

# Intraperitoneal Onlay Mesh in Ventral Hernia Repair – Experience in A Tertiary Care Hospital in Bangladesh

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## Abstract

**Background:** Ventral hernias are common problem in surgical practice. Repair of hernia by a prosthetic mesh is a well recognized procedure. But whether the procedure is to be done by open or laparoscopic technique is still a topic of discussion. Laparoscopic intraperitoneal onlay mesh (IPOM) hernioplasty is a newer technique in managing ventral hernia in our country. We are evaluating the usefulness of this procedure as routine operation for ventral hernias.

**Methods:** All patients attending at Bangladesh Institute of Research & Rehabilitation of Diabetes, Endocrine and Metabolic disorders (BIRDEM) outpatient department (OPD) with ventral hernia were approached and counseled for laparoscopic IPOM, but only those who agreed were included in this study. Fifty consecutive patients underwent IPOM by a single surgeon. Preoperative evaluation was done rationally and surgery performed by standard laparoscopic method. Age, sex, diabetes status and additional procedures done were evaluated. Post-operative follow up period was from 3 months to 75 months and any complication or recurrence were noted.

**Results:** We are reporting 50 cases of laparoscopic IPOM, over a time period of 78 months (April 2010-September 2016). Eleven cases were male, 39 female (M: F=1:3.5). 35 (70%) cases were diabetic, 15 (30%) were non-diabetic. Mean age of the patients were 47.7yrs (male 47.7+9.5 yrs, female 47.7- 2.6 yrs, diabetic patients 47.7+ 2.5yrs, non-diabetic patients 47.7-5.9yrs). Indication for IPOM was paraumbilical hernia 29 cases (58%), incisional hernia 14 cases(28%), multiple incisional hernia 2 cases ( 2 large defect in one case, 5 defects of varying size in another patient), umbilical port hernia 2 cases, paraumbilical along with incisional hernia 1 case, epigastric hernia 1 case, lumbar hernia 1 case. In 48 cases (96%) polypropylene mesh and only in 2 cases (4%) dual mesh were used. In addition to IPOM procedure, in same sitting laparoscopic cholecystectomy was done in 8 cases, Dilatation & Curettage in 1 case and adhesiolysis in 7 cases. None of the case required conversion to open, neither was there any intra-operative complication. In one case there was recurrence. In another case there was false recurrence due to development of ascites. Four patients developed seroma which were managed conservatively.

**Conclusion:** Laparoscopic intraperitoneal onlay mesh (IPOM) hernioplasty has proved to be an effective surgical procedure for ventral hernia repair. It provides much benefits with low complications and conversion in experienced hands.

**Key words:** Ventral hernia, intraperitoneal onlay mesh (IPOM) hernioplasty, polypropylene mesh, dual mesh.

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## Introduction

Ventral hernias are common problem in surgical practice. A large number of ventral hernias are incisional hernia and port hernia, which are complications of previous surgery. These patients are generally surrounded by mistrust on surgeons, financial load of a second surgery, fear of recurrence and subsequent surgery. Managing these patients is not only a procedural challenge but also a socio-economic challenge to regain the faith of the patient and offer a cost effective,

minimum recurrence option for the patient. Repair of hernia by a prosthetic mesh is a well-recognized, low recurrence procedure<sup>1</sup>. But whether the procedure is to be done by open or laparoscopic technique is still a topic of debate. Open hernioplasty has a recurrence rate of 12.5% -19%<sup>2,3</sup>. But, this technique is done in tissues that already is of poor quality either because of mechanical effect of hernia or because of comorbidities. Moreover, this method has several drawbacks, such as, extensive soft tissue dissection, raising of flaps, and placement of drains. This leads to a complication rate of up to 20% involving the wound, exposure and infection of mesh, fistula formation and other problems<sup>4-6</sup>. On the other hand, laparoscopic intraperitoneal onlay mesh (IPOM) hernioplasty is a newer technique in managing ventral hernia in our country. The usefulness of this procedure as routine operation is evaluated in this study

