisional hernias were most common in the 4th decade with the mean age 38.44 years. Obese females, pelvic surgeries, lower midline incisions and repeated surgeries were other significant risk factors and were found to be interlinked. Conclusion: Incidence of incisional hernias was found to be multifactorial, which requires adequate preoperative preparation and nutrition, weight loss advice, proper surgical technique and postoperative care to prevent wound infections.

Keywords: Incisional Hernias, Risk Factors, Post Laparotomy, Obesity

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I. Introduction

A postoperative ventral abdominal wall hernia, more commonly termed incisional hernia, is the result of a failure of fascial tissues to heal and close following laparotomy. The approximated tissues give way and abdominal organs, mainly bowel loops bulge through the gap, which is covered from inside outwards with peritoneum, scar tissue and skin. Incisional hernias have been reported in upto 20% of patients undergoing laparotomy. Modern rates of incisional hernia range from 2% to 11%¹. Among these, 80–95% develop within 6 months to 3 years after initial surgery.²

Incisional hernias are twice as common in women as in men. Obesity, malnutrition, advanced age, malnutrition, ascites, pregnancy, and conditions that increase intra-abdominal pressure are factors that predispose to the development of incisional hernia. Chronic pulmonary disease, diabetes mellitus, medications such as corticosteroids and chemotherapeutic agents and surgical site infections can contribute to poor wound healing and increase the risk for developing an incisional hernia.³

This study is undertaken to review the various factors and circumstances leading to the development of incisional hernia in each case and hence may be able to minimize its occurrence

II. Aims And Objectives

The Aim of the study is to assess the risk factors in the development of post laparotomy incisional hernias with one, or in various combinations, such as

- Age
- Sex
- Obesity
- History of previous wound infection
- The type of incision used
- The number of previous operations

III. Materials And Methods

3.1 SOURCE OF DATA: 100 Patients with incisional hernia admitted to surgical wards of Siddhartha Medical College and General Hospital between December 2015 to December 2017 (2 years).

3.2 STUDY DESIGN: Hospital based prospective study.

3.3 INCLUSION CRITERIA:

All patients of both sexes between the age group of 20-80 years, diagnosed with incisional hernia

3.4 EXCLUSION CRITERIA:

- Strangulated and Incarcerated Incisional Hernia
- Pregnancy with Incisional Hernia
- Patients with age < 20 years & > 80 years.
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3.5 METHOD OF COLLECTION OF DATA:

About 100 consecutive cases were admitted, examined, investigated and operated during the period of December 2015 to December 2017. Detailed history with specific reference to previous surgery / surgeries and the postoperative period, is elicited from the patient and verified with the previous records which are available with the patient.

IV. Observations And Results

The present study is a hospital based prospective study, which included a total of 100 cases that were studied over a period of 2 years, and were treated on inpatient basis at Government General Hospital, Vijayawada from December 2015 to December 2017.

Table 1: Age Distribution of Patients in Present Study

AGE GROUP	TOTAL NO. OF CASES (N=100)(%)
<20	0(0%)
21-30	24(24%)
31-40	44(44%)
41-50	20(20%)
>50	12(12%)

Mean age of presentation is 38.44 years. Minimum and Maximum age of presentation is 24 and 67 years. Most common age of presentation is in the 4th decade.

Table 2: Sex Distribution of Patients in Present Study

AGE GROUP	SEX	
	M	F
<20	0	0
21-30	2	22
31-40	6	38
41-50	2	18
>50	6	6

Male to female ratio is 1:5 showing a clear predilection towards female sex.

Table 3: Initial Operative Procedure done

PROCEDURE	NO. OF CASES	PERCENTAGE
Total Abdominal Hysterectomy	36	36
LSCS	24	24
Tubectomy	12	12
Incisional Hernia Repair	04	04
Emergency Laparotomy for Acute Abdomen	24	24

Table 4: Site of Previous Incision

PROCEDURE	NO. OF CASES	PERCENTAGE
Lower Midline	76	76
Midline	8	8
Upper Midline	12	12
Mc. Burney's	4	4

Table 5: No. Of Previous Surgeries

NO. OF SURGERIES	NO. OF CASES	PERCENTAGE
One	44	44
Two	26	26
>Two	30	30

V. Discussion

Incisional hernia usually appears from the 3rd decade onwards, the peak incidence is in the 4th decade. GoelDubey⁴, Harikrishnan & Karr⁵, Bhutia et al⁶ and Bhattarai et al⁷ also found more incidence in the 3rd, 4th and 5th decades.

