



CLINICAL STUDY AND MANAGEMENT OF INCISIONAL HERNIA WITH MESH REPAIR

Surgery

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ABSTRACT

Objective: 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.

Background: Incisional hernia is the one true iatrogenic hernia. 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 usually starts early after surgery, as a result of failure of the lines of closure of the abdominal wall following laparotomy.

Material and methods: The study was carried out a prospective study of 60 consecutive patients who underwent mesh repair for symptomatic incisional hernia in the period between October 2019 and April 2021 in G.R. Medical College and Jaya Arogya Hospital, Gwalior.

Results: In our study, out of 60 patients of incisional hernia predominant in females and compared to males mainly between 41-50 years of age predominantly 65% presented with complaint of swelling in abdomen. Etiological factor in our study which lead to hernia is wound infection followed by wound dehiscence and maximum incidence seen after gynaecological procedures and lower midline incision. Incisional hernia predominant in general anesthesia who had previously operated. Incisional hernia is predominantly observed in our study who had previously operated open surgery comparatively laparoscopy procedures.

Conclusion: Conscientious aseptic technique and careful closure of the abdominal wound is necessary for preventing incisional hernia. Conventional preoperative preparation of the patients with high risk is an important factor in preventing recurrence of incisional hernia. The post-operative complications can be decreased by the utilization of suction drains in mesh repair.

KEYWORDS

INTRODUCTION

Incisional hernia has followed abdominal surgery like a shadow for more than a century now. Incisional hernia is the one true iatrogenic hernia. 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 5-11% of patients subjected to abdominal operations¹². Many factors are associated with incisional hernia like age, sex, obesity, chest infections, type of suture material used and most important wound infection.

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 lead to strangulation of abdominal contents. An incisional hernia can incarcerate, obstruct, perforate all of which markedly increase the risk to patient's life.

With the advent of anaesthesia, antiseptics, antibiotics and greater understanding of anatomy, the scientific approach to hernial treatment dawned. Use of the above three concepts, incisional hernia is repaired with least morbidity, mortality and recurrence rates.

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.

MATERIAL AND METHODS

A prospective study of 60 consecutive patients who underwent mesh repair for symptomatic incisional hernia in the period between October 2019 and April 2021 in G.R. Medical College and Jaya Arogya Hospital, Gwalior, Abdominal ultrasound was done pre-operatively, the diagnosis of incisional hernia will be made and the presence of ancillary findings will be recorded.

Inclusion Criteria

- Patients with diagnosis of Incisional hernia.

- Patients in the age group of 18 to 70 years.
- Patients willing to give informed consent.

Exclusion Criteria

- Local and systemic infections
- Refusal to consent
- Patient who are not medically fit to surgery
- Significant cognitive impairment
- Metabolic disorders
- Rapidly progressive neurological disease.

METHODOLOGY

- A detailed history of all patients was taken and a thorough clinical examination was done a very important step to determine the type and cause of hernia.
- All patients were analyzed in various aspects like age, sex, risk factors, 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 and HR USG of parietal valve were done. All the cases were operated and procedure adopted was antomocal repair or mesh repair. The immediate post operative complications were evaluated. Long term complications like recurrence, chronic infections and sinus tract formation were also evaluated. A master chart dealing with all aspects has been designed and presented.

RESULTS

Table 1 : Distribution of cases according to age

Age (yrs)	No. of patients	Percentage
20-30	2	3.3
31-40	12	20
41-50	21	35
51-60	18	30
61-70	7	11.7
Total	60	100

The youngest patients operated in this study was 25 years old and the

oldest to be operated was 70 years.

Out of 60 cases 3.3% were in 20-30 years age group, 20% were in 31-40 years age group, 35% were in 41-50 years age group, 30% were in 51-60 years age group, 11.7% were in 61-70 years age group.

It showed that maximum number of cases were in older age group of 41 to 80 (i.e. 46 out of 60 cases).

