

# A Clinical Study of Incisional Hernia

Sudhir Dnyandeo Bhamre<sup>1\*</sup> and Nitin Devidas Pingale<sup>2</sup>

<sup>1</sup>Professor & Head, Department of Surgery, Dr. Vasant Rao Pawar Medical College, Hospital and Research Centre, Adgaon, Nashik - 422203, Maharashtra, India; sudhir\_bhamre@yahoo.com

<sup>2</sup>PG Resident, Department of Surgery, Dr. Vasant Rao Pawar Medical College, Hospital and Research Centre, Adgaon, Nashik - 422203, Maharashtra, India

## Abstract

**Background:** Incisional Hernias are common complication of abdominal surgery. Depending on the risk factors Incisional Hernia can occur in 10 – 20 % of patients subjected to abdominal operations. **Aims and Objective:** A clinical study on risk factors, clinical presentations, management and post operative complications in patient with Incisional Hernia. **Setting:** Department of Surgery of a Tertiary Health Care Centre with an attached medical college. **Material and Methods:** A total of 43 patients of Incisional Hernia were studied and postoperative complications were evaluated in our institute. **Results:** Incidence of incisional hernia is more common in females than males and the overall M:F ratio is 1:2, 55.9 % of patients presented with swelling and pain. Incisional hernia incidence is high in lower abdominal incisions. **Conclusions:** The use of midline incision should be restricted to operations in which unlimited access to the abdominal cavity is necessary. Use of suction drain reduces post-operative complication

**Keywords:** Incisional Hernia, Hernia, Ventral Hernia

## 1. Introduction

Incisional hernia has followed abdominal surgery like a shadow for more than a century now. Incisional hernia is the one true iatrogenic hernia. Ian Aird defines incisional hernia as a diffuse extrusion of peritoneum and abdominal contents through a weak scar of an operation or accidental wound. Incisional hernia occurs in 10- 20 % of patients subjected to abdominal operations<sup>1,2</sup>. Many factors are associated with incisional hernia like age, sex, obesity, chest infections, type of suture material used and most important wound infection<sup>1</sup>. All these present a challenging problem to the surgeon.

Incisional hernia usually starts early after surgery, as a result of failure of the lines of closure of the abdominal wall following laparotomy. If left unattended they tend to attain large size and cause discomfort to the patient or may lead to strangulation of abdominal contents. Further more, an incisional hernia can incarcerate, obstruct, perforate or can cause skin necrosis all of which markedly increase the risk to patient's life.

With the advent of anesthesia, antisepsis, antibiotics and greater understanding of anatomy, the scientific approach to hernial treatment dawned. Currently by the judicious use of the above three concepts, incisional hernia is repaired with least morbidity, mortality and recurrence rates. Almost every surgeon has got his own techniques and may modify it to suit the situation.

Laparoscopic technique of hernia repair has revolutionized the treatment of incisional hernia repair by reducing the morbidity and less hospital stay to the patient. This study has been undertaken to assess the magnitude of this problem, various factors leading to development of this condition and the different modalities of treatment practiced in our set up.

## 2. Aim and Objective

1. To study various precipitating factors of incisional hernia.
2. To study various clinical presentation of incisional hernia.

\*Author for correspondence

- To study management and early postoperative complications of incisional hernia.

### 3. Materials and Methodology

The present study is a hospital based Prospective, Observational study. This study was performed in the Department of Surgery of Medical College and Tertiary Health Care Centre from August 2012 till December 2014.

#### 3.1 Study Participants

- Sample Population – The study included a total of 43 patients who fulfilled the inclusion and exclusion criteria. Once diagnosed with incisional hernia, they were subjected to a detailed clinical examination and appropriate investigations.
- Sampling Technique - Consecutive type of non-probability sampling was employed for selection of study subjects. Final sample size taken 43.

#### 3.2 Eligibility Criteria

Inclusion criteria:-

- Pain and Discomfort at the site of swelling.
- Large Hernia with small opening and risk of strangulation.
- History of irreducibility, recurrent sub-acute intestinal obstruction, incarceration.
- Willing for cosmetic purposes.

Exclusion criteria included:-

- Uncorrected extreme obesity.
- Skin infection.
- Ascites due to Cirrhosis, Heart Failure, Portal Hypertension, Pancreatic Cancer, Hepatitis, uremia.
- Bed ridden patient with wide defect.

A total of 43 patients were included in the present study after satisfying inclusion and exclusion criteria. Written informed consent was taken after explaining in local language with best of their satisfaction. Detailed clinical history and examination findings will be entered in pre-designed pro-forma (Annexure). Following investigation findings will be noted in the pre-designed pro-forma.

