



# Incisional Hernia Post Laparotomy-Incidence and Risk Factors

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**Abstract:** Laparotomy incisions are one of the most common procedures performed in any surgical service. However, they carry certain risks like surgical site infections, wound dehiscence and incisional hernia. There have been various risk factors associated with the incidence of incisional hernia post laparotomy. Some of these factors are patients- related like history of diabetes, obesity, smoking, sex and age. The other factors are related to the disease process itself like emergency surgeries, presence of peritonitis, history of radiation to the abdominal cavity or presence of surgical site infection. Another set of factors relates purely with the technique used to close the wound, choice of suture material and expertise of the surgeon. Methods. This is a retrospective chart review. Data was collected from all patients who were previously admitted at Hamad General Hospital for laparotomy and subsequently developed incisional hernia. Methods. All patients of age 18 years or above who were found to have incisional hernia after laparotomy were included in the study. Hospital medical records database were used for file reviews. Patients characteristics like age, sex, obesity, history of smoking, DM etc were recorded. Nature of surgeries like emergency or elective were documented along with other factors like suturing techniques etc. Results. The total number of study subjects was 672, out of which 47 (6.9%) developed incisional hernia. Out of these 23 were male and 24 were female. Diabetes was identified in 18 patients (38.3%) whereas the incidence of smoking, steroid use, COPD and obesity was 2 (4.3%), 0 (%), 3 (6.4%) and 7 (14.9%) respectively. Other risk factors like the nature of surgery (emergency vs electives) were addressed also. The incidence of immediate postop complications was also addressed. Three patients out of 47 (6.4%) developed surgical site infection whereas one patient (2.1%) had post -op wound dehiscence. The number of contaminated and dirty wounds during the initial surgery was 10 (21.3%) and 6 (12.8%) respectively.

**Keywords:** Laparotomy, Incisional Hernia, Risk Factors, Incidence

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## 1. Introduction

Laparotomy incision has been the standard for abdominal surgeries. It gives better and easy access to the abdominal cavity. However, it carries certain risks like surgical site infections, wound dehiscence and incisional hernia [1, 2, 7]. There have been various risk factors associated with the incidence of incisional hernia after laparotomy. Some of these factors are patients- related like history of diabetes, obesity, smoking, sex and age [3, 5, 9]. The other factors are

related to the disease process itself like emergency surgeries, presence of peritonitis, history of radiation to the abdominal cavity or presence of surgical site infection [2, 3, 8].

Incisional hernia is one of the most common complications after laparotomy. The reported incidence is highly variable depending on underlying disease, type of incision used, length of follow up and method for hernia detection. Numerous risk factors associated with an increased incisional

hernia incidence have been reported, including gender (both male and female), age, surgical site infection, obesity and aortic aneurysm [1, 4, 11, 6]. Another set of factors relates purely with the technique used to close the wound, choice of suture material and expertise of the surgeon [2, 4, 7, 11].

Research studies have been conducted before aiming at the potential risk factors for the development of incisional hernia after laparotomies. Millburn D et al, studied the effect of stitch length on the incidence of surgical site infection, wound dehiscence and incisional hernia after midline laparotomy surgeries. They found out that the incidence of incisional hernia, wound dehiscence and surgical site infection was much lower when the stitches were placed near to the wound edge (5-8mm) than long traditional stitches which are placed more than 1 cm from the wound edge [2]. In the same study male sex, obesity, diabetes, presence of wound contamination were found to have as independent risk factors for the incidence of incisional hernia [2].

Incisional hernia can be a challenging clinical problem especially in morbidly obese patients, patients who have diabetes and who are steroid users. Other researchers have studied the clinical impact of morbid obesity and steroid use on the incidence of incisional hernia and found to have a protective effect of polypropylene mesh on the incidence of incisional hernia [4, 9, 11].

## 2. Materials and Methods

### 2.1. Data Source and Study Population

Data was collected from the hospital patients' database from the medical records office.

Hospital medical records database were used for file reviews. Patient's characteristics like age, sex, obesity,

history of smoking, DM etc. were recorded. Nature of surgery, like emergency or elective was documented along with other factors like suturing techniques etc.

### 2.2. Inclusion Criteria

All patients aged 18 years or above who were previously admitted to our hospital for abdominal surgery and subsequently developed incisional hernia after laparotomy incisions.

### 2.3. Exclusion Criteria

Patients below 18 years were excluded.

## 3. Data Analysis

Data obtained was compiled in a systemic way and analyzed by using SPSS database for the presence of different risk factors.