Table 2 : Distribution of cases according to gender wise

Gender	No. of patients	Percentage
Male	19	31.7
Female	41	68.3
Total	60	100

In our study, out of 60 cases 19(31.7%) were males and 41(68.3%) were females as per Table(2) suggesting that incisional hernia is more common in females than males and the overall ratio is M:F :: 1:2.15 .

Table 3 : Distribution of cases according to symptoms

Symptoms	No. of patients	Percentage
Swelling	39	65
Swelling and pain	20	33.3
Pain	1	1.7

In our study, the commonest symptom was swelling (65%). Swelling was visible on standing or exertion. Other 33.3% cases presented with the swelling and pain. Patients with only pain found in 1.7% cases.

Table 4 : Distribution of cases according to risk factor

Risk factors	No. of patients	Percentage
No complications	29	48.3
Wound infection	14	23.3
Wound dehiscence	7	11.7
Postoperative cough	0	0
Repeat surgery	0	0
COPD	2	3.3
Obesity	3	5
DM	3	5
Constipation	1	1.7
Hypertension	1	1.7

In our study 31 patients had previous post-operative complications in the form of wound infection (14 patients) and wound dehiscence (7 patients). The other risk factors were Obesity (3 patients), COPD (2 patients) and Constipation (1 Patient). 29 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 5 : Distribution of cases according to previous incision used

Incision	No. of patients	Percentage
Lower midline	18	30
Upper midline	3	5
Paramedian	1	1.7
Transverse	10	16.7
Oblique	14	23.3
Midline	14	23.3

In our study, the patients had previous operations using lower midline abdominal incisions in 30%, Midline incisions in 23.3%. Other incisions were Upper Midline, Transverse, Para-median, and Oblique Lumbar, which led to the incidence of incisional hernia

Table 6 : Distribution of cases according to previous surgeries

Previous surgeries	No. of patients	Percentage
Hysterectomy	9	15
LSCS	4	6.7
Tubectomy	9	15
Exploratory laparotomy	12	20
Appendectomy	4	6.7
Hernioplasty	9	15
Herniorrhaphy	4	6.7
Laparoscopy	1	1.7
Nephrectomy	1	1.7
Cholecystectomy	6	10
I & D	1	1.7

All the patients were enquired about the type of operation they had

undergone previously and complications if any in the postoperative period. 36.7% of patients under went gynaecological procedures, out of which Hysterectomy was the most common surgery followed by tubal ligation. The gastrointestinal surgeries accounted upto 63.3%.

Table 7 : Distribution of cases according to type of anaesthesia used

Type of anaesthesia	No. of patients	Percentage
General anaesthesia	39	65
Spinal anaesthesia	21	35
Total	60	100

The patients operated in General Anaesthesia were 39 out of 60. Rest of the cases were operated under Spinal anaesthesia.

Table 8 : Distribution of cases according to laparoscopic vs open surgery

Laparoscopic/Open	No. of patients	Percentage
Laparoscopic	2	4
Open	58	96
Total	60	100

In our study, out of 60 patients, 58 (96%) patients had open surgery while 2(4%) patients had laparoscopic surgery

DISCUSSION

Incisional hernia due to lack of perfection in abdominal wounds closure. The incidence of burst abdomen has been decreasing due to availability of better suture, newer antibiotics and better techniques of wound closure.

60 cases of incisional hernia admitted for the treatment from Oct. 2019 to Oct. 2021 are presented in this study. This study may not reflect all the aspects of incisional hernia, as the series is small due to COVID19 Pandemic 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 41-60 years. Ellis, Gajraj and George in their study noticed a mean age of 49.4 years.³ The youngest age in our study was 23 years and oldest age was 70 years.

According to sex incidence of incisional hernia among the 60 cases studied is 2.15:1(Female:Male) showing a female preponderance. The laxity of muscles of the abdomen due to multiple pregnancies and also an increased incidence of obesity in females make them females more prone for developing incisional hernia. There were 64.6% female population who had incisional hernia in the study of 383 patients, conducted by Ellis, Gajraj and George.³ In the Studies done by Parekh JN;⁴ and Goel TC⁶ the male to female ratio are 1:1.17 and 1:1.25 respectively.