### Methods

All patients attending at BIRDEM OPD with ventral hernia were approached and counseled for laparoscopic IPOM hernioplasty, but only those who agreed were included in this study. Fifty consecutive patients underwent IPOM hernioplasty, over a time period of 78 months (April 2010- September 2016). All cases were done by a single surgeon in BIRDEM general hospital, Dhaka. Preoperative evaluation was done by clinical assessment. Abdominal ultrasonogram was done in selected cases where there was confusion about the defect especially in obese patients. Location of the hernia was traced, position of the ports marked and expected location of mesh mapped, just before the patient is mounted on operation table (Fig 1). IPOM was performed using three puncture technique. Pneumoperitoneum was established by placement of a Veress needle into left subcostal area in mid-clavicular line (Fig 2). A 10mm port was introduced in left anterior axillary line at the level of the defect, and two 5mm ports on either side a little in front of the previous one. Contents were reduced by external pressure and internal traction. Adhesions were cut at avascular line using scissors and cautery. Bowel loops were covered with omentum where possible, otherwise a non-adhesive dual mesh was used. Mesh was marked at center, suture ligatures were placed at corners (Fig 3). The center was

fixed with atraumatic suture with straight needle. Then the mesh was rolled and introduced through the 10mm port. The needle was pushed out through skin puncture at the center of the defect. Suture passer puncture was done over the corners of the mesh and ligature ends were brought through the same skin puncture wound at each corner keeping intervening tissue in between separate puncture sites in inner parietal wall. The suture ends were tied, cut and the knot allowed to slip within tissue through the external puncture points. Margins of the mesh were fixed with parietal wall from inside using titanium spiral tack (Fig 4, 5). Age, sex, glycaemic status, incidental findings, additional procedure done, length of stay in hospital were evaluated. Post-operative follow up period was from 3 months to 75 months and any complication and recurrences were noted.

### Results

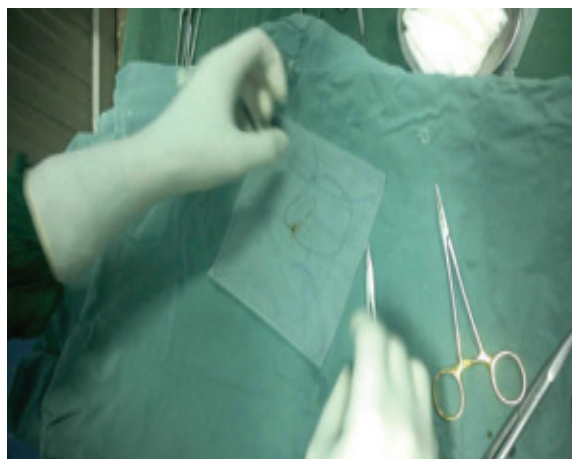
In this series, out of 50 cases, 11 cases were male, 39 female (M: F=1:3.5) (Table I). 35 (70%) cases were diabetic, 15 (30%) were non-diabetic. Mean age of the patients were 47.7yrs (male 47.7+9.5 years, female 47.7- 2.6 years, diabetic patients 47.7+ 2.5yrs, non-diabetic patients 47.7-5.9yrs). Indications for IPOM (Table II) was paraumbilical hernia 29 cases (58%), incisional hernia 14 cases (28%), multiple incisional hernia (Swiss cheese hernia) 2 cases ( 2 large defect in one case, 5 defects of varying size in another patient), umbilical port hernia 2 cases, parumbilical along with incisional hernia 1 case, epigastric hernia 1 case, lumbar hernia 1 case. In 48 cases polypropylene mesh and only in 2 cases dual mesh was used. In addition to IPOM procedure, in same sitting laparoscopic cholecystectomy was done in 8 cases, dilatation & curettage in 1 case and adhesiolysis in 7 cases. 33 patients (66%) were discharged in the first post-operative day. All patients were discharged within 60 hours of surgery. None of the cases required conversion to open. There was no intra-operative complication. One case developed recurrence of hernia 2 years after IPOM, due to excessive weight gain and mesh migration. One case developed false recurrence due to development of End Stage Liver Disease and ascites. Four patients developed seroma which were managed conservatively without any surgical intervention. There was no mortality in this series.

**Table I.** Demographics of Patients Undergoing Laparoscopic IPOM Hernioplasty

April-2010 - September-2016		
Number-50		
Male-11 (22%)		
Female-39 (78%)		
Diabetic-35 (70%)		
Non-diabetic-15 (30%)		
Age: Mean- 47.7 years	: Male- 57.2yrs	: Diabetic patients- 50.2yrs
	: Female- 45.1yrs	: Non-diabetic patients- 41.8yrs

**Table II.** Indications for Laparoscopic IPOM Hernioplasty

Indication	Frequency	Percentage
Paraumbilical hernia -	29	58%
Incisional hernia -	14	28%
Multiple incisional hernia -	2	4%
Paraumbilical hernia + incisional hernia -	1	2%
Umbilical port hernia -	2	4%
Epigastric hernia -	1	2%
Lumber hernia –	1	2%