A detailed history of all patients was taken and a thorough clinical examination was done after written and informed consent of the patients. All patients were

analyzed in various aspects like age, sex, risk factors, and mode of presentation, previous operation and site of previous scar. Patients were also evaluated for other risk factors like obesity, HTN, DM and malignant disease.

Routine investigations like Blood, Urine, CXR, and ECG were done. All the cases were operated and procedure adopted was anatomical repair or mesh repair. The immediate post-operative complications were also evaluated.

### 4. Analysis and Results

In this study of 43 cases it has been found that incidence of incisional hernia is more common in females than males and the overall M:F ratio is 1:2 (approx.) ( Table 1 & Figure 1).

From the above table it is learnt that the incidence of incisional hernia is maximum in the age group of 40-70 years (63%). In this study the youngest patient was 22 years and the oldest was 75 years (Table 2).

In our study 19 patients (44.1%) presented with only abdominal swelling, 24patients (55.9%) presented with abdominal swelling and pain in abdomen (Table 3, Figure 2).

**Table 1.** Distribution of patients according to sex

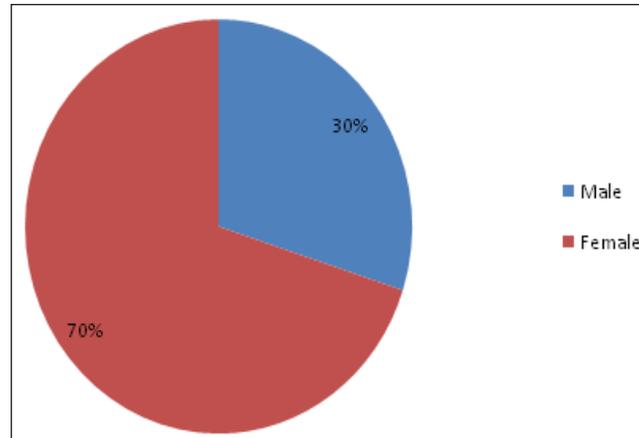
Total no. of patients	43	% age
Male	13	30%
Female	30	70%

**Table 2.** Age Incidence

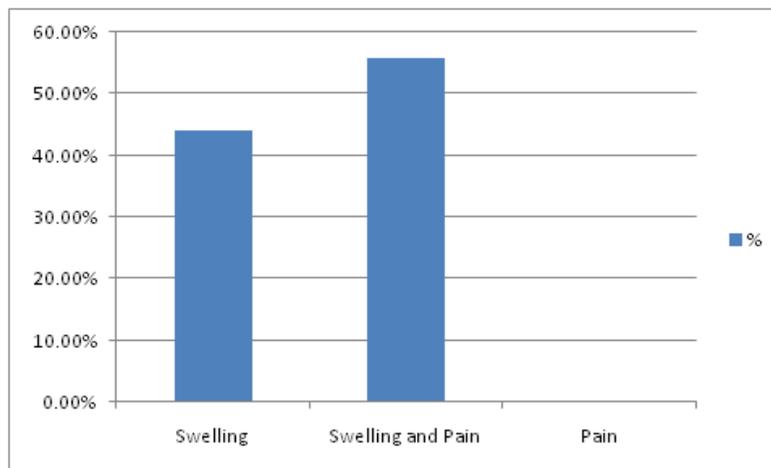
Age group	No. of cases	Percentage
11-20	00	00%
21-30	04	9.3%
31-40	07	16.2%
41-50	08	18.6%
51-60	10	23.2%
61-70	09	20.9%
71-80	05	11.6%

**Table 3.** Mode of Presentation

Mode of Presentation	No. of cases	Percentage
Swelling	19	44.1%
Swelling and Pain	24	55.9%
Pain	00	00.0%



**Figure 1.** Gender distribution of incisional hernia in study population.



**Figure 2.** Symptoms in incisional hernia patients.

**Table 4.** Previous Surgeries

Name of the operation	No. of patients
Hysterectomy	11
L.S.C.S.	05
Tubal Ligation	06
DU perforation closure	04
Laparoscopy	02
Exploratory laparotomy	08
Appendectomy	02
Herniorrhaphy	05

4 patients had hernial defect which measured up to 2 cm. 14 patients had defects between 2 - 4 cm. 16 patients had defects between 4 - 6 cm, while 9 patients had defect more than 6 cm.