In our country, Incidence of incisional hernia is more common in females. This might be due to multiple child births making the abdominal wall weak. In our study, majority of cases of incisional hernia are females (68.3%) and we have already discussed the reason for it.

Mostly patients of incisional hernia presented with abdominal swelling (65%). While other patients of incisional hernia presented with swelling and pain over abdomen(33.3%). This presentation in our study matches the internationally reported presentations.

The precipitating factors for incisional hernias, wound infection accounted for 23.3% in our study. Other risk factors obesity(5%) and wound dehiscence(11.7%) in our study observed. This is frequently equivalent to that of Bose et al studies within 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 might be compared with Ponka's studies(25%).⁶ Brenden Devlin utters the repeated wounds within the same region or simply parallel to each other will often cause the event of herniation.⁷

Wound infection is the leading cause of post-operative herniation as it leads to fascial necrosis leading to loss of integrity of closure. The infection causes inflammation and oedema of the tissues – leading to softening of tissues which ultimately result in weakening of tissue. The outcome of these events is that the sutures pull through under the strain

of intra-abdominal pressure. Obesity cause enormous tension on suture, causing a defect in abdominal wall.

In our study 30% of the incisional hernia occurred in lower midline incisions. This may be due to subsequent features:

- Intra-abdominal hydrostatic pressure is towards the higher side in lower abdomen as compared to upper abdomen in standing position i.e., 20cm of water and 8cm of water respectively.
- Posterior rectus sheath is absent below arcuate line.
- This incision is employed in gynaecological surgeries who have poor abdominal wall musculature.

This is comparable with A.B. Thakore et al studies(67.1%)⁵ and Goel and Dubey studies(44.6%)⁶.

Over 47.5% of cases occurred following gynecological procedures (Hysterectomy, Ligation of fallopian tube, Caesarean sections). This might be because most of the surgeries were done through lower midline incisions. Among the Gynecological surgeries, Ponka,⁷ and Goel and Dubey⁶ noted 36 % incidence and 28.76% incidence respectively in their studies.

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 believed that only the smallest (less than 3 cm) incisional hernia should be mended by primary tissue approximation with sutures. A population based study of 10 882 patients in the United State found an elevation in the frequency of the utilization of synthetic mesh from 35% in 1987 to 65% by 1999.

In our study polypropylene mesh and also the suture material of the identical type was used to repair the incisional hernias and also the technique of the repair was decided by the tone of abdominal muscle, size of the hernia defect, whether this defect might be approximated without tension and general condition of the patient. 60 out of 60 were treated with Onlay polypropylene mesh repair.

Wound Infection occurred in 2 patients, while 3 patients had seroma formation, hematoma formation in 3 patients after mesh repair and recurrence in 4 patients.

Usher⁸ reported 0% recurrence in 48 patients who were managed by polypropylene mesh repair. Jacobus W.A et al.⁹ revealed a ten year cumulative rate of recurrence of 63% in anatomical repair and 32% in mesh repair. The recurrence rate thus varies in several studies but all studies support mesh repair for minimizing the recurrence rate.

With complete patient evaluation, adequate skin preparation before surgery, accurate surgical technique, non-absorbable sutures use for musculo- aponeurotic tissue, suction drain use, peri-operative broad spectrum antibiotics use, nasogastric aspiration, early ambulation and chest physiotherapy, complication rates in our study were restricted to minimum.

With prosthetic mesh, defects of any size may be repaired without tension. The polypropylene mesh, by inducing inflammatory response sets up scaffolding that successively induces the synthesis of collagen. Thus the prevalence of mesh repair over suture repair must be accounted for.

CONCLUSION

The application of midline incision should be confined to surgeries in which illimitable access to the abdominal cavity is necessary. Conscientious aseptic technique and careful closure of the abdominal wound is necessary for preventing incisional hernia. Conventional preoperative preparation of the patients with high risk is an important factor in preventing recurrence of incisional hernia. The post-operative complications can be decreased by the utilization of suction drains in mesh repair.

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