



Safety and effectiveness of IPOM in primary ventral hernia: Our experience

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

ABSTRACT

Introduction:- Ventral hernias occur as a result of weakness in the musculo-fascial layer of the anterior abdominal wall. In general ventral hernias are classified into congenital, acquired, incisional and traumatic. Even though ventral hernia is one of the commonest pathology encountered in outpatient department, management of ventral hernia had significant heterogeneity. In this study we elaborated our experience we had in laparoscopic intra peritoneal mesh hernioplasty in primary ventral hernia.

Methodology and aim: The aim of the article is to study the safety and effectiveness of laparoscopic IPOM in primary ventral hernia with special consideration to ASA, BMI in patient outcomes, in-terms of local wound complications and recurrence. This retrospective study was conducted in General surgery department, VMMC & Safdarjung hospital, New Delhi. Data was collected from the clinical records during inpatient and outpatient treatment of 73 patients with primary ventral hernia (umbilical, paraumbilical, epigastric) who underwent laparoscopic intra peritoneal mesh hernioplasty during May 2016-2019.

Results:- Male: female ratio was 1: 2.32. Age range was between 24- 58 years. Out of total of 73 patients undergoing IPOM, there were 37 umbilical, 26 paraumbilical and 10 epigastric.

On the follow up over the period of two years we observed incidence of seroma was 13%, Surgical site infection was 20% and recurrence was 4%. In our observation, all these complications have significant correlation with Comorbidities of the patient (ASA ≥ 3), BMI (>35), mesh overlap (<3 cm).

Conclusion: Laparoscopic intra peritoneal mesh hernioplasty for primary ventral hernia is showing promising results less Postoperative pain, lesser hospital stay, lesser wound infection and early bowel movement, faster resumption of routine activities.

Keywords: Laparoscopic mesh repair, Primary Ventral hernia, IPOM.

INTRODUCTION

Ventral hernias repair is one of the commonest surgical procedure performed nowadays. Ventral hernia basically due to defect in anterior abdominal wall. It may either primary or acquired. Based on the location of the defect it further classified into umbilical, paraumbilical, epigastric, spigelian and lumbar hernias. Almost all the types of ventral are now treated by laparoscopic intra peritoneal mesh hernioplasty nowadays because of its inherent advantages and added benefits in contrast to open surgery.

Ventral hernias if left untreated, it inevitably increases in size and make it more difficult for surgery later. They also increase the risk of hernia related complications such as obstruction and strangulation which endanger the life of the patient. The treatment for the ventral hernia is evolving with time. Primary suture repairs were done in the beginning which carried unacceptably high recurrence-rates. Significant reduction in the overall recurrence rate from 63% to 32% with the introduction of mesh repair even for small defects, hence it became the gold standard management for hernia. After the advent of laparoscopic procedures

further advances happened in the types and technique of hernia repair¹.

Ever since the introduction of laparoscopic ventral hernia repair by Leblanc K in 1993, it gained confidence and success among surgeons². It results in less operative pain, lesser post op hospital stay and better cosmesis.³⁻⁵ Various studies proved that there is definite advantage of using prosthesis instead of anatomical repair⁶. There are multiple studies comparing laparoscopic and open repairs suggested that recurrence rate was similar for both around 9%⁷. Ventral hernia becomes complicated when it undergoes Irreducibility, Obstruction and Strangulation or gangrene. Very large hernia with skin changes and ulceration are also considered complicated.

The aim of the article is to study the safety and effectiveness of laparoscopic IPOM in primary ventral hernia with special consideration to ASA, BMI related patient outcomes in terms of local wound complications and recurrence.

Methods:

A retrospective study conducted in the Department of general surgery during May 2016-2019 and data was collected from clinical records during Inpatient and out-patient treatment of 73 patients who underwent laparoscopic mesh repair for Primary ventral hernia. The patients were followed for the period of two years to look for immediate and long term morbidity.

Inclusion criteria:

- All patients with primary ventral hernia (epigastric, umbilical, paraumbilical) presented to outpatient deformity.

- defect size < 5 cm
- Non smokers (or abstinence of smoking for >2 months before surgery).

Exclusion criteria:

- H/o previous surgery
- Defect larger than 5 cm
- Infection and peritonitis
- Acute and chronic intestinal obstruction
- Severe cardio pulmonary disease
- Portal hypertension

Once the patient was included for study, routine investigations along with preanaesthetic check up was done. In procedure, each patient was laid supine on operation table, operative parts painted and draped. Pneumoperitoneum was created by open method through palmar's point and rest of the ports were placed by baseball diamond concept. Hernial sac contents reduced and raw area was created 4-5 cm around the defect. Defect size was measured intra operatively after deflating (for exact size of the defect) the abdomen and corners were marked externally. Re insufflation done and composite mesh (PROCEED) was introduced through the camera port after taking prolene stay stitches from all four corners. Mesh was fixed by trans-fascial sutures with overlapping of 4-5 cm from the defect margin. After achieving complete haemostasis port closure done by Vycryl 1 - 0. Skin was closed by using Nylon 3'0 and aseptic dressing applied. (Figure 1 and 2)



Figure 1:- visible umbilical hernial defect bulged out due to pneumoperitoneum along with trochars placed.