From the above table, it is found that in our study 51.1% of patients had undergone gynecological procedures

**Table 5.** Previous Incision used

Incision	No. of cases
Lowermidline	18
Uppermidline	02
Para-median	03
Transverse	05
Oblique/Lumbar	05
MidLine	10

with lower midline incision. Among which Hysterectomy was the most common operation followed by Tubal Ligation. The GI surgeries account for 32.5% which includes exploratory laparotomy for DU perforation, Peritonitis, Abdominal Trauma, Hydatid Cyst (Table 4).

The patients had previous operations using lower midline abdominal incisions in 41.8%, Midline incisions in 23.2%. Other incisions were Upper Midline, Transverse,

**Table 6.** Risk Factors

Risk factors	No. Of patients
Wound infection	12
Wound dehiscence	02
Post-operative Cough	00
Repeat surgery	00
Respiratory complications	01
No complications	22
Obesity	02
Diabetes Mellitus	01
BEP	03
Constipation	01

**Table 7.** Time of onset of hernia after the previous surgery

Duration since surgery	No. Of patients
0-3 months	09
3 months to 1 year	13
1-3 years	07
> 3 years	14

Para-median, and Oblique Lumbar, which led to the incidence of incisional hernia (Table 5).

In our study 23 patients had previous post-operative complications in the form of wound infection (12 patients) and wound dehiscence (2 patients). The other risk factors were BEP (3 patient), Obesity (2 patients), COPD (1 patients) and Constipation (1 Patient). 22 patients had no complications following previous surgery. None of the patients had other risk factor like malnutrition, generalized wasting, malignant disease, patients on steroid therapy (Table 6).

From the above data it is found that in our study 9 patients (20.9%) presented with incisional hernia within 3 months of the previous surgery, 13 patients (30.2%) noticed swelling at the operated site within 3 months to one year of surgery and 7 patients (16.2%) within 1-3 years of surgery i.e., nearly 67.3% of them developed incisional hernia within 3 years of surgery. Remaining 14 patients (32.55%) developed hernia after 3 years (Table 7).

**Drains:** In majority of the patients closed suction drains were used and brought out through separate incision.

In our study, 4 patients had wound infection, which was equally present in patient with anatomical repair and mesh repair and was treated with antibiotics according

**Table 8.** Anatomical Versus Mesh Repair

Type of repair	No. of patients
Anatomical Repair	08
Mesh Repair	
Onlay	34
Underlay	01

8 patients underwent Anatomical Repair compared to 35 patients who underwent Mesh Repair.

to culture and sensitivity reports. 3 patients had seroma formation, which was seen in mesh repair patients only and was treated by drainage and dressings. There was no surgery related mortality in this study (Table 8).

## 5. Discussion

43 cases of Incisional Hernia admitted for treatment from August 2012 - December 2014 are presented in this dissertation. This study may not reflect all the aspects of incisional hernia, as the series is small and follow up has been for a short period in most of the cases.

The maximum age incidence of incisional hernia in our study has been 50-60 years. Ellis, Gajraj and George<sup>3</sup> in their study noticed a mean age of 49.4 years. The youngest patient in our study was 22 years and the oldest was 75 years.

The sex incidence of incisional hernia among the 43 cases studied is 1:2 (M:F) approximately showing a female preponderance. This is because of laxity of abdominal muscles due to multiple pregnancies and also an increased incidence of obesity in females. Ellis, Gajraj and George<sup>3</sup> obtained an incidence of 64.6% female population in their study of 383 patients. J.B.Shah<sup>4</sup> studies and Goel and Dubey<sup>5</sup> series have male to female ratio 1:1.17 and 1:1.25(M:F) ratios respectively.

Maximum patients presented with abdominal swelling and pain (55.5%). While other patient presented only with swelling over abdomen (44.1%).

In our study 41.8% of the incisional hernia occurred over lower midline incisions. This may be because of the following features:

- Intra-abdominal hydrostatic pressure is higher in lower abdomen compared to 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 in gynecological surgeries who have poor abdominal wall musculature.

This is comparable with A.B. Thakore et al studies (67.1%) and Goel and Dubey<sup>5</sup> studies (44.6%).

Over 53% of cases occurred following gynaecological procedures (Hysterectomy, Tubal Ligation, Caesarean sections). This may be because most of these procedures were done through lower midline incisions. Ponka<sup>6</sup> in his study noted 36% incidence and Goel and Dubey noted 28.76% incidence among gynaecological procedures.

