

Research Article

# A Prospective Observational Study of Abdominal Wall Hernias and Its Management in a Tertiary Care Hospital

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## ABSTRACT

**Introduction:** Abdominal wall hernia is a common surgical condition affecting all ages and both sexes. It is an abnormal protrusion of a peritoneal lined sac through the muscular covering of the abdomen. The clinical manifestations range from small incidentally found defects to giant and complicated hernias with loss of abdominal domain. Symptoms range from none or few to severe pain and life-threatening conditions.

**Materials and Methods:** A prospective observational study was conducted in Department of General Surgery, ACSR Govt Medical College, Nellore and Andhra Pradesh over a period from September 2023 to August 2024 with 102 patients included in the study. Patients with age >15 years who had herniation at site of previous surgical scar were chosen for the study. Observations were made with regard to duration and ease of operation, wound complications, mesh infections, hospital stay, morbidity and recurrence. Diagnosis was made with clinical examination, USG abdomen and X-ray abdomen. All the patients were assessed preoperatively, intra-operatively and post-operatively, and the findings were recorded in a pre-structured proforma.

**Results:** 56 males and 46 females were included. The mean age was 42.3 years. Most common cause of IH was post-operative wound infection (47.1%). Maximum cases were following emergency surgery (88.2%). Midline incision contributes maximum number (52.9%) followed by Pfannenstiel incision (25.4%). Open hernioplasty was the most common procedure (58.8%) followed by anatomical repair (19.6%) and laparoscopic hernioplasty (15.6%). Recurrence with suture repair was 10%, open mesh repair 3.3% and no recurrence was observed following laparoscopic repair.

**Conclusion:** Prevention of IH is to be taken care of, by avoiding infection during index operation with thorough peritoneal toileting, proper surgical techniques and appropriate antibiotics. Although laparoscopic mesh repair needs more operating time and skill, it has lesser blood loss, hospital stay and recurrence rate when compared to other procedures.

**Keywords:** Abdominal Wall Hernia, Severe Pain, Laparoscopic Mesh Repair, Laparoscopic Hernioplasty.

## INTRODUCTION

Abdominal wall hernia is a common surgical condition affecting all ages and both sexes. It is an abnormal protrusion of a peritoneal lined sac through the muscular covering of the abdomen.<sup>1</sup>

The clinical manifestations range from small incidentally found defects to giant and complicated hernias with loss of abdominal domain. Symptoms range from none or few to severe pain and life-threatening conditions.<sup>2</sup>

Most common ventral hernias are incisional and para-umbilical hernias which account for 85% of the overall ventral abdominal hernias. Incisional hernias are estimated to occur in 11-20% of laparotomy incisions. An increasing interest in laparoscopic surgery and the availability of newer materials have encouraged the adoption of laparoscopic ventral hernia repair (LVHR).<sup>3</sup>

A fresh evaluation of various surgical techniques of ventral hernias is required because the advent of newer techniques and

prosthetic materials may have, at least partly, rendered previous studies somewhat outdated, and possibly misleading.<sup>4</sup>

Management of abdominal wall hernia comes under two headings preventive and operative. Preventive aspects include proper choice of incision, avoidance of tension on suture line, preservation of nerves and proper closure of the abdominal wounds. Operative management consists of anatomical reconstruction layer by layer, reconstruction of various layers of the abdominal walls, darning technique, usage of implants, and repair with synthetic non-absorbable mesh. Abdominal wall hernia repairs can be done using either open or laparoscopic techniques; laparoscopic gaining more popularity. The open technique may consist of a simple hernioplasty, component separation technique or mesh repair. The component separation technique is based on enlargement of the abdominal wall surface by separation and advancement of the muscular layers. The mesh can be placed using on-lay, sub-lay or inlay techniques.<sup>5</sup>

## MATERIALS AND METHODS

A prospective observational study was conducted in Department of General Surgery, ACSR Govt Medical College, Nellore and Andhra Pradesh over a period from September 2023 to August 2024 with 102 patients included in the study.

### Inclusion Criteria

Patients with age >15 years who had herniation at site of previous surgical scar were chosen for the study.

