

Laparoscopic ventral hernia repair –Early Experience in 25 patients

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Abstract- Background -Laparoscopic Ventral hernia repair now days is a method of choice. It has benefits of shorter hospital stay, lesser pain and fixation of a large sized mesh apart from the cosmetic benefit. Although, it remains a challenging procedure more so in re operative abdomen and malignancy. The procedure is expensive, as the mesh used is costly along with its fixation devices. The aim of this study is to evaluate our experience of Laparoscopic ventral hernia repair on various parameters. **Material and Methods-** Ventral and incisional hernia was repaired by Laparoscopic intra peritoneal onlay mesh repair (IPOM) in 25 patients at a single centre within 2 years between January 2013 to December 2014. This was done at a tertiary care centre by a single operating team standardizing the procedure and evaluating the learning curve. **Results-** 25 patients underwent laparoscopic intraperitoneal onlay mesh repair (IPOM) of which 15 were females and 10 males. The average age was 52 years (35-72) with the size of defect ranged from 4-12 cm. Dual mesh with ePTFE used in all patients. 12 case were incisional hernias, 10 paraumbilical hernia, 3 case umbilical hernia. Of these 7 were recurrent incisional hernia after open mesh hernioplasty, 1 case was post laparoscopic IPOM. Mean operative time was 60-130 minutes. There were no conversion to open technique. The average Hospital stay 2-3 days. 1 patient had post operative Richters' hernia which was managed by re laparoscopic reduction and transfascial closure of the defect. 3 patient had post operative ileus, minor wound infection in 1 patient, seroma in 1 patient. The average follow up period was around 12months. **Conclusion-**Laparoscopic intraperitoneal onlay mesh ventral hernia (IPOM) repair is feasible and safe in most cases with benefits of rapid recovery and better overall patient outcomes more so in large recurrent incisional hernias and malignancy.

Index Terms- Laparoscopic, Ventral hernia, IPOM, Incisional Hernia

I. INTRODUCTION

Laparoscopic intraperitoneal onlay mesh Ventral and Incisional hernia repair (IPOM) now days is a method of choice. It has benefits of shorter hospital stay, lesser pain and fixation of a large sized mesh apart from the cosmetic benefit. Although, it remains a challenging procedure more so in re operative abdomen and malignancy. The procedure is expensive as the mesh used is costly along with its fixation devices. Laparoscopic incisional and ventral hernia repair was first

reported by Le Blanc and Booth in 1993. There is considerable learning curve of the procedure and the the surgery is not without problems. When the hernia is repaired by open technique without mesh, the hernia recurs in about 50 % and when open repair is done with mesh insertion, recurrence rate 20 %. At our centre the recurrence is about 0-4 % with an average follow up of 12 months; although long term follow up is required. The recurrence rate is usually higher initially when surgeons are gaining experience as is the risk of enterotomy, which is probably related to the learning curve.(1)

II. AIM-

The aim of this study to evaluate the our experience of Laparoscopic ventral hernia repair on various parameters such as post operative pain, requirement of post op. analgesia, time of hospital stay, recovery and overall outcome. The size of mesh and ease in its placement vies a vies operating time to assess the learning curve.

III. MATERIAL AND METHODS

A total of 25 patients with ventral hernia underwent laparoscopic intraperitoneal onlay mesh (Laparoscopic IPOM) repair between January 2013 to December 2014 in the department of Surgical Gastroenterology at Dr.Ram Manohar Lohia Institute of Medical Sciences, Lucknow by a single surgical team standardizing the procedure and evaluating the experience. 15 female and 10 male patients with the mean age of 52 years (range 35-72) underwent surgery . 12 cases had incisional hernia and 10cases of paraumbilical and 3 umbilical hernia. Of these 7 were recurrent incisional hernia after open mesh hernioplasty, 1 case was post laparoscopic IPOM (Table –I). The mean body mass index BMI was 35 (range 25-45). Single hernia defect was in 22 patients and multiple in 3 (14.1%) cases. All cases were repaired by dual mesh (parietex, covidien, Germany) and tackers were used to fix it after transfascial sutures (Absorbatack, Covidien, Germany). Most of patients were with medical Comorbid diseases such as diabetes mellitus, hypertension, obesity and pulmonary disease. The learning curve was assessed by ease of placement and fixation of the large sized mesh and overall estimation of time taken. The time was divided into time for initial dissection and then for the mesh placement and fixation.