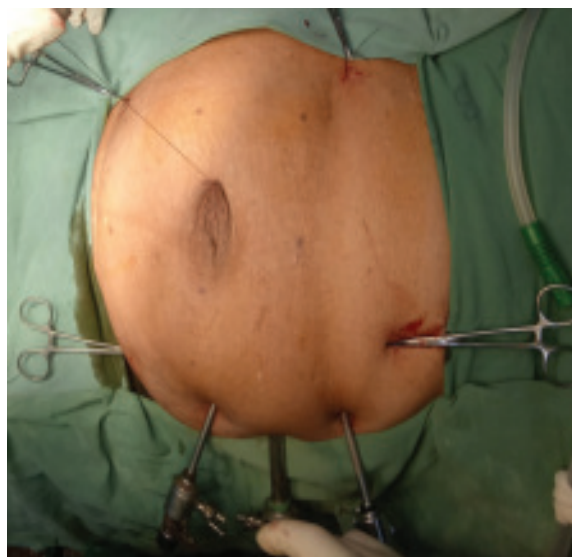
**Figure 3.** Preparation of the mesh



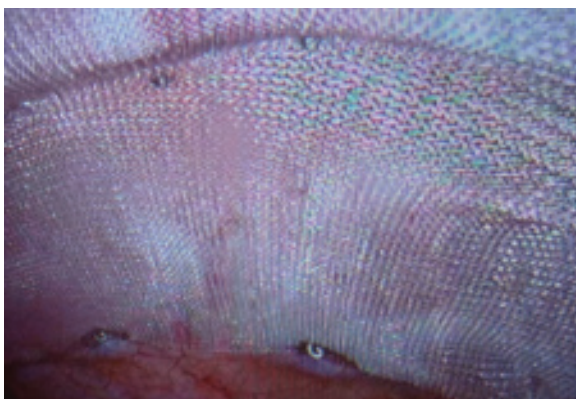
**Figure 1.** Hernia is traced, position of ports marked and expected location of mesh mapped



**Figure 2.** Making a pneumoperitoneum



**Figure 4.** Fixation of the Mesh at the corners and centre with vicryl



**Figure 5.** Additional mesh fixation with tack

### Discussion

Incisional hernia develops in 3% to 13% of laparotomy operations<sup>1</sup>. Repair of hernia by a prosthetic mesh is a well-recognized, low recurrence procedure. But whether the procedure is to be done by open or laparoscopic technique is still a topic of debate. In laparoscopic IPOM hernioplasty, the surgical wound is small. Hence, there is short hospital stay, lower wound complications, reduced post-operative pain and early recovery<sup>7-9</sup>. In addition, in IPOM hernioplasty, the mesh is placed intraperitoneally. So, extensive tissue dissection is not required. The mesh overlaps the defect by at least 3-5cm margin, giving a strong support. Hence, a better post-operative outcome<sup>10-12</sup>. In our series, patients' demography is similar to other studies<sup>12,13</sup>. More than three fourth of the patients are female. This is probably due to lax and weak anterior abdominal wall in females due to repeated child birth. In addition, history of caesarean section in females is an important predisposing factor. Due to the social culture in this region, females return to strenuous household activities after a major surgery too soon, resulting in high incidence of incisional hernia. Unlike our study, incisional hernias are the majority of the cases in different studies<sup>12,13</sup>. In our study, more than 50% are paraumbilical hernia. It is difficult to explain this difference. However one explanation maybe that in our society small paraumbilical hernias are ignored and patients seek medical help when the hernias become large and symptomatic. As a result patients present later in life. It is observed that female patients present at least 10years earlier to male patients. In this series, it was noticed that non-diabetic patients presented 10 years earlier than diabetic patients, but there is no relevant data in available publications.

Most of the studies used polypropylene mesh<sup>1-5,7-13</sup>, as is used in our series. We used polypropylene mesh as it is the most available and cheaper compared to other meshes.

Recurrence is 2% in our series, in comparison to other studies (3%-11%)<sup>4-8</sup>, it is much less. This difference is probably due to the large number of cases in different studies, and because large complex hernias were attempted for laparoscopic repair.

There are a few limitations of the study. First the number of case is small, second, it is a retrospective study. Strength of the study is inclusion of all cases with ventral hernia who were willing and able to afford expenditure irrespective of clinical state or image findings.

### Conclusion

Laparoscopic intraperitoneal onlay mesh (IPOM) repair was observed to be an effective surgical procedure for ventral hernia repair. It provides much benefits with low complications and recurrence in experienced hands. Hence it can be considered as primary procedure for ventral hernia repair.

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