A RETROSPECTIVE COMPARATIVE STUDY OF PREPERITONEAL VS ONLAY MESH REPAIR IN CASES OF VENTRAL HERNIA AT TERTIARY CARE INSTITUTE.

General Surgery

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ABSTRACT

Background: A ventral hernia is an abnormal protrusion of intra abdominal or preperitoneal content through the anterior abdominal wall fascia and muscle defect. Hernioplasty with prosthetic mesh is surgical treatment modality for all types of ventral hernia. There are various anatomic planes where mesh can be put. This study was planned to compare preperitoneal repair and onlay mesh repair in terms regarding their outcome.

Methods: This is a retrospective study with total number of 112 cases of ventral hernia with prosthetic meshplasty was done. In all cases clinical history, preoperative examination findings, intraoperative and post operative findings were noted. All data was categorised according to where mesh was put intra-operatively in anatomical plane of preperitoneal or onlay. Statistical analysis of all data was done and outcome was measured.

Results: Mean operative time was less in onlay hernioplasty than preperitoneal hernioplasty but over all complications were high in onlay hernioplasty. Preperitoneal hernioplasty method had lowest complications rate.

Conclusions: Preperitoneal hernioplasty is better choice than onlay hernioplasty.

AIM: To assess the better method from onlay meshplasty and preperitoneal meshplasty in cases of ventral hernia.

OBJECTIVE: To compare the both methods on the bases of operative time, speed of postoperative period recovery, and postoperative complications.

KEYWORDS

Ventral Hernia, Preperitoneal, Onlay

INTRODUCTION:

Ventral hernia refers to hernias of the anterior abdominal wall. Inguinal and femoral hernias are not included even though they are ventral. Lumbar hernia is included despite being dorsolateral.¹ A ventral hernia is defined by a protrusion through the anterior abdominal wall fascia.² This may be present at birth or acquired from weakening or disruption of the overlying fascia, or from failed healing of a surgical incision.³ These defects can be categorized as spontaneous or acquired.

Nonincisional hernias are named based on their location on the abdominal wall. Epigastric hernias occur from the xiphoid process to the umbilicus, umbilical hernias occur at the umbilicus, and hypogastric hernias are rare spontaneous hernias that occur below the umbilicus in the midline. Acquired hernias typically occur after surgical incisions and are therefore termed incisional hernias.²

Hernias may present as asymptomatic bulges that increase with Valsalva maneuvers, or with significant discomfort. Hernias may reduce spontaneously or with manual pressure. If a hernia is incarcerated, it cannot be reduced and generally requires surgical correction. If intestine is incarcerated in the hernia defect, bowel obstruction may ensue, which represents a surgical emergency. A hernia is considered strangulated if blood supply to its contents is compromised. Localized ischemia may lead to infarction and eventual perforation if left untreated. These hernias are usually small but may be associated with multiple defects. They result from multiple factors, including muscle weakness, congenitally weakened epigastric fascia, or increases in intra-abdominal pressure.³

Surgeon has various options for placing the mesh.

The onlay technique involves primary closure of the fascia defect and placement of a mesh over the anterior fascia. The major advantage of this approach is that the mesh is placed outside the abdominal cavity, avoiding direct interaction with the abdominal viscera. However, disadvantages include the large subcutaneous dissection, the increased likelihood of seroma formation, the superficial location of the mesh (which places it in jeopardy of contamination if the incision becomes infected), and the repair is usually under tension.^{2,5}

The preperitoneal technique involves placing the prosthetic material below the fascial components. The mesh can be placed intraperitoneally, preperitoneally, or in the retrorectus (retromuscular) space. It is highly desirable to have the mesh placed beneath the fascia.

With a wide overlap of mesh and fascia, the natural forces of the abdominal cavity act to hold the mesh in place and prevent migration.^{2,4}

MATERIALS AND METHODS:

Total 112 cases of ventral hernia operated from June 2017 to June 2018 admitted in GCS Medical College and Research Centre, were retrospectively evaluated according to the inclusion exclusion criteria. Two groups were made according to mesh placement in anatomical plane onlay[group A] or preperitoneal[group B]. There were 50 cases operated in which onlay repair were done. There were 72 cases in which preperitoneal repair were done. Outpatient clinical notes, discharge summary, operative notes, and laboratory data were reviewed.