### Exclusion Criteria

Exclusion criteria were 1. Recurrent IH, 2. Complicated IH that required emergency surgery, 3. On investigation found not to have IH, 4. Those who refused to give consent for study.

Observations were made with regard to duration and ease of operation, wound complications, mesh infections, hospital stay, morbidity and recurrence. Diagnosis was made with clinical examination, USG abdomen and X-ray abdomen. All the patients were assessed preoperatively, intra-operatively and post-operatively, and the findings were recorded in a pre-structured proforma. Patients were evaluated in terms of age, gender, and Body Mass Index (BMI), mean operation time, length of hospital stay, pre-operative investigations, surgical technique, and post-operative complications. The patients underwent different surgical procedures like anatomic reconstruction, open hernioplasty or laparoscopic hernioplasty depending on size of defect, patient's consent and expertise available. Patients were followed up to 1 year and recurrence was observed.

### Statistical Analysis

Descriptive statistics were expressed as means and standard deviations.

## RESULTS

Table 1: Gender Distribution

| S.No | Gender | No of cases (N=102) | Percentage |
|------|--------|---------------------|------------|
| 1    | Male   | 56                  | 54.9       |
| 2    | Female | 46                  | 45.1       |

56 cases affected with IH were males accounting to 54.9% cases. 46 cases out of 51 were females making about 45.1% of cases of

IH. Male preponderance i.e. male: Female ratio being 1.2:1 was seen in the study (Table 1).

Table 2: Distribution of Cases According to BMI

| S.No | BMI                  | No of cases (N=102) | Percentage |
|------|----------------------|---------------------|------------|
| 1    | <18 (underweight)    | 8                   | 7.8        |
| 2    | 18-24.9 (normal)     | 36                  | 35.3       |
| 3    | 25-29.9 (overweight) | 38                  | 37.3       |
| 4    | >30 (obese)          | 20                  | 19.6       |

Majority of the patients with IH came under overweight group with BMI of 25-29.9 kg/m<sup>2</sup> i.e., 38 out of 102 cases (37.3%). Only 35.3%

patients came under normal group with BMI of 18-24.9 kg/m<sup>2</sup>. The number of cases with BMI <18 kg/m<sup>2</sup> and >30 kg/m<sup>2</sup> were 4 (7.8%) and

10 (19.6%) respectively. The mean BMI of patients with IH was 25.9 kg/m<sup>2</sup>(Table 2).

Table 3: Distribution of IH According to Type of Previous Incision

| S.No | Type of incision       | No of cases (N=102) | Percentage |
|------|------------------------|---------------------|------------|
| 1    | Midline incision       | 54                  | 52.9       |
| 2    | Pfannenstiel incision  | 26                  | 25.4       |
| 3    | Subcostal incision     | 4                   | 3.9        |
| 4    | McBurney's incision    | 4                   | 3.9        |
| 5    | Laparoscopic port site | 6                   | 5.9        |
| 6    | Other incision         | 8                   | 7.8        |

Table 4: Distribution of IH According to Type of Previous Surgery

| S.No | Type of previous surgery | No of cases (N=102) | Percentage |
|------|--------------------------|---------------------|------------|
| 1    | Emergency                | 90                  | 88.2%      |
| 2    | Elective                 | 12                  | 11.8%      |

Previous emergency surgery lead to 45 out of 51 number of IH cases making share of previous emergency surgery about 88.2% in incidence of IH. Only 12 out of 102 cases occurred after elective surgery which amounted to 11.8% of IH cases (Table 4).

