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## Original Article

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# The study of risk factors in the development of postlaparotomy incisional hernias - a study from tertiary care centre

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### Abstract:

Incisional Hernia is a long term complication of laparotomy. Its exact frequency varies but is around 10 -15 %. The Aim of the study is to assess the risk factors in the development of incisional hernia with one, or in various combinations such as Age, Sex, Obesity, History of previous wound infection, The type of incision used and The number of previous operations through the same incision are studied. Longitudinal study of 100 patients with incisional hernia admitted to surgical wards of Yashoda Hospital during May 2012 to April 2014. Post operative wound infection at previous surgery & repeated surgeries through the same incision are associated risk factors for development of incisional hernia.

**Key words:** Laparotomy; Incisional hernia, tertiary care centre

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### INTRODUCTION:

Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the wall of its containing cavity. Incisional hernias arise through a defect in the musculo fascial layers of the abdominal wall in the region of a post operative scar. Thus they may appear anywhere on the abdominal surface.<sup>1</sup> 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%.<sup>2</sup>

Incisional herniae may become apparent during the early months after surgery when there has almost certainly been some deep wound dehiscence in the postoperative period.<sup>3</sup> An incisional hernia usually starts as a symptomless partial disruption of the deeper layers of a laparotomy wound during the immediate or very early postoperative period. A serosanguinous discharge is often the signal of

dehiscence.<sup>3</sup> Based on National operative statistics, incisional hernia accounted for 15 to 20 % of all abdominal wall hernias. Incisional hernias are twice as common in women as in men. The incidence of ventral herniation after mid line laparotomy ranged from 3% to 20% and doubles if the operation was associated with a surgical site infection.<sup>4</sup> Among these, 80–95% develop within 6 months to 3 years after initial surgery.<sup>5</sup> 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.<sup>6</sup>

The financial cost of the repair of an Incisional Hernia is approximately USD 6,000, without considering the loss of productivity. Hence, one can imagine the important economic impact of reducing the incidence of Incisional Hernia in this era of retraction of resources.<sup>7</sup>

Return of displaced viscera to the abdominal cavity during repair may lead to increased intra abdominal pressure, abdominal compartment syndrome, and acute respiratory

failure.<sup>8</sup> Repair of incisional hernias can be technically challenging. The most important distinctions in describing surgical management of incisional hernias are Anatomical vs. mesh repair and Conventional vs. laparoscopic repair. Anatomical repairs for incisional hernia include both simple suture closure and components separation. Anatomical suture repair of abdominal wall incisional hernias is associated with an unacceptably high incidence of hernia recurrence, and has prompted the wide use of prosthetic mesh materials for hernia repair. Mesh repair has become the gold standard in the elective management of most incisional hernias. Mesh repairs can be categorized according to the way in which mesh is placed as well as its relationship to the abdominal wall fascia. Broadly, meshes can be synthetic or biologic. Permanent (synthetic) prosthetic mesh implants are made of materials that do not degrade over time, whereas absorbable (Biological) meshes are degraded, primarily by hydrolytic enzyme activity. Biologic meshes are prepared from collagen-rich porcine, bovine, or human tissues from which all antigenic cellular materials are removed. These properties provide distinct advantages in infected or contaminated cases in which synthetic mesh is thought to be contraindicated.<sup>9</sup>

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.

## MATERIAL AND METHODS

**Study Design:** Longitudinal study

**Study Population:** We recruited 100 patients with incisional hernia admitted to surgical wards in the Department of General surgery, Yashoda Hospital, Secunderabad, during the study period from May 2012 to April 2014. This study was approved by the Scientific committee and Ethics committee.

Patients with incisional hernia- 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.

### INCLUSION CRITERIA FOR THE STUDY:

- All patients between age 20 to 80 years with Incisional Henia .
- Both the sexes.

### EXCLUSION CRITERIA:

- Strangulated and Incarcerated Incisional Hernia
- Pregnancy with Incisional Hernia
- Patients with age < 20 years & > 80 years.

## RESULTS & DISCUSSION

Hundred patients participated in this prospective study done during a time span of 22 months from May 2012 to April 2014

Incisional hernia usually appears from the 3<sup>rd</sup> decade onwards, the peak incidence is in the 4<sup>th</sup> decade.

Goel and Dubey<sup>10</sup>, Harikishnan & Karr<sup>11</sup>, Bhutia et al<sup>12</sup> and Bhattarai et al<sup>13</sup> also found more incidences in the 3<sup>rd</sup> 4<sup>th</sup> and 5<sup>th</sup> decades.

In this study 84% were females and male to female ratio being 1:5.

Dasilva<sup>14</sup>, W.T. Bhutia<sup>12</sup> and Manohar<sup>15</sup> 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 1: Initial operative procedure compared with literature**

Procedure	Harikrishnan <sup>11</sup> (1991)	Bhattarai <sup>13</sup> (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. Karr<sup>11</sup> have also found operations on female pelvic organs were being the commonest surgeries which lead to the development of incisional hernia (77.2%). Bhattarai<sup>13</sup> in 2010 also found similar results in his study.

**Table 2: Site of previous incision compared with literature**

Type of Incision	Goel & Dubey <sup>10</sup>	Manohar et al <sup>15</sup> (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.

Goel A Dubey<sup>10</sup> found 48% incisional hernias through lower midline incisions. Manohar<sup>15</sup> et al found 74% incisional hernias were through sub umbilical midline incision.

**Table 3: Wound infection compared with literature**

	T.E. Bucknall et al <sup>16</sup>	Ponka <sup>17</sup> 1980	Present series
Wound infection	48%	58%	52%

In our present study infection was present in 52 percent of cases.

T.E. Bucknall<sup>16</sup> 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<sup>17</sup>(1980) reported wound infection in 58% of cases in his study. In our study 54% patients with incisional hernia found to be obese. J.L. Ponka<sup>17</sup> attributed 40% of incisional hernias to obesity. Marc H.F Schreinemache<sup>18</sup> (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% of cases.

Ellish & Lamont<sup>19</sup> found in incidence of incisional hernia was 6% after freshly made incisions and the incidence increased after both re-incision (12% p < 0.05) and incisional hernia repair (44% 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 ~ 0.05 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, where as repeat surgery done through other incisions resulted in 16% of cases, showing a strong association (p<0.005).

**CONCLUSION:**

- Incisional hernia is common in the 3<sup>rd</sup> decade of life in obese females.
- Mean Age of presentation is 38.44 years.
- Operations on the female pelvic organs were the most common procedure preceding the development of incisional hernia.
- Post operative wound infection at previous surgery & repeated surgeries through the same incision are associated risk factors for development of incisional hernia

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**Source of Support: Nil. Conflict of Interest: None.**

**Cite this article as:** Laxmana Sastry G , Siva Rama Krishna Rao M, Swathi. The study of risk factors in the development of postlaparotomy incisional hernias - a study from tertiary care centre. MRIMS J Health Sciences 2015;3(2):89-91.