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Comparision of Outcome after Open and Laparoscopic Repair of Ventral Hernias

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ABSTRACT: The present study is a prospective non-randomised study comparing open versus laparoscopic ventral hernia repair in the short term. The study consists of two groups, open group, which consists of 31 patients and laparoscopy group with 19 patients. The end points measured in both the groups are seroma formation, wound infection ,edge necrosis,mesh infection, duration of post operative pain using the visual analogue scale, length of hospital stay and reccurence. Laparoscopic ventral hernia repair has shown promising results and a clear advantage over open repair with reduced post operative pain, decreased post operative complications, reduced length of hospital stay, and less time for return to normal activity and better cosmetic results.

I. INTRODUCTION

A hernia is defined as an abnormal protrusion of a viscus or a part of a viscus, lined by a sac through the normal or abnormal opening in the abdominal wall, either to outside or into another cavity.[1]

Ventral Hernia is a protrusion of an abdominal viscus or part of a viscus through the anterior abdominal wall occurring at any site other than the groin. It includes incisional hernias, paraumbilical hernias, umbilical hernia, epigastric hernias and spigelian hernias.[2] Incisional hernias are unique in that they are the only abdominal wall hernias that are iatrogenic. It continue to be one of the more common complications of abdominal surgical procedures and are a significant source of morbidity , with loss of time from productive employment and requiring a reoperation.[3]For many years, the repair of incisional hernia was associated with a high recurrence rate. In more recent years, the introduction of synthetic prosthetic materials has provided the opportunity to perform a tension free repair, thereby reducing the rate of recurrence.[4]

In this modern era of surgery, most of the emphasis is made on decreasing the hospital stay of the patient and also decreasing the post operative morbidity and importance is given to cosmesis. Hence Laparoscopic surgery has gained paramount importance due to its minimally invasive technique, decreased hospital stay and also better cosmesis. The trend toward minimal access surgery (MAS) has prompted general surgeons to orient all operations towards laparoscopic techniques.[5] There is continued debate as to the role of laparoscopy in ventral hernia repair. Although laparoscopic repair has become increasingly popular,the outcomes need further evaluation.[6]

SYNTHETIC MESH.

The ideal mesh is one that is cheap and universally available, is easily cut to the required shape, is flexible, slightly elastic and pleasant to handle.[7] It should be practically indestructible and capable of being rapidly fixed and incorporated by the tissues. It must be inert and elicit little tissue reaction. It must be sterilisable and non-carcinogenic. Polypropylene mesh meets the requirements of the ideal prosthesis and is today the most commonly used material for repair of all types of hernia.[8]

Some Of The Most Commonly Employed Synthetic Meshes.

Absorbable:

Polyglactin 910 (Vicryl mesh) Polyglycolic acid (Dexon mesh)

Non-absorbable:

Polypropylene (Marlex mesh, Prolene mesh, Surgipro, TreJex, VYPRO) Expanded polytetrafluoroethylene (ePTFB) sheet (GORE-TEX®, DuaIMesh®) Polyester (Dacron, Mersilene, Ticron, Parielex)

II. MATERIALS AND METHODS

STUDY DESIGN:

Prospective Study.

SOURCE OF DATA:

The study is obtained from patients who consented to get operated for ventral hernia at NRI Medical College and GENERAL HOSPITAL from period of October 2018 to september 2020.

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METHOD OF COLLECTION OF DATA:
Patients admitted with ventral hernia during October 2018 to September 2020 at NRI Medical College are taken up for this study with the help of relevant history, clinical examination and appropriate investigations.

INCLUSION CRITERIA:
1. Patients presenting with ventral hernias who are managed in our hospital with mesh repair are included after taking a written consent.
2. Presenting with recurrent hernia
3. Patients fit for general anaesthesia

EXCLUSION CRITERIA:
- Lateral hernias
- Obstructed hernia or incarcerated hernia

OBJECTIVES OF STUDY
To compare outcome between open and laparoscopic ventral hernia mesh repair

PARAMETERS
- Seroma
- Infection
- Length of hospital stay
- Reccurence
- Previous surgery
- Previous incision
- Size of defect
- No.of defects
- Fixation of mesh

PROCEDURE
All cases of ventral hernias admitted in general surgery department during the study period operated either by open or laparoscopic mesh repair.

In open repair study two types of mesh fixation are used ,one is onlay in which mesh placed in subcutaneous plane and other is mesh placed over rectus muscle and fixation done to anterior rectus sheath.
In laparoscopic mesh repair mesh placed and fixed intraperitoneally using tackers and sutures.

Preoperative evaluation:
All our patients are evaluated by proper history taking and detailed physical examination. Data collected by proforma. All the patients underwent the routine blood investigations and in our study we got ultrasound abdomen done for all to know the size, number of defects, contents and any other abdominal pathology.

Preoperative preparation:
Patients were kept NPO for about 6-8 hrs. All patients received antibiotic prophylaxis an hour before the surgery.