Inclusion criteria for study:

1. All patients having the ventral hernia i.e. umbilical, paraumbilical, spigelian, incisional hernias
2. Age > 18 yr
3. Hernia defect size > 2 cm

Exclusion criteria for study:

1. Age < 18 years
2. Acute incarcerated hernia
3. Infected hernia
4. Patient requiring the other surgical procedure apart from hernia repair in the same setting
5. Patient not fit for the surgery or anesthesia.

RESULTS:

Out of 112 patients, 77[69%] were female and 35[31%] were male, with a female to male ratio of 1.7 to 1. Ages ranged from 18 to 75 years. 40 patients had incisional hernia, 11 patients had epigastric hernia, 60 patients had umbilical hernia and 1 had infraumbilical hernia. [Figure 1 and 2]

Regarding to the duration of surgery in patients treated with onlay mesh repair (Group A) ranged from 46-67 minutes (56.34 mean time). While in patients treated with preperitoneal mesh repair (Group B) it ranged from 79-100 minutes (89.45 minutes mean time) [Figure 3]

There were complications like seroma, superficial surgical site infection, deep surgical site infection and recurrence rate (was decided on 1 year follow up period). The data was calculated and compared with other groups. [Figure 4]

DISCUSSION

Ventral hernia either De novo or recurrent is a common surgical problem and refers to fascial defect of the anterolateral parietal abdominal wall fascia and muscles, through which intermittent or continuous protrusion of intra-abdominal or preperitoneal contents occurs.⁶

Regarding to the duration of surgery in patients treated with onlay mesh repair (Group A) ranged from 46-67 minutes (56.34 mean time) which is shorter than the Alsoudany SM et al.⁷ 75-90 minutes (83.41±10.24) and longer than that reported by Godara et al.⁸ of which the duration of surgery ranged from 30 – 90 minutes (49.35 ± 8.29). [Table 1]

Table 1: Comparison of mean operative time in onlay hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	MEAN OPERATIVE TIME [minutes]
Onlay	Alsoudany SM et al. ⁷	83.41
Onlay	Godara et al. ⁸	49.35
Onlay	Present study	56.34

We recorded the duration of surgery in patients treated with preperitoneal mesh repair (Group B) that ranged from 79-100 minutes (89.45 minutes mean time) which is less than reported by Rajsiddharth B et al.⁹ Who reported mean time of 60.15 minutes, this may be attributable to epidemiological variations of patients. [Table 2]

Table 2: Comparison of mean operative time in preperitoneal hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	MEAN OPERATIVE TIME [minutes]
Preperitoneal	Rajsiddharth B et al. ⁹	60.15
Preperitoneal	Present study	89.45

Seroma is one of the most common complications following open technique and is particularly likely to occur when large skin flaps are developed during the surgical procedure. Although small seromas frequently resolve within 6 to 8 weeks without sequel, a large

symptomatic or persistent seroma occasionally requires multiple aspirations or again have to place the drain if multiple aspirations need to be avoided, as there is increased risk for secondary infection with multiple aspirations attempts.¹²

In this study regarding Seroma formation after drain removal in patients treated with onlay mesh repair (Group A), seroma occurred in 8 patients (16%) which is slightly on higher side than reported by Alsoudany SM et al.⁷ of which 15% of cases of onlay repair developed seroma, similar to that reported by Godara et al.⁸ which was 15% as in same group, but higher than that reported by Kohler et al.¹¹ of which 12.5% of cases developed wound seroma and higher than the study done by Bauer et al.¹⁰ that showed a 5% incidence of seroma. [Table 3]

Table 3: Comparison of seroma in onlay hernioplasty with other type of studies.

HERNIA REPAIR	STUDY	RATE OF SEROMA FORMATION
Onlay	Alsoudany SM et al. ⁷	15%
Onlay	Godara et al. ⁸	15%
Onlay	Bauer et al. ¹⁰	5%
Onlay	Kohler et al. ¹¹	12.5%
Onlay	Present study	16%

Seroma formation after drain removal in patients treated with preperitoneal mesh repair (Group B), occur in 6 of the cases of this group (8.3%) which is lower than that reported by Rajsiddharth B et al.⁹ in which seroma occurred in about 10% of cases and than that reported by Godara et al.⁸ in which seroma occurred in about 22.5% of cases. Which may be attributable to the relatively small number of cases in our study, more number of cases may be required for the same to be more conclusive. [Table 4]

