

The Study of Diagnosis, Clinical Features and Management of Incisional Hernias

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Abstract

Background and Aim: This study examines the different causes, ways it presents, treatment options, and outcomes associated with an incisional hernia, which is a frequent complication of abdominal surgery and a significant contributor to patient suffering. Repair techniques may include anatomical approaches, the use of mesh, or laparoscopic methods.

Methods: Upon admission, a comprehensive medical history was obtained from each patient, focusing on various aspects. In cases where patients with incisional hernia presented with intestinal obstruction in the emergency department, initial resuscitation was performed. The choice of surgical repair method depended on the size of the defect. For defects measuring 3 cm or less, the anatomical repair was performed, while defects larger than 3 cm were treated with only prolene mesh repair.

Results: The most frequently reported symptom among the patients in this study was swelling, experienced by 67.5% of the participants. Pain was another common symptom, reported by 37.5% of the patients. In the present study, it was observed that 34 patients (68%) had a hernial defect larger than 3cm, while n=16 patients (32%) had a defect measuring 3 cm or smaller. Prolene mesh repair was conducted in 27 cases (67.5%), while anatomical repair using suturing was performed in 13 cases (32.5%).

Conclusion: In this study, we found incisional hernias are more commonly observed in males compared to females. The most common risk factor for developing an incisional hernia in the postoperative period is wound infection. To minimize the risk of incisional hernia formation, the use of lower midline incisions should be limited whenever possible, as they are more prone to herniation.

Keywords: Incisional Hernia, Mesh Repair, Anatomical Repair.

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Introduction

An incisional hernia refers to the protrusion of abdominal organs through a previous surgical incision or traumatic wound on the abdominal wall, excluding the hernia site itself. [1] Despite advancements in surgical techniques,

anesthesia, antibiotics, and suture materials, the incidence of incisional hernia remains significant, with at least a 10% occurrence rate. It is the second most common type of hernia after inguinal hernia. [2, 3] The actual incidence may be higher than reported since many cases are

asymptomatic. Abdominal incisions differ from other types of incisions in that the abdominal wall is subjected to varying pressure from internal organs. Therefore, it is preferable to use incisions that are more physiological and cause fewer anatomical distortions. Among abdominal incisions, lower abdominal incisions have the highest incidence of incisional hernia. This is particularly relevant in gynecological operations, as they are commonly performed through this type of incision. [4] The lower abdomen experiences greater pressure compared to the upper abdomen, and the posterior rectus sheath is weaker below the umbilicus. The stress and strain on the lower abdomen make it more susceptible to herniation. Several methods are available for repairing abdominal incisional hernias. Small defects can be repaired using simple re-suturing. Other techniques such as shoelace darn repair, Cattell's repair, and Maingot's keel repair have gained popularity. [5] However, these anatomical repairs are associated with recurrence rates ranging from 15 to 20 percent. [6] Polymer chemistry has revolutionized the field of suture materials, introducing nylon, polymer, polyester, polypropylene, polytetrafluoroethylene (PTFE), polyglactyl, and polydioxanone. Prosthetic grafts have also revolutionized various surgical fields. The use of prosthetic mesh for hernia repair dates back to 1958 when Usher reported his experience with polypropylene (prolene) mesh, marking the beginning of the modern era of prosthetic hernia repair. [7]

Ever since the widespread adoption of polypropylene mesh, it has become a commonly used method to effectively cover large defects in incisional hernia, yielding excellent outcomes. Despite numerous recent surgical advancements, incisional hernia remains a significant occurrence, posing management challenges. Many cases of incisional hernia present with extensive defects

resulting from post-operative wound infections. Some patients have previously undergone anatomical repairs, leading to wider defects and scarring. To prevent further recurrences, the utilization of prolene mesh has become necessary. Consequently, a study was conducted to evaluate the outcomes of repair using prolene mesh and anatomical repair in incisional hernia cases. The primary objective of this dissertation is to investigate various risk factors and the management of incisional hernias.