PROCEDURE
Almost all the patients were operated under spinal anaesthesia. In onlay repair, polypropylene mesh is sutured over the anterior rectus sheath, while in other technique, the mesh is placed in the pre rectus space. The mesh is fixed with non absorbable sutures at 12,6,3,9 o clock positions and corner sutures placed. In pre rectus mesh placement additional continous sutures placed between mesh and anterior rectus sheath. Anterior rectus sheath was closed over the mesh by non absorbable sutures. Suction drain was placed in few cases based on the surgeon‘s choice. Skin and subcutaneous tissue closed in layers.[9]

Procedure for laparoscopic surgery:
All the patients were operated under general anaesthesia. Nasogastric tube was placed for upper abdominal hernia and a Foleys catheter for lower abdominal hernias. Both are removed after the procedure on the operating table

Patient position:
Patient is in supine position.

Position of surgical team:
The operating surgeon stands to the left of the patient with the camera man on his right or left depending on the location of hernia.

Operative technique:
Pneumoperitoneum established by veres needle in palmers point, 2 to 3cm below the left costal margin in the midclavicular line. Adhesiolysis was done using sharp dissection or monopolar diathermy. Defect is delineated. A thread was passed through the 5mm port and the defect size measured intracorporeally. The size of the mesh required is assessed.[10] The area to be covered by the mesh is marked after the pneumoperitoneum is released and the sites for transfacial sutures marked with the defect at its centre. [11] The mesh is prepared, 2 non absorbable ethilon sutures on either side at the upper end and two polypropolene sutures at the opposite end.[12] The mesh is rolled around the grasper and inserted through the 10 mm port. Mesh is opened intraperitoneally and with the use of a spinal needle or cobbler and mesh is

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anchored to the anterior abdominal wall. In some cases we also used tackers in a double crown fashion. At the completion of the procedure, the ports are withdrawn under vision. 10 mm port is closed with 2-0 polyglactin. Skin closed with ethilon 3-0. A compression dressing is placed in the area of defect to reduce the incidence of post operative seroma.

Post operative management:

During post operative period all patients received intravenous aqueous diclofenac injections 12th hrly for 1 day unless contraindicated and there after oral analgesics are given on the patient demand. [13]

Follow up evaluation:

After discharge, patients were encouraged to take normal diet and return to their normal activities as early as possible. After the discharge, patients were followed up at 1 week, 1 month, 3 month, 6 month intervals.

Post operative assessment of pain:

The pain experienced by the patients in immediate post operative period has been graded according to the Visual Analogue Scale (VAS) which ranges from no pain to the worst possible pain on the scale of 0 to 10.[14]

End points of the study:

The end points measured in both the groups are seroma formation, wound infection ,edge necrosis,mesh infection, duration of post operative pain using the visual analogue scale, length of hospital stay and reccurence.

III. RESULTS

In the present study the patients are grouped into two groups.

Group 1: Patients undergoing open mesh repair for ventral hernia.

Group 2: Patients undergoing laparoscopic intra peritoneal mesh repair for ventral hernia. The total number of subjects were 50.

31 patients underwent open mesh repair. In these 31 patients, ten patients have undergone onlay repair. In the rest of the 21 patients, open pre rectus repair was done. Abdominoplasty was performed in six of these 31 patients. 19 patients underwent laparoscopic intra peritoneal mesh repair. 1 patient was converted to open surgery due to dense adhesions and ope onlay technique was performed.

Both the groups are evaluated and compared for post operative pain using the visual analog score (VAS), post operative complications like Seroma, hematoma, mesh infection, length of hospital stay, return to normal activity, recurrence.

Open group :

Type of hernia	Number of patients (n)	Percentage (%)
Umbilical	2	6.45
Paraumbillical	9	29.05
Incisional	20	64.5
Total	31	100

Laparoscopic group :

Type of hernia	Number of patients (n)	Percentage (%)
Epigastric	2	10.5
Umbilical	2	10.5
Paraumbillical	10	52.6
Incisional	5	26.4
Total	19	100

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Distribution of post operative complications

Complication	**Open group (n=31)**		**Laparoscopy group (n=19)**		**P value**
	Number (n)	**Percentage (%)**	**Number (n)**	**Percentage (%)**	
Overall complications	**24**	**77.4**	**4**	**21.1**	**0.08***
Seroma	10	32.2	2	10.5	0.001**
Wound Infection	7	22.6	1	5.3	0.02
Edge necrosis	5	16.1	-	-	-
Mesh Infection	-	-	-	-	-
Chronic Pain	2	6.4	1	5.3	0.588
Reccurence	-	-	1	5.3	

Distribution of hospital stay

Length of postoperative hospital stay (days)	**Open group (n=51)**		**Laparoscopy group (n=31)**	
	Number (n)	**Percentage (%)**	**Number (n)**	**Percentage (%)**
1 – 5	-	-	15	79
6 – 10	10	32.2	3	15.7
11 – 15	12	38.7	1	5.3
>15	9	29.1	-	-
Total	31	100	19	100
Mean	15.17 days		4.64 days	

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Distribution of follow up

Follow Up (months)	Open group		Laparoscopy group	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
3	5	61.2	5	79
6	10	32.3	10	10.5
>6	16	6.5	4	10.5
Total	31	100	19	100
Mean	10.33 months		6.4 months	

IV. CONCLUSION

Laparoscopic ventral hernia repair has shown promising results and a clear advantage over open repair with reduced post operative pain, decreased post operative complications, reduced length of hospital stay, and less time for return to normal activity and better cosmetic results.15 Laparoscopic ventral hernia repair seems to be a safe and feasible alternative to open repair. The drawback in the study was the short period of follow up. Further randomized trials with long term followup are necessary

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