Inclusion criteria- Any patient with ventral hernia who was fit for general anaesthesia. **Exclusion criteria-** Patient unfit for

general anaesthesia, incarcerated bowel loops or any evidence of vascular compromise on imaging and with pregnancy were excluded.

Preoperative preparation- All patients had detailed medical history documented, underwent a thorough physical examination with estimation of the hernia defect. All routine blood parameters including, complete blood counts, renal and hepatic function tests, coagulation profile were evaluated. Patient with medical co morbidities like diabetes, hypertension, underlying malignancy etc., were evaluated and declared fit by them for surgery by specialists physicians. CECT abdomen was done to every patient to confirm the size of defect and its contents and other associated hernia missed on physical examination. (Figure 1)

Surgical technique-

The patient was placed supine position with arm adducted and after induction of general anesthesia single dose of Inj. Augmentin 1.2 gm I/V was given as routine after sensitivity testing. Pneumoperitoneum was created with veress needle at variable position mostly away from hernia (opposite side) depending on the site of defect. Umbilicus or 2 cm below left costal margin in the midclavicular line (palmer's point) were also utilized for initial access(2). Port were introduced in previously non operated area. In case the defect was in lower abdomen the operative surgeons position at head end and when defect site is in upper abdomen the operating surgeons were in between both legs. Usually we used 3 ports, 5 mm visual port for 30 degrees telescope. It was usually the port converted to 12 mm for the placement of large size of mesh. Another two 5 mm port for working were utilized depending on site and size of ventral hernia.(Figure 2) Preoperatively, the margins of hernia defect were marked. Gentle reduction of content and adhesiolysis was done with harmonic scalpel or electrocautery with a combination of blunt and sharp dissection. The margins and periphery of hernial defect was evaluated by direct vision and palpation after complete reduction of contents. (Figure 3) After complete reduction of hernial contents the abdomen was deflated and the margins were reconfirmed. Suitable sized mesh was prepared by placing preplaced non absorbable sutures for transfascial fixation. We routinely used 1 central and 4 peripheral sutures of prolene or nylon. The largest mesh was 30x20 cm mesh and minimum size used in our study was 20 x 15cm. In all patients we used Parietex dual mesh (polyester with collagen-polyethylene glycol-glycerol coating, manufactured by Covidien, Germany). Prepared mesh was rolled then introduced into abdomen through 12 mm port. This was usually the optic port although any port could be exchanged with 12 mm based on the surgeons' preference. The time was recorded starting from placing the mesh in the abdomen and its final fixation. Initially we used 10 mm scope to pass the rolled mesh but over a period of time 12 mm was less cumbersome and incorporated even the biggest mesh easily. The mesh unrolled inside the abdomen taking care of the orientation before fixation. Oxidised cellulose side was kept on visceral surface. The preplaced sutures at the periphery and center were pulled out using transfascial fixation needle (Aesculap, Germany) after very small skin incision. We usually pick the central fixation first as it helps in orientation of a larger sized mesh. These sutures are ligated subcutaneously and required no skin sutures. Mesh is then duly fixed with 5 mm absorbable tackers (covidien) in 2 layers. (Figure 4)

IV. RESULTS-

In our study Laparoscopic intraperitoneal onlay mesh (Laparoscopic IPOM) ventral hernia repair was performed for 25 patients. Out of which 15 were women and 10 were male with the mean age of 52 year (range 35-72) year. In this study hypertension, diabetes, asthma and hypothyroidism was common medical co-morbidity but they have no relation to presence of hernia.