Material and Methods

This cross-sectional study was conducted in the Department of General Surgery, Sri Venkateswara Institute of Medical Sciences (SVIMS) Tirupati, Andhra Pradesh. Institutional Ethical permission was obtained for the study as per the requirements for human studies. Written consent was obtained from all the patients of the study after explaining the nature of the study in the vernacular language.

Inclusion criteria

1. All the cases were diagnosed with incisional hernias.
2. Aged 18 and above.
3. Males and females
4. Willing to participate in the study voluntarily.

Exclusion criteria

1. Patients with co-morbidities such as malignancy, and respiratory diseases.
2. Patients with chronic cough and end-stage liver disease.
3. Patients who were not fit for the surgery.

Upon admission, a comprehensive medical history was obtained from each patient, focusing on various aspects. This included gathering information on the timing and duration of the swelling following the initial surgery, any associated pain, indications of previous abdominal surgeries, and a detailed account of postoperative complications during that

time, such as wound infections or wound dehiscence. Additionally, specific inquiries were made regarding coughing, constipation, symptoms of prostatism (in males), steroid therapy, and smoking status. The patient's height and weight were measured to calculate their Body Mass Index (BMI). Furthermore, their medications, past medical history, and presence of chronic medical conditions (such as diabetes, hypertension, or tuberculosis) were documented, along with any known drug allergies or alcohol consumption. In cases where patients with incisional hernia presented with intestinal obstruction in the emergency department, initial resuscitation was performed. Once they achieved hemodynamic stability, they were transferred for radiological procedures and subsequently admitted to the surgical ward. Essential laboratory investigations, including a complete blood count, blood sugar level, HIV and Hepatitis B status, and urine analysis, were conducted as part of the diagnostic process. Before surgery, informed written consent was obtained from the patient and their relatives.

The choice of surgical repair method depended on the size of the defect. For defects measuring 3cm or less, the anatomical repair was performed, while

defects larger than 3cm were treated with onlay prolene mesh repair. Upon discharge, patients were advised to refrain from lifting heavy weights for a duration of six weeks to ensure proper healing and recovery. Regular follow-up appointments were made on the 7th day following discharge and 15 days for the first 3 months and monthly for the next 6 months.

Statistical analysis: The collected data were recorded in MS Excel sheets and analyzed using the statistical package for social sciences (SPSS, version 21) in Windows format. Continuous variables were represented as mean, standard deviations, and percentages, and categorical variables were analyzed by chi-square test and represented as p values, and the p-values of (<0.05) were considered significant.

Results

In this study out of n=40 cases n=32(80%) were males and n=8(20%) were females the male-to-female ratio was 4:1. The distribution of cases in the study revealed 25% were in the age group of 21 – 30 years followed by 20% in the age group of 31 – 40 years depicted in table 1. The mean age of the cohort was 32.5 ± 6.5 years.

Table 1: Showing the distribution of cases in the study.

Age in years	Frequency		Total	Percentage
	Male	Female		
18 – 20	2	1	3	7.5
21 – 30	10	0	10	25.0
31 – 40	8	0	8	20.0
41 – 50	3	2	5	12.5
51 – 60	5	2	7	17.5
61 – 70	4	3	7	17.5
Total	32	8	40	100

In most cases, 70% of the patients (n=28) experienced swelling on the anterior abdominal wall following previous surgery. In 30% of the cases (n=12), patients reported both pain and swelling. Upon admission, a significant number of patients, 90% (n=36), had a reducible hernia, while 10% (n=4) presented with an irreducible hernia (figure 1).