Figure 2: PROCEED mesh applied and fixed with teckers and subfascial sutures over the defect after reducing contents.

Postoperatively all the patients received Paracetamol 1gram infusion thrice a day as a standard protocol. Post operative outcomes were monitored on Day 1-7 and post discharge follow up under following headings:-

- Post-operative pain by Visual analogue scale
- Number of days of hospital stay
- Seroma
- Surgical site infection
- Recurrence

Results:

A total 73 patients were studied who underwent laparoscopic intra peritoneal onlay mesh repair in our institution. Among them youngest patient was with the age of 24 yrs and old one was with 58yrs.

Table 1:- male to female ratio

Male	22
Female	51
Ratio	1: 2.32

Table 2:- ventral hernias and their frequency

Type of hernia	Frequency
Umbilical	37
Paraumbilical	26
Epigastric	10

Table 3:- American society of anaesthesiology(ASA), Body Mass Index(BMI) taken as preoperative parameters and Mesh overlap taken as intraoperative parameter.

ASA <3	26	35.61
ASA ≥3	47	64.39
BMI <35	32	43.83%
BMI ≥35	41	56.17%
MESH OVERLAP <3 cm	5	6.84%
MESH OVERLAP ≥3cm	68	93.16%

Hospital stay: Average hospital stay of the patient was 3.5 days from the day of admission which was significantly lower in contrary to open procedure. This was due to less post operative pain and early bowel movements recovery.

Following complications were noted intraoperatively and post operatively in follow-up:-

- 1) Intra-operative bleeding usually occurs at the time of trochar placement from major vessels of abdominal wall, mostly from inferior epigastric artery and less frequently from visceral injuries. In our study group only two of our patients developed intra operative bleeding which was managed

conservatively by stitches without the need of conversion. There were no bleeding episodes while reducing contents or injuring structures during trochar insertion.

- 2) Post operative pain: Over all Post operative pain score was less than 3 (according to VAS) in 83.2% of the patients observed however immediate post operative pain score was higher due to dissection and application of trackers to fix the mesh.

- 3) Other complications: On the follow up over the period of two years we observed incidence of seroma was 13%, Surgical site infection(SSI) was 20% and recurrence was 4%. In our observation, all these complications have significant correlation with Comorbidities of the patient ASA(table 4), BMI(figure 3) and mesh overlap (figure 4).

Table 4:-

ASA SCORE	TOTAL PATIENTS	PATIENTS WITH SSI
<3	26	0
>3	47	20

20 out of 45 patients with ASA score >3(42.42%) had SSI in postoperative phase. Hence, it shows that with increase in ASA score, the patients had more chance of surgical site infections ($p < 0.001$).

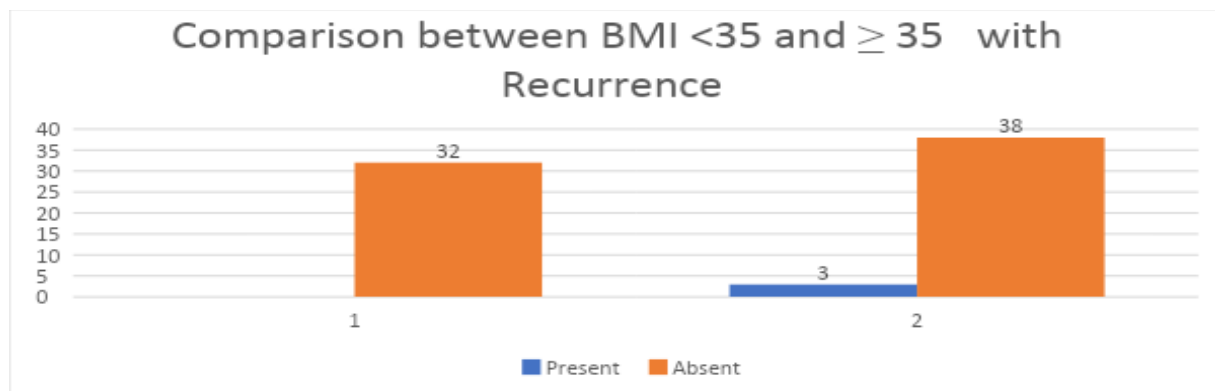


Figure 3:- shows group 1 as BMI <35 and group 2 as BMI > 35. Out of 32 patients with BMI < 35, no patient had recurrence. On the other hand, out of 41 with BMI > 35 patients operated 3 had recurrence. Hence, BMI is a significant marker of recurrence in patients operated for ventral hernias using IPOM.