There were 12 incisional and 10 paraumbilical along with 3 umbilical hernias. 7 patients had a recurrent ventral hernia after open mesh hernioplasty and 1 recurrent incisional hernia after laparoscopic intra peritoneal onlay mesh (Laparoscopic IPOM repair) (Table -I). The mean body mass index BMI was 35 (range 25-45). Single hernia defect was in 22 patients and multiple in 3 (14.1%) cases. The maximum diameter of defect range from 4-12 cm. We used 20 x 15cm for small and 30 x 20 cm for large defects. Intra operative blood loss was not significant and there were no conversion to open method. Operative time ranged from 60-130 minutes which decreased with time, overall it revealed that mesh fixation after placement required around 30 minutes and variable time was required for adhesiolysis depending in previous surgeries and adhesions. Umbilical and paraumbilical ventral hernia with minimal adhesions only required 60 minutes of operative time. There were no iatrogenic bowel injuries during procedure. One patient had feeding jejunostomy following a gastrojejunostomy for a benign gastric outlet obstruction. The weitzel loop of bowel had to be brought down for placement of mesh, which was done successfully incising a bit of parities. Post operative heaviness in abdomen and mild pain was the most common complaint, post operative ileus developed in 3(12%) patients which resolved by conservative treatment. 1 patient developed Richter's hernia through the 12 mm port. She was obese lady with diabetes, hypertension and had treatment for Non Hodgkins lymphoma with multiple abdominal surgeries and failed open mesh repair. This was diagnosed on day 4 and was managed by re laparoscopy and reduction of bowel loop. The defect was fixed transfascially under vision. This rare complication has been published. The post operative hospital stay ranged 2-3 days. The average follow up period was 12 months.

V. DISCUSSION-

Ventral and incisional hernias are common long term postoperative complications following abdominal surgery and have an incidence of 3-20 % (3). It is more common in females. Early studies to describe laparoscopic repair of incisional hernia was published in 1993 by Le Blanc and Booth. It offers early recovery, decreased hospital stay, minimal morbidity and very low recurrence. It allows clear identification of multiple hernia defect which could be missed during open hernia repair (4). Minimum mesh overlap should be 4-5 cm from the edge of defect, although; it is suggested that if transfascial sutures were used it could be at least 3 cm (5). This encourages tension free repair and proper overlap of the defect. We used minimum mesh overlap of 4-5 cm on all sides. This was fixed with transfascial

preplaced sutures and absorbable tackers in 2 layers. This allows proper mesh placement and reduces early folding or dislodgement of the mesh, which may be a cause of recurrence. In principle, laparoscopic repair of ventral hernia utilises the same concept as open repair popularised by Stoppa, Rives et al (6,7,8). These include using large mesh prosthesis, adequate overlap of hernia defect with tension free repair. Operating time of laparoscopic ventral repair is longer than open ventral hernia repair although some authors have reported no difference. Laparoscopic ventral hernia repair may be a challenging procedure with long standing defect, incarcerated small bowel, morbid obesity, multiple previous repairs and placement of prosthetic mesh but offers significant benefits of less postoperative pain, shorter hospital stay, early return to work and placement of a large sized mesh which have been confirmed in the various studies. Our study confirms that patient required analgesia routinely on need basis up to 12 hours. Thereafter, only mild discomfort required oral NSAIDs on need basis. They all were mobilised early and tolerated the surgery well. Minor wound infection in one patient, seroma in 2 patients, ileus in 3 patients were complications. Only one patient had significant problem as post operative Richter's hernia through the 12 mm defect which was diagnosed and early relaparoscopy with repair of defect was done successfully. (14). Mesh shrinkage is greater in the tack group as compared with suture group when used individually. Recurrence of hernia following repair is a problem and is reported variably with the usage of different mesh fixation techniques(9,10,11) Carbajo et al mentioned a recurrence rate of 4.4% during a follow up period of 44 months although another study has reported a recurrence rate of 1 % during mean follow up of 27 months(11). In our study there was no major morbidity and no operative mortality. Significantly, in our early experience there were no major complications except occurrence of the port site Richter's hernia in immediate post operative period. We used standardised protocol and similar technique in each case and documented the operative time after adhesiolysis and mesh fixation. This revealed that more or less the time taken for fixation of a large sized mesh was standardized and the time taken for adhesiolysis was dependent on presence of adhesions of previous surgery or mesh placements. In case of simple umbilical hernias the operative time was around 60 minutes for the entire procedure. The placement of large sized prepared mesh was easier through 12 mm port as compared to 10 mm port and we shifted to 12mm after initial 4 cases. The mesh handling was better and preserved the collagen layer from being torn etc. Parietex dual mesh was used in each case. In our scenario, the cost is important and laparoscopic ventral hernia repair is expensive using costly mesh and fixation device. But, the procedure was more patient friendly, with less morbidity, shorter length of hospital stay, no need of drain, less chance of infection and over all similar operative time as compared to open surgery. More so, obese patients with medical co morbidities and recurrent hernias tend to benefit more. Overall there was no early recurrence in the average follow up of 1 yr. We routinely applied abdominal binder for 6 weeks following surgery. 1 patient had excision of redundant skin excision under local anaesthesia after umbilical hernia repair. Therefore, Laparoscopic repair may be termed as better than open repair (12). Pooled data analysis of 45 published series, representing 5340 patients (4582