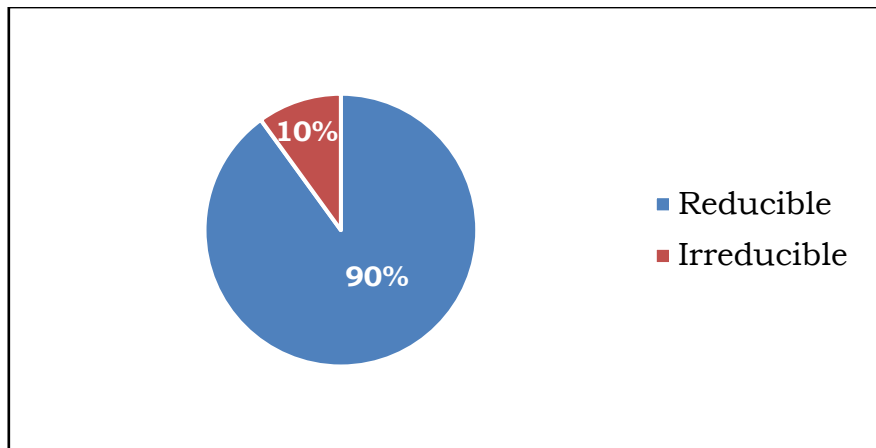


Figure 1: Showing the distribution of cases according to the reducibility of hernia.

According to this series, 40% of the patients are classified as manual workers or laborers. There is a general belief that engaging in activities involving severe straining and heavy lifting increases the

likelihood of developing an incisional hernia. This notion is supported by studies such as the one conducted by Zimmerman HC and Ansonm, which emphasizes the influence of intrabdominal pressure.

Table 2: Showing the distribution of cases according to the symptoms.

Symptoms	Number of Cases	Percentage
Swelling	27	67.5
Pain	15	37.5
Other Complaints	4	10.0

The most frequently reported symptom among the patients in this study was swelling, experienced by 67.5% of the participants. Pain was another common symptom, reported by 37.5% of the patients. The swelling was visibly noticeable when standing or exerting oneself. The pain was described as

intermittent colicky and indicated the presence of adhesions. Among the predisposing factors, multiparity (having multiple pregnancies), obesity, and anemia were the most commonly observed. Chronic bronchitis, asthma, diabetes, and other conditions were less frequently identified as contributing factors (table 2).

Table 3: Size of the defects as detected by ultrasonography in the cases.

Size of defect on USG in centimeters	Frequency	Percentage
2.0	1	2.5
2.5	3	7.5
3.0	10	25.0
5.0	23	57.5
8.0	1	2.5
10.0	1	2.5
> 10.0	1	2.5

In the present study, it was observed that 34 patients (68%) had a hernial defect larger than 3cm, while n=16 patients

(32%) had a defect measuring 3cm or smaller (table 3). The size of the defect played a crucial role in determining the

type of repair performed in this study. Prolene mesh repair was conducted in 27 cases (67.5%), while anatomical repair

using suturing was performed in 13 cases (12.5%).

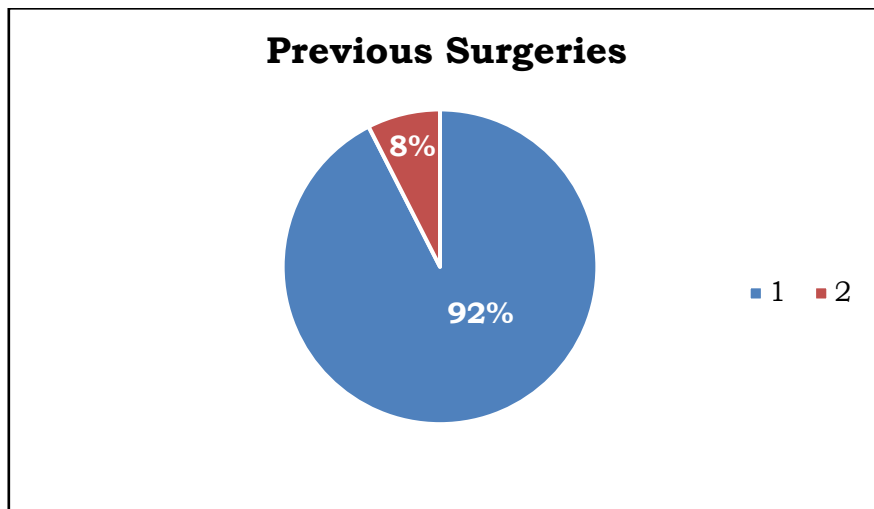


Figure 2: History of previous surgeries in the cases of hernia

History of previous surgeries in the cases of hernia has shown that 92% of cases had one surgery done previously and 8% had undergone 2 surgeries in the cases of hernia (Figure 2).