*Table 1. Patient Demographics and Characteristics of Surgery.*

Demographic	
Age (years, M (SD))	53.22 (15.22)
Type of surgery N (%)	
Emergency	23 (48.9)
Elective	24 (51.1)
Wound Condition N (%)	
Clean	9 (19.1)
Clean contaminated	22 (46.8)
Contaminated	10 (21.3)
Dirty	6 (12.8)
Post op complications N (%)	
None	43 (91.5)
SSI	3 (6.4)
Wound dehiscence	1 (2.1)

*Table 2. Incidence of risk factor variables.*

SEX		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	24	51.1	51.1	51.1
	M	23	48.9	48.9	100.0
	Total	47	100.0	100.0	
Diabetes		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	61.7	61.7	61.7
	1.0	18	38.3	38.3	100.0
	Total	47	100.0	100.0	
smoking		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	45	95.7	95.7	95.7
	1.0	2	4.3	4.3	100.0
	Total	47	100.0	100.0	
Steroid use		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	47	100.0	100.0	100.0

<b>obesity</b>					
		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
	0	40	85.1	85.1	85.1
Valid	1.0	7	14.9	14.9	100.0
	Total	47	100.0	100.0	

  

<b>COPD</b>					
		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
	0	44	93.6	93.6	93.6
Valid	1.0	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

0= absent; 1=present.

## 4. Results

The total number of study subjects was 672 out of which 47 (6.9%) developed incisional hernia. Out of those who developed hernia, 23 were male and 24 were female. Diabetes was identified in 18 patients (38.3%) whereas the incidence of smoking, steroid use, COPD and obesity was 2 (4.3%), 0 (%), 3 (6.4%) and 7 (14.9%) respectively.

In terms of type of surgery, about half (48.9) were emergency surgeries, while the other half (51.1) were elective. The number of contaminated and dirty wounds during the initial surgery was 10 (21.3%) and 6 (12.8%) respectively. Surgical site infection was encountered in 3 (6.4%) cases and wound dehiscence happened in 1 (2.1%) patient.

## 5. Discussion

In this study we report the incidence and risk factors for the incidence of incisional hernia post abdominal surgery. Though the indications for the initial surgery were very varied and the patient population is not homogenous, still there is a great deal of information available from our study.

The total number of study subjects was 672 out of which 47 (6.9%) developed incisional hernia. Out of these 47, 23 were male and 24 were female. Diabetes was identified in 18 patients (38.3%) whereas the incidence of smoking, steroid use, COPD and obesity was 2 (4.3%), 0 (%), 3 (6.4%) and 7 (14.9%) respectively.

Other risk factors like the nature of surgery (emergency vs electives) were also addressed.

The incidence of immediate postop complications was also addressed. It is pertinent to note that only three patients out of 47 (6.4%) developed surgical site infection whereas only one patient (2.1%) had post -op wound dehiscence. These are major risk factors for the incidence of incisional hernia in other studies so their influence on the incidence of incisional hernia has been kept in check in our institution. This is a significant finding given the number of contaminated and dirty wounds during the initial surgery was 10 (21.3%) and 6 (12.8%) respectively.

The incidence of incisional hernia post abdominal surgery is an important matter which carries health related amplifications for the patients and cost and quality related issues for surgeons and hospitals [8, 12].

Laparotomy incision has been the standard for abdominal surgeries. It gives better and easy access to the abdominal cavity. However, it carries certain risks like surgical site infections, wound dehiscence and incisional hernia. There have been various risk factors associated with the incidence of incisional hernia after midline laparotomy. Some of these factors are patients- related like history of diabetes, obesity, smoking, sex and age. [3, 5, 9]. The other factors are related to the disease process itself like emergency surgeries, presence of peritonitis, history of radiation to the abdominal cavity or presence of surgical site infection. [2, 3, 8].

Another set of factors relates purely with the technique used to close the wound, choice of suture material and expertise of the surgeon [2, 4, 7, 11].

Research studies have been conducted before aiming at the potential risk factors for the development of incisional hernia after midline laparotomies. Millburn D et al, studied the effect of stitch length on the incidence of surgical site infection, wound dehiscence and incisional hernia after midline laparotomy surgeries. They found out that the incidence of incisional hernia, wound dehiscence and surgical site infection was much lower when the stitches were placed near to the wound edge (5-8mm) than long traditional stiches which are paced more than 1 cm from the wound edge [2]. In the same study male sex, obesity, diabetes, presence of wound contamination was found to have as independent risk factors for the incidence of in incisional hernia [2].

Studies have also been conducted about the optimum time of surveillance for the occurrence of incisional hernia post abdominal surgery. In one of the studies the authors demonstrated that one year of follow-up is usually not sufficient for the clinical detection of incisional hernia but should be done for at least 3 years [6, 8]. In our study also the minimum time for occurrence of incisional hernia was reported to be 120 days and the maximum was 4320 days (with a mean of 684 days).

Incisional hernia can be a challenging clinical problem especially in morbidly obese patients, patients who have diabetes and who are steroid users. Other researches have studied the clinical impact of morbid obesity and steroid use on the incidence of incisional hernia and found to have a protective effect of polypropylene mesh on the incidence of incisional hernia [7, 4, 11].

## 6. Conclusion

The assessment of risk factors for the incidence of incisional hernia was carried out in this study. Although no risk and effect correlation was carried out in our study, nevertheless this study provides a unique insight into the different risk factors for incidence of incisional hernia in our institution upon which future studies can be based.

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