ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Published by JK Welfare & Pharmascope Foundation Journal Home Page: www.ijrps.com

# Study of Incisional Hernia at a Tertiary Care Teaching Hospital

Mangesh Padamwar[1], Anupam Kakade[*1], Ajonish Kamble[1], Yashwant Lamture[1], Meenakshi Yeola[2]

[1]Department of General Surgery, Datta Meghe Medical College, Shalinitai Meghe Hospital and Research Centre (Datta Meghe Institute of Medical Sciences), Hingana, Nagpur-441110, India
[2]Department of General Surgery, Jawaharlal Nehru Medical College, (Datta Meghe Institute of Medical Sciences), Sawangi Meghe, Wardha, India

*Article History:*

Received on: 18 Mar 2020
Revised on: 18 Apr 2020
Accepted on: 19 May 2020

*Keywords:*

Incisional hernia, Open hernioplasty, Laparoscopic hernioplasty

ABSTRACT

Incisional hernia affects all age groups and involves both males and females. It can be defined as hernia, which protrudes through the surgical wound, which was healed incompletely. Incisional Hernia Management requires operative intervention most of the time. It may be corrected by laparoscopic repair with synthetic non-absorbable mesh or open anatomical repair.In partnership with Jawaharlal Nehru Medical College AVBR Hospital (Datta Meghe Institute of Medical Sciences) Sawangi (Meghe), Wardha, Maharashtra, this work was performed in the Department of General Surgery at Datta Meghe Medical College and Shalinitai Meghe Hospital and Research Centre, Hingna, Nagpur. Over a year, 59 cases of diagnosed incisional hernia were included.33 males and 26 females were included. The mean age was years. A most common cause of Incisional Hernia (IH) post-operative wound infection(49.15%). In maximum cases, history was suggestive of emergency surgery (86.44%). Open mesh hernioplasty was the common procedure (57.62%), Lap mesh hernioplasty done in (25.42%) cases, and (16.94%) cases were treated by suture repair. There was no evidence of Recurrence in laparoscopic repair as open mesh hernioplasty has a recurrence rate of 03.57%, and suture repair cases showed 33.33% recurrence.Incisional Hernia and its occurrence can be taken care of by implementing all standard aseptic precautions, thereby avoiding chances of infection at the time of primary surgery wherein thorough peritoneal wash, proper techniques of wound closure and use of appropriate antibiotics is recommended. Management of IH with Laparoscopic mesh repair has an advantage in terms of less hospital stay, negligible rate of Recurrence though it is not cost-effective in the present scenario.

*Corresponding Author

Name: Anupam Kakade
Phone: 9890959395
Email: pdrmangesh@gmail.com

ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11i2.2267

Production and Hosted by

IJRPS | www.ijrps.com



## INTRODUCTION

A protrusion of viscous or a part of viscous coming out of any normal or abnormal opening in the wall of its containing cavity is known as a hernia (Macnalty and Critchley, 1978). An abdominal incisional hernia is a common entity that comes across in general surgery practice. Incidence of incisional hernia may arise out of multiple factors like - the type of surgery, duration of surgery, disease pathology, age and patients characteristics, surgical technique, co-morbidities, and post-operative recovery. Morbidly obese patients got a higher chance of inci-

dence of IH. The use of different imaging modalities like ultrasonography (USG), computerized tomography (CT), and magnetic resonance imaging (MRI) yield a higher incidence of IH (Musella, 2001). Incision type and length also play a significant role in the incidence. Various studies were conducted to compare IH's incidence in a median incision, paramedian incision, and transverse incision. Several meta-analysis and studies show mass closure of the abdomen with continuous non-absorbable or slowly absorbable suture material is the best technique for the prevention of IH (Ceydeli *et al.*, 2005).

IH has been clinically defined as "a bulge, visible and palpable when the patient is standing, and often requiring support or repair (Sørensen, 2005). This bulge, which is located over or near the scar of a ventral abdominal wall incision and enlarges during standing, is the usual clinical presentation. With time, IH becomes larger. Symptoms will usually be aggravated by coughing or straining. During the pre-antibiotic era, the recurrence rate was quite high, and the cure rate was low. After the advent of excellent and safe anaesthesia, antibiotics, closed suction drainage, use of prosthetic mesh, transfusion facilities, a better understanding of fluid therapy, and proper care during the pre-operative and post-operative period, the cure rate is almost cent percent. Patients and surgeons realize that the wound has not healed correctly, necessitating a corrective operation. Furthermore, an incisional hernia can become incarcerated, obstructed, or strangulated and can even cause skin necrosis and perforation, all of which markedly increases the risk to the patient's life

Many risk factors are associated with the occurrence of IH, both patients related and surgeon related. Major patient-related risk factors are obesity, chronic lung diseases, type 2 DM, male gender, age, smoking, malnutrition, steroids, chemotherapy, anaemia, collagen vascular disorders, wound infections, etc., while surgeon related are wound closure methods, suture material selection, etc (Cheng *et al.*, 2007).

