

# Study of Incisional Hernia in Relation to Specific Risk Factors

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## Abstract

**Background:** Incisional hernia is a serious post-operative complication of laparotomy. Its incidence following abdominal surgery ranges from 2% to 11%, and it accounts to 15–20% of all abdominal wall hernias. A number of predisposing factors have been identified which may be related to specific patient characteristics and underlying pathological process or iatrogenic factors.

**Materials and Methods:** This prospective study was conducted in 40 cases of incisional hernia in isolation or in various combinations of specific risk factors such as sex, obesity, diabetes mellitus, history of previous wound infection, the site and type of incision used, and indication for previous operations admitted in surgical unit of Mahatma Gandhi Memorial Hospital, Kakatiya Medical College, Warangal, Telangana State, India, from June 2015 to December 2017. The results were analyzed.

**Results:** The total number of cases studied in the series is 40. In this series, incisional hernia is found to be common in third and fourth decades with 80% of females and 20% of males and female-to-male ratio is being 4:1, showing a clear predilection toward female sex. 75% of incisional hernias followed operations on female pelvic organs. 5% followed after unspecified laparotomy (lump abdomen) and 20% of cases followed after acute abdominal procedures. 75% of incisional hernias occurred through subumbilical midline incisions.

**Conclusion:** The highest incidence of incisional hernia in the present series is between the age group of 21 and 30 years. Most of our patients were females. Multiple predisposing factors are noticed to the occurrence of incisional hernia. Operations on the female pelvic organs were the most common procedures preceding the development of incisional hernia. Obesity is a common predisposing factor. Post-operative wound infection at previous surgery seems to be a common predisposing factor. Lower midline incision appears to have a special predilection toward incisional hernia. All these factors are interrelated. The presence of more than one factor in a patient shows increased predisposition to the incidence of incisional hernia. Obese female has an increased predilection toward incisional hernia. Obesity is associated with more risk of post-operative wound infection and both resulted in an increased incidence of incisional hernia.

**Key words:** Incisional hernia, Lax abdominal muscles, Subumbilical midline incision

## INTRODUCTION

Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the wall of its containing cavity. An incisional hernia is any herniation of anterior

abdominal wall that occurs through a previous surgical incision. It is a type of ventral hernia.

A post-operative ventral abdominal or incisional hernia is the result of failure of the fascial tissues to heal and close the following laparotomy.<sup>[1]</sup>

Incisional hernia is a serious post-operative complication of laparotomy. Its incidence following abdominal surgery ranges from 2% to 11%.<sup>[1]</sup>

Moreover, it accounts for 15–20% of all abdominal wall hernias.<sup>[2]</sup>

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A number of predisposing factors have been identified which may be related to specific 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 Table 1.

## MATERIALS AND METHODS

The study is a prospective study carried at Mahatma Gandhi Memorial Hospital, Warangal, between June 2015 and December 2017. A total number of 40 cases were studied. The study aims to determine the association of incisional hernia in isolation or various combinations of specific risk factors such as sex, obesity, diabetes mellitus (DM), history of previous wound infection, the site and type of surgical incision used, and indication for previous operations.

This study includes cases spread over a period from June 2015 to December 2017.

Patients were selected randomly.

There was a detailed history with specific reference to previous surgery/surgeries, and the post-operative period is elicited from the patient and verified with the previous records which are available with the patient. The following risk factors are studied.

- Sex,
- Obesity - body mass above 30 is taken as obesity in this study,
- DM,
- Wound infection: History of any percentage discharge

(serosanguinous/pus) from the wound is considered as wound infection,

- Site and type of incision used for previous surgery,
- Indication for previous surgery.

The association of incisional hernia with these risk factors both independently and in combination is studied. After pre-operative workup, patients were operated by a method, most suited for the individual. Post-operative management comprised of antibiotics, intravenous fluids, and Ryles tube aspiration in cases where peritoneum has opened. The subcutaneous drain kept on the wound is removed after serous discharge has decreased. Sutures are removed on 9<sup>th</sup> post-operative day, and prophylactic abdominal corset is advised for each patient post-operatively for 3 months. Patients are advised to desist from strenuous work for about 3 months.

## RESULTS

The total number of cases studied in the series is 40. In this series, incisional hernia is found to be common in third and fourth decades with 80% of females and 20% of males and female-to-male ratio is being 4:1.

Showing a clear predilection toward female sex Table 2.

75% of incisional hernias occurred through subumbilical midline incisions (SUMLs).

Wound infection is present in 18 cases amounting to 45% of incisional hernias Table 3.

Seventyfive percent of incisional hernias followed operations on female Pelvic organs. 5% followed after unspecified laparotomy (lumpabdomen) and 20% of cases followed after acute abdominal procedures.