Table 5: Distribution of IH According to Type of Pathology

| S.No | Pathology            | Incision                  | No of patients | Percentage |
|------|----------------------|---------------------------|----------------|------------|
| 1    | Duodenal perforation | Midline                   | 28             | 27.4       |
| 2    | Volvulus             | Midline                   | 10             | 9.8        |
| 3    | Malignancy           | Midline                   | 16             | 15.6       |
| 4    | Caesarean section    | Pfannenstiel incision     | 26             | 25.4       |
| 5    | Open cholecystectomy | Subcostal                 | 6              | 3.9        |
| 6    | Open appendectomy    | McBurney's                | 6              | 3.9        |
| 7    | Lap cholecystectomy  | Laparoscopic port site    | 6              | 3.9        |
| 8    | Lap appendectomy     | Laparoscopic port site    | 2              | 1.9        |
| 9    | Iliopsoas abscess    | Posterolateral transverse | 4              | 3.9        |
| 10   | Whipple procedure    | B/L subcostal             | 4              | 3.9        |

Table 6: Distribution of IH According to Type of Management

| S.No | Type of management             | Number of cases | Percentage |
|------|--------------------------------|-----------------|------------|
| 1    | Suture repair                  | 20              | 19.6       |
| 2    | Open Mesh hernioplasty         | 60              | 58.8       |
| 3    | Laparoscopic mesh hernioplasty | 16              | 15.6       |
| 4    | None                           | 6               | 5.8        |

## DISCUSSION

Abdominal incisional hernia is very common clinically with an incidence of 3% to 20.6%. Infection of the incision will increase the rate of hernia up to 23%. Abdominal incisional hernia will lead to splitting the fascia layer and formation of abdominal wall mass for intra-abdominal tissues or organs sticking out from split, which will severely affect patient life. However, different area has different incidence. In our study conducted in a tertiary care hospital of the south India, 102 cases of IH in 2 years were found excluding the recurrent cases, complicated cases and those unwilling to be included in study.<sup>6</sup>

This study shows male preponderance with 54.9% compared to the other studies Zhang et al. Kurmann et al showed 72.5% males in laparoscopic group and 67.5% in open group. The mean age of our study is 42.3 years, 47% being between 25-45 years of age. Only about 7.8% patients were above 65 years of age. In Zhang et al the mean age of the study was 45.5. Kurmann et al showed mean age of study in the laparoscopic group is 63 and open group is 63.5 years. Roland et al studied the mean age of patients in the suture repair group is 63 and Mesh repair group is 57 years.<sup>7</sup>

Muscle fibre strength can prevent the occurrence of IH and it is mainly provided by the nutrition and proper exercise. Obesity is said to be one of the causes for IH. In this study 19.6% patients are obese and mostly are men, while 7.8% were underweight. Midline incision leads to maximum number of IH cases (52.9%) in this study and Pfannenstiel incision contributes 25.4% of the cases. Subcostal IH are generally rare, as abdominal muscles can prevent from herniation. But in this study two cases of IH were observed after subcostal incision (open cholecystectomy).<sup>8</sup> Mc Burney's incision accounts for 3.9% of IH in our study and laparoscopic port site IH occurred in 3 cases (5.9%). Purushotham et al showed 80% of IH cases after previous lower midline incision and 11.5% after upper midline incision. Mc Burney's incision also leads to 8.5% IH according to their study.<sup>9</sup>

In this study emergency surgery caused the greatest number of IH (88.2%) and elective surgery caused only 11.8% IH. Purushotham et al showed emergency surgery resulted 57% case of IH, while elective surgery in 43% cases.<sup>25</sup> Since emergency surgeries were done without preoperative preparations, it may lead to post-operative complications like wound infections, which is the most common etiology for IH.<sup>10</sup>

## CONCLUSION

Incisional hernia is one of the commonest complications of abdominal surgeries, especially when done in emergency. Most common etiology of IH in this study was previous surgery wound infections with 47.1%. Other causes are obesity, COPD, BPH and improper rest. On comparing different management techniques for IH, inlay laparoscopic mesh repair needs more operating time and skill compared to open mesh repair and suture repair. But laparoscopic repair had lesser blood loss and hospital stay in this study.

Recurrence of IH was more seen in suture repair, while it was nil in laparoscopic repairs

after one year of follow up. Prevention of IH is to be taken care of, by avoiding infection during index operation with thorough peritoneal toileting, proper surgical techniques and appropriate antibiotics. Laparoscopic mesh repair needs more operating time and skill as compared to open mesh repair and suture repair, but has a lesser blood loss, hospital stay and recurrence rate. Limitations of the study are non-randomization and short follow up.

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