Management of IH comes under two headings preventive and operative. Preventive aspects include a proper choice of incision, avoidance of tension on the 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. IH repairs can be done using either open or laparoscopic procedures. The laparoscopic procedure is 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 the 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. Laparoscopic hernia repair mainly practiced today is intra-peritoneal inlay technique with the placement of mesh that is secured with a tagging device or trans-abdominal sutures (Greenall *et al.*, 1980). Totally extra-peritoneal (TEP) repair and extended view TEP are also gaining popularity.

## MATERIALS AND METHODS

In partnership with Jawaharlal Nehru Medical College AVBR Hospital (Datta Meghe Institute of Medical Sciences) Sawangi (Meghe), Wardha, Maharashtra, this work was performed in the Department of General Surgery at Datta Meghe Medical College and Shalinitai Meghe Hospital and Research Centre, Hingna, Nagpur. Over one year, 59 cases of diagnosed incisional hernia were included.

### Inclusion criteria

Patients with age >15 years who had herniation at the site of previous surgical scars 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 the study.

Observations were made about duration and ease of operation, wound complications, mesh infections, hospital stay, morbidity, and Recurrence. The diagnosis was made with clinical examination, USG abdomen, and X-ray abdomen. 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), 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 the size of the defect, patients' consent, and expertise available. Patients were followed up to 1 year, and Recurrence was observed.

**Table 1: Table showing distribution of cases according to sex**

| Sr No | Sex | No Of Patients | % |
|---|---|---|---|
| 1 | Male | 33 | 55.93 |
| 2 | Female | 26 | 44.06 |

**Table 2: Age wise distribution of patients**

| Sr No | Age Group | % |
|---|---|---|
| 1 | 15-25 yrs | 09 |
| 2 | 25-35 yrs | 16 |
| 3 | 35-45 yrs | 12 |
| 4 | 45-55 yrs | 10 |
| 5 | 55-65 yrs | 08 |
| 6 | More than 65 yrs | 04 |

**Table 3: Distribution of cases according to BMI**

| Sr No | BMI | No of Patients | % |
|---|---|---|---|
| 1 | Less than 18 (underweight) | 05 | 08.47 |
| 2 | 18 to 24.9 (normal) | 20 | 33.89 |
| 3 | 25 to 29.9 (overweight) | 23 | 38.98 |
| 4 | More than 30(obese) | 11 | 18.64 |

**Table 4: Distribution of IH according to type of previous incision**

| Sr No | Type of Incision | No of Cases | % |
|---|---|---|---|
| 1 | Midline Incision | 33 | 55.93 |
| 2 | Pfannensteils Incision | 17 | 28.81 |
| 3 | Subcostal Incision | 02 | 03.38 |
| 4 | Mc Burneys Incision | 02 | 03.38 |
| 5 | Laparoscopic Port Site | 03 | 05.08 |
| 6 | Others | 04 | 06.77 |

**Table 5: Showing distribution of IH according to etiology**

| Sr No | Etiology | % |
|---|---|---|
| 1 | Post-op Wound Infection | 49.15 |
| 2 | Obesity | 20.33 |
| 3 | Improper rest | 16.94 |
| 4 | COPD/Chronic Cough | 08.47 |
| 5 | BHP | 05.08 |

**Table 6: Showing distribution of IH according to typeof previous surgery**

| Sr No | Type of Previous Surgery | No of Cases | % |
|---|---|---|---|
| 1 | Emergency | 51 | 86.44 |
| 2 | Elective | 08 | 13.55 |

**Table 7: Showing distribution of IH according to type of pathology**

| Sr No | Pathology | Incision | No of Patients | % |
|---|---|---|---|---|
| 1 | Duodenal Perforation | Midline | 18 | 30.50 |
| 2 | Caesarean Section | Pfannenstiel incision | 15 | 25.42 |
| 3 | Malignancy | Midline | 09 | 15.25 |
| 4 | Volvulus | Midline | 07 | 11.86 |
| 5 | Open Cholecystectomy | Subcostal | 02 | 03.38 |
| 6 | Open Appendicectomy | Mc Burneys | 02 | 03.38 |
| 7 | Lap Cholecystectomy | Laparoscopic Port Site | 02 | 03.38 |
| 8 | Lap Appendicectomy | Laparoscopic Port Site | 02 | 03.38 |
| 9 | Iliopsoas Abscess | Posterolateral Transverse | 01 | 01.69 |
| 10 | Whipple Procedure | Bilat Subcostal | 01 | 01.69 |