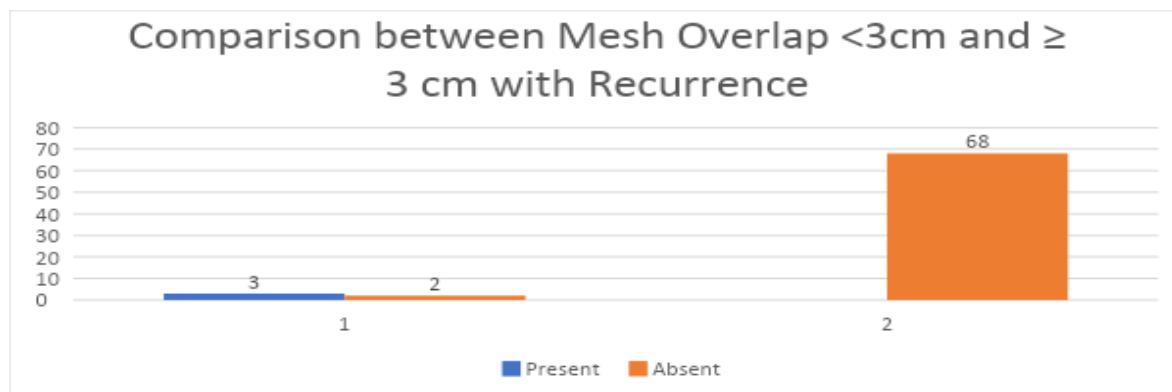


Figure 4:- shows group 1 in which the margins of overlap were less than 3 cm. This was mostly in cases of complicated epigastric hernias (5 out of total 10 cases) in which the superior margins were near to the diaphragm and hence, mesh overlap and fixation was not possible beyond 3cm. Out of these 5 cases, 3 patients had recurrence. In group 2, in which the overlap was more than 3 cm, there was no recurrence in total 68 operated cases. Hence, mesh overlap and the anatomical location is an important factor in recurrence (p value < 0.001)

Discussion:-

Prosthetic mesh repair is the gold standard management for hernia Surgery due to significantly reduction in the recurrence rates. Because of the worldwide acceptance of laparoscopic surgery, it becomes the alternative for open meshplasty. The advantages are smaller incision, lesser dissection, lower incidence of wound complication, reduced requirement of analgesics, and hospital stay.

In our observation of Laparoscopic intra peritoneal mesh hernioplasty for primary ventral hernia is associated with less post operative pain (score <3). Even though early Post operative pain score was higher which further significantly reduced on day 3 or day 4. However the incidence of chronic pain was then constant at 1 month and 3 months but was reported in upto 10% patients at 6 months⁸.

In our study observation, need of post operative hospital stay was significantly reduced by Laparoscopic IPOM, which is due to early bowel movement recovery and less post-operative pain. In our study group, only 3 patients developed ileus and recovered in 5th POD. Heinfeld *et al*⁹. with 850 cases, postoperative ileus was reported in 3% cases who underwent laparoscopic surgery. The INCH trial reported that time of full recovery after surgery between the two treatment strategies favours laparoscopy group and hence is a more cost-effective approach¹⁰.

We then assessed the incidence of various possible complications that could occur in the perioperative and remote postoperative period in order to gain a realistic perspective of this technique before proposing it as a standard of care. Even though laparoscopic repair had advantages over open repair, certain complications can be avoided by

careful selection of the patients. In our study observation, complications like seroma, surgical site infection, and recurrence had significant correlation with ASA (comorbidities of the patient), BMI, and mesh overlap (>3cm).

In subgroup analysis, among the patients with ASA >_3 (patient with comorbidities), 10.8% developed seroma, 20.2% of them developed Surgical site infection which is statistically significant (p<0.001). Apart from ASA, BMI >_35 is an independent risk factor for seroma, SSI and recurrence (4%, p value <0.001).

In long term follow up for recurrence, besides ASA and BMI, the most important factor responsible for recurrence is mesh overlap. In the subgroup analysis of mesh overlap, patient with mesh overlap of < 3 cm associated with 4% recurrence which is statistically significant (p value <0.001).

Conclusion:-

Laparoscopic IPOM has established itself as a well-accepted treatment option for ventral hernias compared to open repairs in terms of less post-operative pain, early bowel movement recovery, and lesser hospital stay. Even though appropriate patient selection, optimisation of comorbid conditions, pre-operative weight reduction, adequate mesh overlap are needed to avoid complications such as seroma, SSI, and recurrence.

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