**Table 1: Age and sex distribution**

Age group	Sex		Total number of cases (%)
	Male	Female	
<20	0	1	1 (2.5)
21-30	1	11	12 (30)
31-40	2	9	11 (27.5)
41-50	1	7	8 (20)
>50	4	4	8 (20)

**Table 2: Site of previous incision**

Type of incision	Number of cases (%)
Subumbilical Midline	30 (75)
Mc. Burney's	2 (5)
Mid midline	1 (2.5)
Upper midline	5 (12.5)
Pfannenstiel	1 (2.5)
Paramedian	1 (2.5)

**Table 3: Initial operative procedure**

Procedure	Number of cases (%)
Hysterectomy	14 (35)
LSCS	10 (25)
Tubectomy	6 (15)
Acute abdomen	8 (20)
Unspecified laparotomy	2 (5)

LSCS: Lower segment Cesarian section

**Table 4: Obesity and SUML**

Obese / Non-obese	SUML	Other incisions	Total	Incidence (%)
Obese	21	3	24	87.5
Non-obese	9	7	16	56.25
Total	30	10	40	

SUML: Subumbilical midline incision

In our study, 60% of patients with incisional hernia were found to be obese. Among the obese people, 62.5% had wound infection during previous surgery. In our study, obese people with DM show the significant correlation between obesity, DM, and incidence of incisional hernia Table 4.

In our study, the obese people with SUML constitute 87.5%.

## DISCUSSION

Incisional hernia is commonly seen in third and fourth decades. In this series, peak incidence of Incisional hernia is seen in the 3<sup>rd</sup> decade. In this study, 80% were females and female-to-male ratio is being 4:1. High incidence of incisional hernia is seen in young- and middle-aged females, whereas the same incidence was not seen in males. This can be explained by multiparity and repeated surgeries on female pelvic organs. In our study, 75% 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 77.8%.<sup>[3]</sup> Agarwal in his series found 87% of incisional hernia were after female pelvic organ surgeries. E A Agbak Wuru J.K.Olabanji et al identified, women pelvic organ surgeries plays major role, specially incisional hernia following emergency caesarian section 59%.<sup>[5]</sup> Maximum incidence of hernia is seen with midline incisions that too with infraumbilical incisions. Ponka JL found 36% of incisional hernia through the midline infra Umbilical incision<sup>[4]</sup> EA Agbak (2009) also found that 81.9% incisional hernias occur through The midline infraumbilical incision.<sup>[5]</sup>

This may be because of:

- Intra-abdominal hydrostatic pressure is higher in the lower abdomen compared to the upper abdomen in erect position, i.e., 20 cm of water and 8 cm of water, respectively.
- Absence of posterior rectus sheath below arcuate line.
- This incision is used for mostly gynecological surgery inpatients who have poor abdominal wall musculature.

In the present study, 20% of patients with incisional hernia are found to have DM.

Among this, 75% of diabetic patients are obese, and about 50% of diabetic patients developed wound infection post-operatively following first surgery.

Obese patients with diabetes are more prone to wound infection, which acts as a cumulative risk factor for the development of incisional hernia.

## CONCLUSION

- Highest incidence of incisional hernia in the present series is between the age group of 21 and 30 years.
- Most of our patients were females.
- Multiple predisposing factors are noticed to the occurrence of incisional hernia.
- Operations on the female pelvic organs were the most common procedures preceding the development of incisional hernia.
- Obesity is a common predisposing factor.
- Post-operative wound infection at previous surgery seems to be a common predisposing factor.
- Lower midline incision appears to have a special predilection toward incisional hernia.
- All these factors are interrelated. The presence of more than one factor in a patient shows increased predisposition to the incidence of incisional hernia.
- Obese female have an increased predilection toward incisional hernia.
- Obesity is associated with more risk of post-operative wound infection and both resulted in an increased incidence of incisional hernia.
- Lower midline incision in obese people have a predilection for incisional hernia.
- Diabetic patients are more prone to post-operative wound infection and both result in an increased incidence of incisional hernia.

## Regarding Management Aspects

1. In elective operations:
  - a. Obesity must be reduced; it should start at least 2 months before surgery.
  - b. In patient with lax abdominal muscles, physiotherapy of muscles should be done.
  - c. Hypertension and diabetes must be controlled effectively before surgery.
  - d. Improvement of nutritional status has to be done.
  - e. Anemia and vitamin deficiency should be corrected.
2. During surgery:
  - a. Plan anatomical incisions.
  - b. Perfect hemostasis must be achieved.
  - c. Minimal handling of tissues should be done.
  - d. For closure, use non-absorbable suture material which must be non-toxic, pliable, strong, durable, and resistant to fatigue such as polypropylene and polyamide.
  - e. Suture should be taken 1cm from the edge and

spaced at interval of 0.5 cm from one another.

- f. Always drain whenever oozing, serous discharge is anticipated to prevent wound infection.
3. Prophylactic abdominal corset is advised to be applied after the post-operative period for 3 months in high-risk cases.
4. Patients must be advised not to resume strenuous work, especially manual laborers.
5. As all types of repair have equally good prognosis, the method should be selected according to the individual merits and best suited for the patient.

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