In considering the risk factors promoting incisional hernias, wound infection accounted for 28% in our study. The other risk factors observed were BEP (7%) obesity and wound dehiscence (5%). This is comparable with that of Bose et al studies in which wound infection (59 out of 110 patients-53.63%), obesity (33/110-30%), COPD (23/110 - 20.90%). 3 patients (7%) had undergone more than one operation previously which is also one of the risk factors in our study which can be compared with Ponka<sup>4</sup> series (25%). Brenden Devlin<sup>7</sup> states that repeated wounds in the same region or just parallel to each other will often lead to the development of herniation.

In our study 51.1% of patients developed incisional hernia within 1 year of previous surgery, 16.2% within 1-3 years and 32.5% after 3 years. In Akman's series more than 65% of the incisional hernias occurred within 1 year after previous surgery.

During the clinical examination in our study 39 patients (90.0%) were found to have hernial defect of more than 2 cm and 4 patients had defects up to 2 cm. Thomas A. Santora et al.<sup>8</sup> believes that the size of the fascial defect and the appearance of the fascia should dictate the selection of the most appropriate method of hernia repair. Jack Abrahamson<sup>9</sup> believes that mesh repair is excellent method of repair for large ventral abdominal hernias but has not specified the size of the defect.

A systematic review found that hernia repair without prosthetic mesh is associated with unsatisfactory recurrence rates of 12-54 %, whereas hernia repair with mesh results in recurrence rates of 2-36 %. It is now accepted that only the smallest (less than 3 cm) incisional hernia should be repaired by primary tissue approximation with sutures<sup>10</sup>. A population based study of 10 882 patients in the US found an increase in the frequency of synthetic mesh use from 35% in 1987 to 65% by 1999.<sup>10,11</sup>

In our study polypropylene mesh and the suture material of the same type was used to repair the incisional hernias and the technique of the repair was decided by the size of the hernial defect, abdominal muscle tone, whether hernial defect could be approximated without tension and general condition of the patient. 35 out of 43 were treated with polypropylene mesh repair and 8 with anatomical repair. Wound Infection occurred in 4 patients (MR-2, AR-2), while 3 patient had seroma after mesh repair.

In our study we had no recurrences, however the follow-up period was variable and short to comment upon. Usher<sup>12</sup> reported zero percent recurrence in 48 patients who were treated by polypropylene mesh repair. Jacobus W.A et al.<sup>13</sup> reported a 10 year cumulative rate of recurrence of 63% in anatomical repair and 32% in mesh repair. The recurrence rate thus varies in different studies but all studies favor mesh repair to decrease the recurrence rate.

With thorough patient evaluation, pre-operative skin preparation, meticulous operative technique, use of non-absorbable sutures for musculo- aponeurotic tissue, use of suction drain, use of peri-operative broad spectrum antibiotics, nasogastric aspiration, early ambulation and chest physiotherapy, complication rates in our study were minimized.

With prosthetic mesh, defects of any size can be repaired without tension. The polypropylene mesh, by inducing inflammatory response sets up scaffolding that in turn induces the synthesis of collagen.

Thus the superiority of mesh repair over suture repair can be accounted for.

## 6. Summary

43 cases of incisional hernia, which were admitted in our instituted and were studied. The statistical data and analysis of the cases studied for incisional hernia during this period are presented in this study.

- It was more common in females than in males with a ratio of approximately 2:1 respectively.
- Incidence of incisional hernia was highest in the age group ranging from 50-60 years.
- Most of the patients presented with swelling with pain (55.9%) and swelling (44.1%).
- Incisional hernia was more common in patients with previous history of gynaecological operations (53.0%).

- The incisional hernia was more common in the infra-umbilical region (41.8%).
- In majority of patients (67.3%) the incisional hernia occurred within 3 years of previous operation.
- Decrease muscle tone following previous surgery was the most important risk factor followed by wound infection. The other major risk factors were BEP, obesity and COPD.
- The size of the hernial defect more than 2 cm was found in 39 patients (90.0%).
- 35 patients (81.4%) underwent mesh repair and 7 patients had post-operative complications, wound infection being the commonest.
- Post-operative complications included wound infection (10.0%), seroma (7.0%)
- Post-operative complications were minimized by the use of closed suction drains.
- There was no recurrence in our study though the period of follow-up was not adequate to make correct assessment of recurrence.

## 7. Conclusion

- The use of midline incision should be restricted to operations in which unlimited access to the abdominal cavity is necessary.
- Meticulous aseptic technique and careful closure of the abdominal wound is necessary to prevent incisional hernia.
- Proper preoperative preparation of the patients with high risk is an important factor in preventing recurrence of incisional hernia.
- Use of suction drains in mesh repair decreases the postoperative complications.

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