**Table 8: Distribution of IH according to size of defect**

| Sr No | Size of Defect | % |
|---|---|---|
| 1 | More than 4 cm | 47.45 |
| 2 | Between 2 – 4 cm | 37.28 |
| 3 | Less than 2 cm | 15.25 |

**Table 9: Distribution of IH according to type of management**

| Sr No | Type of Management | No of Cases | % |
|---|---|---|---|
| 1 | Open Mesh Hernioplasty | 34 | 57.62 |
| 2 | Lap Mesh Hernioplasty | 15 | 25.42 |
| 3 | Suture Repair | 10 | 16.94 |

**Table 10: Comparison between laparoscopic repair and open mesh repair**

| Sr No | Variables | Laproscopic Repair | Open Repair |
|---|---|---|---|
| 1 | Operating Time | 120 Minutes | 90 Minuts |
| 2 | Hospital Stay | 03 Days | 07 Days |

**Table 11: Recurrence among different type of repairs**

| Sr No | Type of Repair | No of Recurrence | % |
|---|---|---|---|
| 1 | Suture Repair | 04 out of 12 | 33.33 |
| 2 | Open Mesh Hernioplasty | 01 out of 28 | 03.57 |
| 3 | Lap Mesh Hernioplasty | 00 out of 19 | 00.00 |

### Statistical analysis

Descriptive statistics were expressed as means and standard deviations.

## RESULTS AND DISCUSSION

In partnership with Jawaharlal Nehru Medical College AVBR Hospital (Datta Meghe Institute of Medical Sciences) Sawangi (Meghe), Wardha, Maharashtra, this work was performed in the Department of General Surgery at Datta Meghe Medical College and Shalinitai Meghe Hospital and Research Centre, Hingna, Nagpur. Fifty-nine (59) cases diagnosed of Incisional Hernia throughout one 1 year included.

Table 1 shows sex-wise distribution of the study population. Out of which, sixty-nine patients were included, of which 33 cases affected with IH were males accounting to 55.93% cases. Twenty-six cases were females making about 44.06% of cases of IH.

Table 2 shows the youngest patient was 19 years of age, and the oldest being 73 years of age. The maximum number of patients in the study belonged to the age group of 25 to 35 years (27.11%). Most of the study population was between 25 and 55 years (64.40%). Only 06.77% of patients were above 65 years.

Table 3 shows the majority of the patients with IH came under an overweight group with a BMI of 25-29.9 kg/m2, i.e., 23 out of 59 cases (38.98%). Only 33.89% of patients came under normal groups with a BMI of 18-24.9 kg/m2. The number of cases with BMI <18 kg/m2 and >30 kg/m2 were 05 (08.47%) and 11 (18.64%) respectively. The mean BMI of patients with IH was 25.9 kg/m2.

Table 4 shows Midline incision leads to the maximum number of IH (55.93%). Pfannenstiel incision also had a significant share with 28.81% of cases, while other incisions leading to IH were subcostal incision, Mc Burne's incision, laparoscopic port site, etc. (Table 4). The average period of interval between surgery and appearance of IH was 45 days. And most of IH occurred between the first and second months.

Table 5 shows the most common cause of IH was post-operative wound infection (49.15%). The other causes were obesity (20.33%), improper rest (16.694), COPD (08.47%), BHP (5.8%) etc.

Table 6 shows. Previous emergency surgery lead to 51 out of 59 number of IH cases making a share of previous emergency surgery, about 86.44% in the incidence of IH. Only 08 out of 59 cases occurred after elective surgery, which amounted to 13.55% of IH cases.

Table 7 shows most common pathology during previous surgery was duodenal perforation (30.50%) followed by Caesarean section for childbirth (25.42%), malignancy (15.25%), volvulus (11.86%), open cholecystectomy (03.38%), open appendectomy (03.38%), laparoscopic cholecystectomy (03.38%), laparoscopic appendectomy (03.38%), etc.

Table 8 shows in most cases the size of the defect was more than 4 cm i.e., 28 out of 59 cases amounting to 47.45% cases of IH. About 22 cases out of 59, making approximately 37.28% of cases of IH, had a defect of 2-4 cm. About 09 cases out 59 amounting to 15.25% of IH cases, had less than 2 cm size defect.

