

Comparative study of incisional hernia in relation to various risk factors

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Abstract

Introduction: Hernia is a protrusion of a viscus or part of viscus through an abnormal opening in the wall of its containing cavity.

Aims & Objectives: This study aims at determining the association of incisional hernia with one, or in various combinations of more specific risk factors such as age, sex, obesity, history of previous wound infection, the type of incision used and the number of previous operations.

Material and Methods: Fifty patients with incisional hernia admitted to surgical wards of Government Medical College, Mahabubnagar District, form the material of this study. This is a longitudinal study. The study period extends from April 2019 to March 2020. Patients were selected randomly. 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.

Results: Incisional hernia is common in the 3rd decade of life in obese females. Operations on the female pelvic organs were the most common procedure preceding the development of incisional hernia. Postoperative wound infection at previous surgery & repeated surgeries through the same incision are associated risk factors for development of incisional hernia.

Keywords: Incisional Hernia, Risk factors, Incidence

Introduction

Hernia is a protrusion of a viscus or part of viscus through an abnormal opening in the wall of its containing cavity ^[1].

A postoperative ventral abdominal or incisional hernia is the result of failure of the lines of closure of the abdominal wall following laparotomy. The approximated tissues give away, and abdominal organs, mainly bowel loops bulge through the gap, which is covered from inside outwards with peritoneum, scar tissue and skin ^[2].

Incisional hernia is a serious post-operative complication of laparotomy. Its incidence following abdominal surgery ranges from 2-11%.

A number of predisposing factors have been identified that may be related to individual patient characteristics, and underlying pathological process or iatrogenic factors.

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.

Aim of the study

This study aims at determining the association of incisional hernia with one, or in various combinations of more specific risk factors such as age, sex, obesity, history of previous wound infection, the type of incision used and the number of previous operations.

Material and Methods

Fifty patients with incisional hernia admitted to surgical wards of Government Medical College Mahabubnagar District, This is a longitudinal study. The study period extends from April 2019 to March 2020. Patients were selected randomly.

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.

The following risk factors are studied.

- Age
- Sex
- Obesity - Body mass index above 30 is taken as obesity in this study.
- Wound Infection - History of any purulent discharge from the wound is considered as wound infection.
- Second Surgery through the same incision.

The association of incisional hernia with these risk factors with one and in combination is studied.

Statistical Analysis

Data is analysed manually: The correlation between various factors is analysed by Chi-square test. $p < 0.05$ is taken as statistically significant.

Observations and results: The total number of cases studied in this series is 50.

Age Distribution: In this series incisional hernia is common in 3rd, 4th and 5th decade.

Table 1: Age distribution

Age group	Total No. of cases	Percentage
<20	Nil	-
21-30	12	24
31-40	22	44
41-50	10	20
>50	6	12

Table 2: Sex distribution

Age Group	Sex	
	M	F
<20	0	0
21-30	1	11
31-40	3	19
41-50	1	9
>50	3	3

In this series incisional hernia is seen in 84% of female and 16% of males and male to female ratio being 1:5 showing a clear predilection towards female sex.

Initial Operative Procedure

Table 3: Initial operative procedure

Procedure	No. of cases	Percentage
Hysterectomy	18	36
LSCS	12	24
Tubectomy	6	12
Incisional Hernia repair	2	4
Acute abdomen	12	24

Seventy two percent of the hernias followed operations on female pelvic organs. 4% followed after incisional hernia repair and 24% cases followed after acute abdominal procedures. No case of incisional hernia following elective abdominal surgery.

Site of previous incision

Table 4: Site of previous incision

Type of Incision	No. of case	Percentage
Subumbilical Midline	38	76
Mc. Burney's	2	4
Mid Midline	4	8
Upper Midline	6	12

76 percent of incisional hernias recurred in subumbilical midline incisions.