laparoscopic, 758 open) demonstrate a significantly lower recurrence rate with laparoscopic ventral hernia repair compared with open ventral hernia repair series(13). Although, recurrence still remains an important problem after laparoscopic ventral hernia repair, it does not surpass 5% to 10% in most of series. Overall, the laparoscopic ventral hernia repair offer significant benefits in our setting.

VI CONCLUSION

In this study our early experience was that the Laparoscopic ventral hernia (Laparoscopic IPOM) repair is feasible, safe in most cases with benefits of rapid recovery and better overall patient outcomes more so in large recurrent incisional hernias and malignancy

REFERENCES

- [1] Le Blanc KA, Elieson MJ, Corder JM. Enterotomy and mortality rate of Laparoscopic incisional and ventral hernia repair: a review of literature JLS 2007;11:408-14.
- [2] Palmer R, safety in laparoscopy. J report medicine 1974;13:1-5.
- [3] Hoer J, Lawong G, Kling U. Factor influencing the development of incisional hernia. a retrospective study of 2983 laparotomy patients over a period of 10 year. *chirurgia* 2002;73:474-80.11-5
- [4] Carlsen CG, Garrden M, Lundhus E, Nielsen J. Initial experiences with laparoscopic incisional hernia repair. *ugeskr laeger*. 2009;171:1182-485
- [5] Le Blanc KA. Laparoscopic incisional hernia repair: are trans-fascial sutures necessary? a review of literature. *surg Endosc* 2007;21: 508-13
- [6] Stoppa RE. The treatment of complicated groin and incisional hernia. *world J surg*. 1989;13:545-554.
- [7] Rives J, Pire JC, Flament JB, et al. Treatment of large evantration. new therapeutic indication apropos of 322 case *chirurgie* 1985;111:2.5-225
- [8] Wantz GE, Incisional hernioplasty with mersilene, *surg gynecol - ostet*, 1991;172:129
- [9] Beldi G, Wagner M et al, Mesh shrinkage and pain in laparoscopic ventral hernia repair: a randomised control trial comparing suture verses tack mesh fixation *surg endosc* 2011, 25;749-55.5
- [10] Carbajo MA, Martin delolmo JC, Blanco JI et al. Laparoscopic approach to incisional hernia. *surg Endo* 2003; 17: 118-2
- [11] Gillian et al. GK, Geis WP, Grover G. Laparoscopic incisional and ventral hernia repair (LVHR): an evolving out patient technique. *JLS* 2002;6;315-22
- [12] Hope WW, Lincourt AE, Newcomb L. Comparing quality of life outcome in symptomatic patients undergoing laparoscopic or ventral hernia repair. *J Laparo Adv Surg Tech* 2008;1:567-71
- [13] Piere RA, Spittler JA, Frisella MM, Mathews BD, Brunt LM. Pooled data analysis of Laparoscopic vs open ventral hernia repair: 14 year of patient data accurel. *Surgical Endoscopy*. 2007;21: 378-86
- [14] Pandey A, Masood S, Goel VK, Gupta AK. Richters Hernia after an intraperitoneal mesh repair: *Asian J Endosc surg* 2014;7:330-3

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Table 1. Demographics and characteristics of the patients.