Table 9 shows most of the cases (57.62%) were managed by open mesh hernioplasty i.e., 34 cases out of 59. 15 patients out of 59 (25.42%) were handled by Laparoscopic mesh repair. Suture repair was done in 10 cases (16.94).

Table 10 shows Laparoscopic mesh repair required average operative time of 120 min compared to 90 min in open mesh repair. The average hospital stay in the laparoscopic hernia repair group was three days, while in open mesh repair was seven days.

Table 11 shows Recurrence occurred in a total of 05 cases out of 59 cases (08.47%). Recurrence with suture repair was 04 cases out of 12, which accounts for 33.33% of the cases operated by suture repair. Recurrence in open repair was 1 case out of 28, making it to 03.57% of cases operated by open mesh repair, and none case of Recurrence was observed in laparoscopy mesh hernioplasty.

An abdominal incisional hernia is clinically common, with an incidence of 3% to 20.6%. The infection of the incision will increase the rate of hernia up to 23%. An 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 patients' life. However, every area has a different incidence. In our conducted study in a tertiary care hospital of Nagpur, 59 cases of IH in 2 years were found excluding the recurrent cases, complicated cases, and those unwilling to be included in the study.

This study shows male preponderance, i.e., 59 patients were included out of which 33 cases affected with IH were males accounting to 55.93% cases. Twenty-six cases were females making about 44.06% of cases of IH. (Table 1) which is comparable to the other studies. Zhang (2015); Kurmann *et al.* (2011) showed 72.5% males in laparascopic group and 67.5% in open group (Kurmann *et al.*,

2011). The mean age of our study is 42.3 years, 47.45% being between 25-45 years of age. Only about 20.33% 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 laparascopic 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 (Luijendijk *et al.*, 2000). 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 18.64% patients are obese i.e. 11 out of 59, while 08.47% were underweight which correlates with study by Pattnaik S.K. et al., where 19.6% patients were obese and mostly were men, while 7.8% were underweight (Pattanaik, 2019).

Midline incision leads to maximum number of IH cases (55.93%) in this study and Pfannenstiel incision contributes 28.81% of the cases. Subcostal IH are generally rare, as abdominal muscles can prevent from herniation. But in our study two cases of IH were observed after subcostal incision (open cholecystectomy). Mc Burney" s incision accounts for 03.38% of IH in our study and laparoscopic port site IH occurred in 3 cases (05.08%). 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 (Rangaswamy *et al.*, 2016).

In this study the most common cause was post-operative infection (49.15%). And obesity was the next possible cause with 20.33% of cases. Other causes are lack of rest, improper exercises, malignancy and co-morbid conditions, COPD, BHP, condition causing increased abdominal pressure and connective tissue disorder. Shaikh et al studied the commonest cause of IH to be post-operative infection accounting for 45.5% of cases, other causes being respiratory tract infections, COPD, abdominal distension, urinary infection and constipation (Shaikh and Shaikh, 1994).

Pattanaik (2019) showed that 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. Similar to these finding our study showed emergency surgery leads to 86.44% and elective surgery 13.55% of Incisional Hernia. Since emergency surgeries were done without pre-operative preparations, it may lead to post-operative complications like wound infections, which is the most common etiology for IH.

Size of the hernia is also important in deciding the treatment. In our study 47.45% cases had a defect of size more than 4 cm , 37.28% cases with a defect of size between 2-4 cm while 15.25% cases have defect of less than 2 cm. Study conducted by Pattnaik S.K. showed 37% cases having the size of the defect more than 4 cm and 35% cases having size of defect two to four cm, while 28% cases have defect less than two cm. Kurmann et al showed that in laparoscopic group 1.5% cases were in size less than 4 cm, 47.8% cases in 4 to 10 cm and 36.2% cases more than 10 cm, while in open repair group 8.9% were in size less than 4 cm, 30.4% between 4 to 10 cm and 19.6% were more than 10 cm. Duodenal perforation causing peritonitis during primary surgery was responsible for the greatest number of IH cases (30.50%) followed by obstetric gynae surgery (25.42%), malignancy (15.25%) and volvulus (11.86%). Open cholecystectomy, lap cholecystectomy, open appendec-tomy, lap appendectomy and others also contributed to causation of IH.