Table 4: Comparison of seroma in preperitoneal hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	RATE OF SEROMA FORMATION
Preperitoneal	Rajsiddharth B et al. ⁹	10%
Preperitoneal	Godara et al. ⁸	22.5%
Preperitoneal	Present study	8.3%

Obese patients, wide areas of dissection, and the presence of devitalized tissues are conditions favouring infection which is a real threat to the successful repair, when suppuration occurs in the wound, drainage and proper antibiotics are essential.¹³

Postoperative wound infection in patients treated with onlay mesh repair (Group A), 5 patients (10%) developed wound infection (1 of them was a major wound infection i.e. deep surgical site infection, necessitated mesh removal and the others showed good response to conservative treatment of opening of wound and regular dressing), which is lower than that observed by Alsoudany SM et al.⁷ of which 15% of cases developed the surgical site infection and reported by Godara et al.⁸ of which 15% of cases developed wound infection. It was significantly lower than that reported by Bauer et al.¹⁰ who reported that wound infection occurred in 23%, but almost similar to that reported by Kohler et al.¹¹ of which wound infection occurred in 9.3% of cases. [Table 5]

Table 5: Comparison of post operative wound infection in onlay hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	RATE OF POST OPERATIVE WOUND INFECTION
Onlay	Alsoudany SM et al. ⁷	15%
Onlay	Godara et al. ⁸	15%
Onlay	Bauer et al. ¹⁰	23%
Onlay	Kohler et al. ¹¹	2.5%
Onlay	Present study	10%

Our study shows that postoperative wound infection in patients treated with preperitoneal mesh repair (Group B), 2 patients (2.8%) developed superficial surgical site infection and no case of deep surgical site infection was noted. This rate is much lower than that observed by Rajsiddharth B et al.⁹ which is 6.66% and that reported by Yaghoobi et al.¹² who reported that infection rate occurred in 11.6 % cases and that reported by Godara et al.⁸ of which 22.5% cases developed wound infection but slightly lower than that reported by Kohler et al.¹¹ of which wound infection occurred in 9.3% cases. [Table 6]

Table 6: Comparison of post operative wound infection in preperitoneal hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	RATE OF POST OPERATIVE WOUND INFECTION
Preperitoneal	Rajsiddharth B et al. ⁹	6.6%
Preperitoneal	Yaghoobi et al. ¹²	11.6%
Preperitoneal	Godara et al. ⁸	22.5%
Preperitoneal	Kohler et al. ¹¹	9.3%
Preperitoneal	Present study	2.8%

Hernia recurrence was observed in patients treated with onlay mesh repair (Group A), 4 patients (8%) developed hernia recurrence within 1 year post-operative period, which is slightly lower than that reported by Bauer et al¹⁰ who reported that recurrence rate is about 10%, and this may be attributable to the shorter period of follow up in our study. But the rate is higher than that reported by Alsoudany SM et al⁷ who reported 5% recurrence rate over the period of 1 year, Kohler et al.¹¹ who reported that recurrence rate of about 3.1% and than that reported by Godara et al.⁸ with no recurrence after a follow-up of minimum 24 months. [Table 7]

Table 7: Comparison of recurrence in onlay hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	RECURRENCE RATE
Onlay	Alsoudany SM et al ⁷	5%
Onlay	Bauer et al ¹⁰	10%
Onlay	Kohler et al. ¹¹	3.1%
Onlay	Godara et al. ⁸	0%
Onlay	Present study	8%

In this study regarding hernia recurrence in patients treated with preperitoneal mesh repair (Group B) 2 cases (2.8%) developed hernia recurrence within 1 year post-operative period. Though in study by Rajsiddharth B et al.⁹ There were no cases of recurrence over the period of 1 year. [Table 8]

Table 8: Comparison of recurrence in preperitoneal hernioplasty with other type of studies.

TYPE OF HERNIA REPAIR	STUDY	RECURRENCE RATE
Preperitoneal	Rajsiddharth B et al. ⁹	0%
Preperitoneal	Present study	2.8%

CONCLUSION

Ventral hernias are very common entity in general surgery practice. The exact knowledge of various types of repairs and their advantages and disadvantages are crucial for successful repair of the hernia. As our study has concluded that preperitoneal repair is better than the onlay type of repair. The larger and more diverse population may require to give the clear mandate to one procedure.

DECLARATIONS

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