Table 4: Postoperative complications recorded in the cases of the study.

Complications	Frequency	Percentage
Wound infection	4	10
Wound disruption	1	2.5
Postoperative cough	2	5
Postoperative distension	2	5

All the complications in the study were reported in the cases repaired with prolene mesh repair. Because prolene is a foreign material it tends to generate tissue response more often as compared to anatomical suture repairs. Out of which common was wound infection in 10% of all cases followed by postoperative cough and postoperative distension in 5% of cases each and wound disruption in 2.5% of cases depicted in Table 4.

Discussion

In our study, the most commonly affected age group was found to be between 31 to 50 years. These findings are consistent with the studies conducted by Akruwala SD et al., [8] Saeed KA et al., [9] and Rasool M et al., [10] as referenced in the references. Furthermore, in our study, there was a notable gender disparity, with

a female-to-male ratio of 4.5:1. This observation aligns with the findings of various other similar studies. [8-12] The higher proportion of females in our study may be attributed to the impact of multiple childbirths, which can weaken the abdominal wall and increase the likelihood of developing an incisional hernia. In the present study, the majority of patients exhibited abdominal swelling in the area around their previous surgical scar. This finding is consistent with the study conducted by Kondreddy S et al., [13]. Moreover, in our study, a significant proportion of the incisional hernias occurred following lower midline incisions. These findings are consistent with the findings of various other studies. [14- 16] The higher incidence of incisional hernias in lower midline incisions may be attributed to the absence of the posterior

rectus sheath below the arcuate line in the lower abdomen. This absence weakens the abdominal wall in that region. Additionally, the intraabdominal hydrostatic pressure is higher in the lower abdomen (around 20 cm of water) compared to the upper abdomen (around 8 cm of water) in an upright position.

Out of the n=40 patients, n=27 cases were chosen for prolene mesh repair based on specific criteria, including wider defects, predisposing factors, and recurrence after anatomical repair. The remaining cases underwent anatomical repairs. Before the surgery, obese patients were advised to reduce their weight, and abdominal exercises were recommended to increase the tone of the abdominal muscles. Diabetic patients were managed with insulin to control their blood sugar levels. Hypertension was also controlled, and any chest infections were treated before the operation. Nutritional deficiencies and anemia were addressed, and all necessary pre-operative investigations were conducted. The selected cases underwent Onlay prolene mesh placement during the surgical procedure. The abdominal area was closed using Redivac drains. A Foley's catheter was inserted to decompress the bladder throughout the operation and was subsequently removed on the second day. Postoperatively, nasogastric aspiration was performed for 24 hours to alleviate any gastric discomfort. Broad-spectrum antibiotics were administered to prevent infection. The drains inserted during the surgery were typically removed on the 4th or 5th day. Sutures were removed on the 10th day. In cases where wound infections occurred, appropriate drainage and antibiotics were employed for treatment. Seromas (accumulation of fluid) were also drained as necessary. Notably, there were no instances of mesh rejection, and wound healing was ultimately successful in all cases. While the rate of wound infections was higher in mesh repairs compared to anatomical repairs, the infections were

effectively controlled. This observation is similar to the observation by Maatouk M et al., [17] they found mesh repair compared to suture repair is not associated with increased incidence of SSI even in potentially contaminated areas. Additionally, there were no cases of mesh rejection or hernia recurrence observed. Patients were discharged with instructions to avoid strenuous activities. Overall, the outcomes of prolene mesh repair were deemed excellent, with positive results in terms of wound healing and hernia recurrence prevention, despite the higher infection rate compared to anatomical repair. The only potential drawback mentioned was the cost associated with mesh repair.

Conclusion

In this study, we found incisional hernias are more commonly observed in males compared to females. The most common risk factor for developing an incisional hernia in the postoperative period is wound infection. To minimize the risk of incisional hernia formation, the use of lower midline incisions should be limited whenever possible, as they are more prone to herniation. Adequate preoperative preparation of high-risk patients, such as those with diabetes mellitus, chronic obstructive pulmonary disease (COPD), and obesity, is crucial in preventing the recurrence of incisional hernias.

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