Patient characteristics			
Sex		(male/female)	10/15
Age,mean			52 (35-72)
Type of hernia			
Incisional:			12
Midline			12
Right		paramedian	0
Appendectomy			0
Right		subcostal	0
Paraumbilical hernia			:10
Primary	with	diverication	recti 3
Recurrent			7
Umbilical hernia			3
Epigastric			0
BMI, Mean			35 (25-45)
Comorbidity			20
Defect		size,(cm)	4-12
Operating		time,(min)	60-130
Hospital	stay	(days)	2-3
Average follow up (months)			12
Total No. Of cases			25 (100%)

Table 2. Intra and postoperative complications.

Complications		Number (Percent)
Intraoperative	complication	
Bowel injury		0
Bleeding		0
Difficult dissection		10 (40%)
Conversion to open	open complications	0
Postoperative		0
Haematoma		2 (8%)
Seroma		1 (4%)
Wound infection		1 (4%)
Chest infections		0
Early Recurrence		3 (12%)
Ileus		1 (4%)
Port site Richter's hernia		25 (100%)
Total cases		

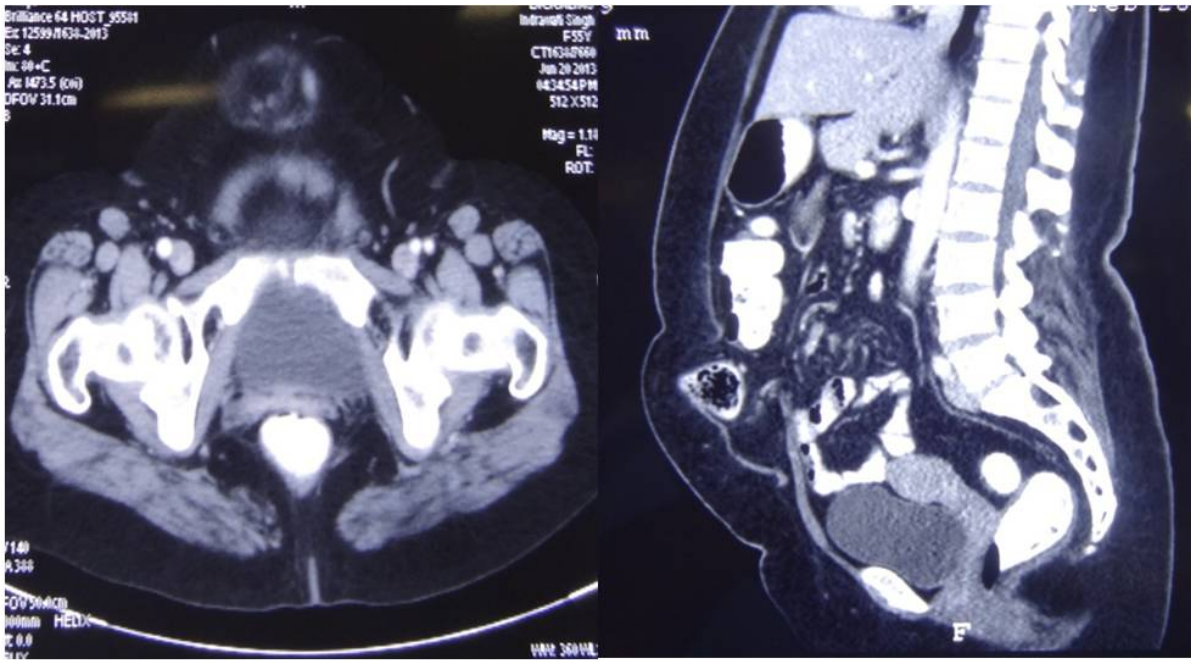


Figure 1. CECT Whole abdomen for the size of defect and content.