In our study out of 59 cases 34 cases (57.62%) were managed with an open mesh hernioplasty, 15 cases (25.42%) managed by laparoscopic repair and in 10 cases (16.94%) suture repair was done which closely correlates with the findings by Pattnaik S.K. where 19.6% cases were managed by suture repair 58.8% cases were managed by open mesh hernioplasty. Kurmann *et al.* (2011) studied 125 cases, in which 69 cases were managed laparoscopically and 56 cases via open repair. Roland et al studied 154 cases in which 80 cases were managed with suture repair and 74 were with mesh repair (Luijendijk *et al.*, 2000).

On comparing operating time for laparoscopic and open repair, this study had 120 min and 90 min respectively. Kurmann *et al.* (2011) observed average operating time for laparoscopic to open was 180 minutes for both, Hospital stay in their study was between 6 and 7 days for laparoscopic and open repair, while in this study it was 3 and 7 days respectively.

Recurrence is one of the most important complications of IH repair. In our study we have encountered 5 cases of Recurrence of which 04 cases (33.33%) were in suture repair category and 01 case (03.57%) in open mesh hernioplasty group and no recurrence in laparoscopic repair cases. In Pattnaik S.K. study the Recurrence was 4 out of 51 cases after 1 year follow up. Most of the recurrences were after suture repair (30%), in open mesh repair it was 3.3% and no recurrence was observed after laparoscopic mesh repair. Roland et al studied Recurrence of mesh repair and suture repair and found to have

43% recurrence in suture repair and 24% in mesh repair group (Luijendijk *et al.*, 2000). Compared to open mesh repair and suture repair, laparoscopic mesh repair got less Recurrence, less complication and less morbidity but it needs more technical skill and is less economic. Nowadays laparoscopic mesh repair is getting popular as it is cost effective in the long run.

## CONCLUSIONS

One of the most common complication of any surgical intervention is incisional hernia, particularly when performed in an emergency. Past surgical wound infections with 49.15 percent were the most common aetiology of IH in this study. Certain causes include obesity, COPD, BPH and insufficient rest.

On comparing different management techniques for IH, laparoscopic mesh repair needs comparatively more operating time and skill compared to open mesh repair and suture repair. But laparoscopic repair had lesser 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 hospital stay and recurrence rate. Limitations of the study are non-randomization and short follow up.

### Conflict of Interest

There is no conflict of interest.

### Funding Support

Nil.

## REFERENCES

Ceydeli, A., Rucinski, J., Wise, L. 2005. Finding the best abdominal closure: An evidence-based review of the literature. *Current Surgery*, 62(2):220–225.

Cheng, H., Rupprecht, F., Jackson, D., Berg, T., Seelig, M. H. 2007. Decision analysis model of incisional hernia after open abdominal surgery. *Hernia*, 11(2):129–137.

Greenall, M. J., Evans, M., Pollock, A. V. 1980. Midline or transverse laparotomy? A random controlled clinical trial. Part I: Influence on healing. *British Journal of Surgery*, 67(3):188–190.

Kurmann, A., Visth, E., Candinas, D., Beldi, G. 2011. Long-term Follow-up of Open and Laparoscopic Repair of Large Incisional Hernias. *World Journal of Surgery*, 35(2):297–301.

Luijendijk, R. W., Hop, W. C., van den Tol, M. P., de Lange, D. C., Braaksma, M. M., IJzermans, J. N., Boelhouwer, R. U., de Vries, B. C., Salu, M. K., Wereldsma, J. C., Bruijninckx, C. M., Jeekel, J. 2000. A Comparison of Suture Repair with Mesh Repair for Incisional Hernia. *New England Journal of Medicine*, 343(6):392–398.

Macnalty, A. S., Critchley, M. 1978. Butterworths medical dictionary. 2nd ed. London. *Butterworths*.

Musella, M. 2001. Magnetic resonance imaging and abdominal wall hernias in aortic surgery. *Journal of the American College of Surgeons*, 193(4):392–395.

Pattanaik, S. K. 2019. International Surgery Journal . *Int Surg J*, 6(4):1280–1286.

Rangaswamy, P., Rubby, S., Emmanuel, J. 2016. Clinical study of incidence and surgical management of iincisional hernia. *International Surgery Journal*, 3(4):1875–1878.

Shaikh, N. A., Shaikh, N. M. 1994. Comparative study of repair of incisional hernia. *Journal of the Pakistan Medical Association*, 44(2):38–39.

Sørensen, L. T. 2005. Smoking Is a Risk Factor for Incisional Hernia. *Archives of Surgery*, 140(2):119–142.

Zhang, L. 2015. Incidence of abdominal incisional hernia in developing country: a retrospective cohort study. *International journal of clinical and experimental medicine*, 8(8):13649–52.