Table 6: Age Distribution Compared with Literature

Age Group in years	GoelDubey ⁴ (1981)	Harikrishnan & Karr ⁵ (1991)	Bhutia et al ⁶ (1993)	Bhattarai ⁷ (2010)	Present series
<20	4%	-	1.4%	0	0%
21-30	23%	16%	23.1%	4.1%	24%
31-40	30%	37%	31.3%	25%	44%
41-50	28%	25%	30.5%	33.3%	20%
>50	15%	22%	13.7%	25%	12%

Table 7: Sex Distribution compared with Literature

Sex	Dasilva and Patroianu ⁸	W.T. Bhutia ⁶	Manohar et al ⁹ (2010)	Present series
Male	19%	11%	12%	16%
Female	81%	89%	88%	84%

In this study 84% were females and male to female ratio being 1:5. Dasilva⁸, W.T. Bhutia⁶ and Manohar⁹ also found more incidence among females. High incidence of incisional hernia is seen in young and middle aged females, whereas the same incidence is not seen in males. This can be explained by multiparity and repeated surgeries on female pelvic organs.

Table 8: Initial Operative Procedure Compared with Literature

Procedure	Harikrishnan ⁵ (1991)	Bhattarai ⁷ (2010)	Present Series
Total Abdominal Hysterectomy	24.1%	17%	36%
LSCS	42%	33.3%	24%
Tubectomy	11.1%	8.3%	12%
Acute Abdomen with Peritonitis	13.3%	17%	24%
Incisional hernia Repair	-	-	4%

In our study 72% of the incisional hernias occurred following operations on female pelvic organs. Harikrishnan and J.K. Karr⁵ have also found operations on female pelvic organs were being the commonest surgeries which lead to the development of incisional hernia (77.2%). Bhattarai⁷ in 2010 also found similar results in his study.

Table 9: Site of Previous Incision Compared with Literature

Type of Incision	Goel Dubey ⁴	Manohar et al ⁹ (2010)	Present Series
Lower Midline	48%	74%	76%
Mc. Burney's	5%	2%	4%
Upper midline	29%	8%	12%
Mid Midline	-	-	8%

In our present study 76% of incisional hernias appeared in the lower midline incisions. GoelDubey⁴ found 48% incisional hernias through lower midline incisions. Manohar⁹ et al found 74% incisional hernias were through sub umbilical midline incision. Repeat surgery done through a lower midline incision resulted in incisional hernia in 68.4 percent of patients in our study, whereas repeat surgery done through other incisions resulted in 16% of cases, showing a strong association.

VI. Summary

1. Our study established highest incidence of incisional hernia in the present series is between 31 – 40 years.
2. Mean Age of presentation is 38.44 years
3. Most of our patients were females
4. Etiology is multifactorial

5. Operations on the female pelvic organs were the most common procedure preceding the development of incisional hernia.
6. Obesity is a common predisposing factor.
7. Postoperative wound infection at previous surgery site seems to be a common predisposing factor.
8. Lower midline incision appears to have a special predilection towards incisional hernia.
9. Repeated surgery through the same incision has a role in the occurrence of incisional hernia, as it weakens the surrounding tissues.
10. All these factors are interrelated. Presence of more than one factor in a patient shows increased predisposition to the incidence of incisional hernia.
11. Obese females have an increased predilection towards incisional hernia ($p = 0.05$).
12. Obesity is associated with more risk of postoperative wound infection and both resulted in an increased incidence of incisional hernia ($p < 0.05$).
13. Lower midline incision on obese people has a predilection for incisional hernia. ($p < 0.005$).
14. Repeated surgery done through a lower midline incision carries an increased incidence of incisional hernia ($p < 0.005$).

VII. Recommendations

The prevention of incisional hernia poses a difficult challenge because of its multifactorial etiology.

- To avoid development of incisional hernia preoperative nutritional status and hemoglobin levels should be satisfactory.
- Smoking should be stopped and breathing / chest exercises instituted.
- Weight reduction should be encouraged.
- Glycaemic control should be done preoperatively in Diabetic patients as Hyperglycaemia is related to susceptibility of Diabetics to wound infection.
- Any conditions leading to cause an increase in intra abdominal pressure must be treated.
- Any predisposing factors like Prostatism, Chronic cough & constipation should be adequately treated preoperatively.
- During the surgical procedure, strict aseptic measures to be taken, ensure adequate hemostasis and tissue handling should be done with utmost care.
- The most reliable non – absorbable sutures (like Polypropylene) or long term absorbable sutures like Polydioxane- S should be used to prevent Incisional Hernia.
- The double stranded suture type providing nearly twice the initial tensile strength of a single strand of the same diameter may be valuable in high risk patients (i.e, Obesity).
- Postoperative complications like abdominal distension, wound infection and wound dehiscence should be prevented and energetically treated.

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