No. of previous surgeries

Table 5: No. of previous surgeries

No. of Surgeries	No. of cases	Percentage
One	22	44
Two	13	26
>Two	15	30

Incisional hernia recurred in 56 percent of cases following a second surgery.

Wound Infection

Wound infection is present in 26 cases amounting to 52% of incisional hernias.

The correlation between incisional hernia and various factors is established by employing Chi

square test.

In our study among the obese people 92.5 percent were females P value is close to 0.05 and shows a clear association between obesity and female sex. It needs a larger study to further emphasize the association more strongly.

Among the obese people 66.66 percent had wound infection during previous surgery. The P value is 0.05 showing a strong association between obesity and wound infection to the occurrence of incisional hernia.

Obese people with SUMI constitute 96.3% and non-obese with SUMI were 52%. P value is <0.005 showing a very strong correlation between obesity and sub umbilical midline incision to result in incisional hernia.

Lower midline incision compared to other incisions with repeated surgeries through the same scar, the incidence of incisional hernia is 68.42% and 16.67% respectively. This study shows a very strong correlation ($p < 0.005$) between repeat surgery through lower midline incision to the occurrence of incisional hernia.

Discussion

Fifty patients participated in this prospective study done during a time span of 12 months from April 2019 to March 2020.

Incisional hernia usually appears from the 3rd decade onwards, the peak incidence is in the 4th decade. Goel and Dubey^[3], Harikrishnan & Karr^[4], Bhutia *et al.*,^[5] and, bhattarai *et al.*,^[6] also found more incidence in the 3rd, 4th and 5th decades In this study 84% were females 16% males and male - female ratio being 1:5 Dasilva⁷, W.T. Bhutia^[5] and Manohar 1:5 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.

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

Bhattarai (2010)^[6] also found similar results in his study.

In our present study 76% of incisional hernias appeared in the subumbilical midline incisions. Goel A Dubey^[3] found 48% incisional hernias through lower midline incisions. Manohar⁵⁵ *et al.*, found 74% incisional hernias were through sub umbilical midline incision.

In our present study infection was present in 52 percent of cases. T.E. Bucknall⁵⁶ and colleagues reported that the index operation has been complicated by post-operative wound infection in 48 percent of patients who subsequently developed incisional hernia.

Ponka(1980) reported wound infection in 58% of cases in his study.

In our study 54 *et al* patients with incisional hernia found to be obese. J.L. Ponka attributed 40 *et al* of incisional hernias to obesity. Marc H. F. Schreinemache (2010) observed 59.1% incisional hernias in obese individuals.

In our study repeated surgery through the same incision resulted in an incisional hernia in 56 *et al* of cases. Elish & Lamont found the incidence of incisional hernia was 6% after freshly made incisions and the incidence increased after both reincision (12 *et al* $p < 0.05$) and incisional hernia repair. (44 *et al* $p < 0.01$).

Incidence of incisional hernia appears to be multifactorial and these factors are interrelated association of one or more factors increase the predisposition to the incisional hernia. An attempt is made to study this inter relationship of these factors to the incidence of hernia using the Chi- square test.

Obese females have a specific predilection towards occurrence of incisional hernia as the $p \sim 1.5$ our study sample is relatively small we feel a larger study is needed to emphasize this

association more strongly.

Obesity is prone to wound infection, as 66.66% of obese people had a history of wound infection, as against 34% of non – obese people.

Obesity and wound infection show an association to incisional hernia with $p < 0.05$.

Obese people with lower midline incision constitute 96.3% and non obese with lower midline incision was 52%. There appears a strong association between lower midline incision in an obese person to the occurrence of incisional hernia ($p < 0.05$).

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 ($p < 0.005$).

Conclusions

- Incisional hernia is common in the 3rd decade of life in obese females.
- Operations on the female pelvic organs were the most common procedure preceding the development of incisional hernia.
- Postoperative wound infection at previous surgery & repeated surgeries through the same incision are associated risk factors for development of incisional hernia.

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