Figure 2. Marking for the port placement for working and one camera port

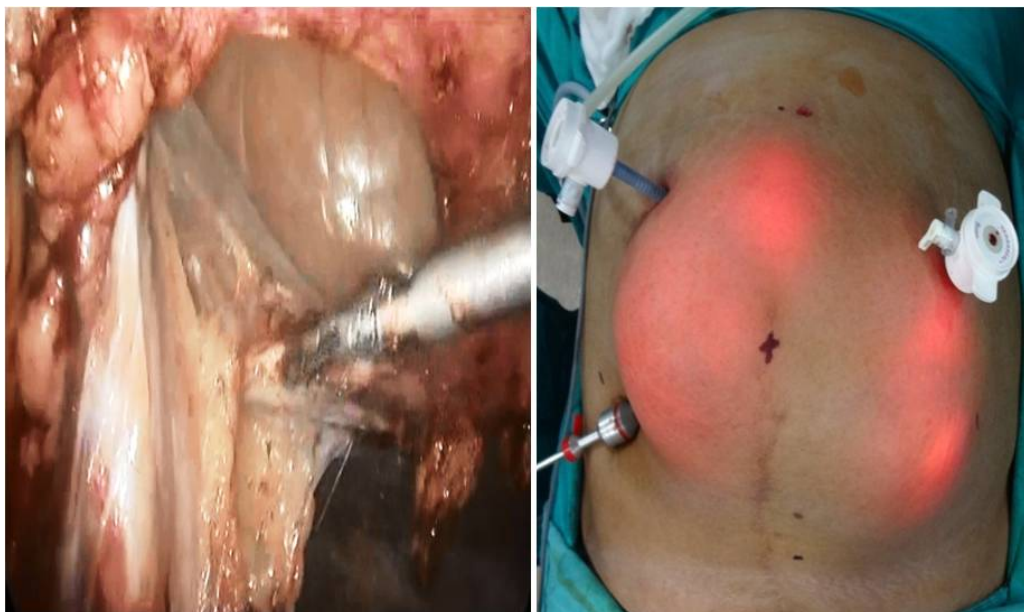


Figure 3. Reduction of the content, transillumination after reduction

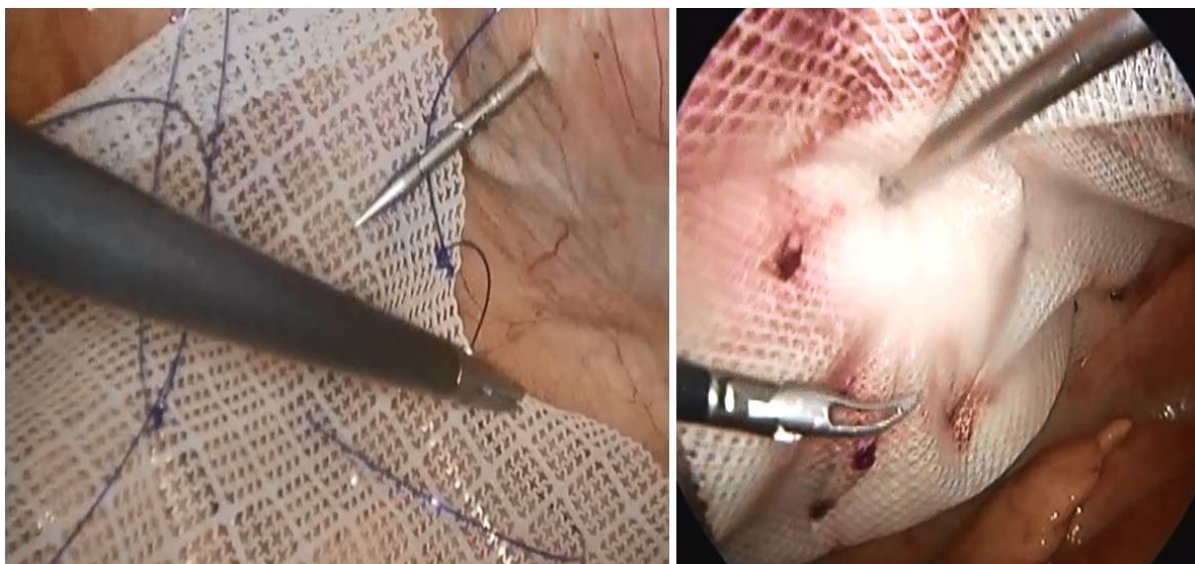


Figure 4. centralization of the mesh with transfascial suture, mesh fixed with absorbotacker