ORIGINAL ARTICLE

Comparative Study between Sublay and Onlay Technique of Repairing Ventral Abdominal Hernia

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ABSTRACT

The purpose of this study is to compare onlay versus sublay repair regarding complications (superficial skin infection and seroma collection). In this comparative study patients of ventral abdominal hernia (n=100) were included. Fifty were in onlay group (Group A) and fifty in sublay group (Group B). In group A patients (onlay) the hernial sac was not opened unless the contents were irreducible. In such conditions the sac was opened and the contents were dissected and reduced, sac was closed, inverted and sutured with vicryl 2/0. An onlay polypropylene mesh was inserted. In Group B (sublay) midline laparotomy incision was given and in cases of incisional hernias excision of the previous scar. Afterwards hernial sac was opened. After adhenolysis the bowels were covered with a towel to avoid any iatrogenic injury to the bowel. A sufficient mesh overlap with a subduction of healthy tissue of at least 6 cm in each direction was provided to avoid recurrence at the edges due to shrinkage of prosthesis. After preparation of the mesh bearing the peritoneal layer was closed with an absorbable running suture. The mesh was then placed into contact with the muscle fibres. Follow up in each group was done for the period of one month with the interval of 7days, 15 days and 30 days. The mean operative time in group A was 50±8 minutes and in group B 60±15.0 minutes. The patients with seroma in group A were 14 percent, 32% and 0% on 7th, 15th and 30th day respectively Superficial surgical site (SSI) in the same group was 17.33%, 6.67% and 0% in 7th, 15th and 30th day respectively. The patients who presented with seroma in group B were 4%, 2% and 0% on 7th , 15th and 30th day respectively .SSI in the same group B were 4 percent , 2% and 0% on 7th, 15th and 30th day respectively. Sublay is better than onlay technique with less postoperative complications, but operative time is slightly greater in sublay technique.

Keywords: Ventral abdominal hernia, sublay technique, onlay technique

INTRODUCTION

Hernia is a protrusion of abdominal viscera through a defect in abdominal wall. Successful repair of abdominal hernias requires thorough knowledge of anatomy of anterior abdominal wall and all its layers. Ventral abdominal hernia includes all the hernias occurring through the anterior abdominal wall excluding groin hernias (incisional hernias, epigastric hernias, paraumblical hernias). Initially high density mesh was introduced with onlay mesh hernioplasty techniques. Afterward, mesh in sublay position, was introduced, without suturing the mesh at the edges of the defect[1,2,3,4]. The prosthetic mesh can be placed between the subcutaneous tissues of the abdominal wall and anterior rectus sheath (onlay mesh repair) as well as in the preperitoneal plane created between the rectus muscle and posterior rectus sheath (sublay mesh repair). The latter technique has several advantages one of being not transmitting the infection from subcutaneous tissues deep down to mesh as it lies quite deep[5]. Mesh implanted in sublay mesh repair unites and consolidates the anterior abdominal wall. The mesh also adheres to the posterior rectus sheath and renders it inextensible allowing no further herniation. The technique is considered as the treatment of choice for the open repair of abdominal incisonal hernias[6,7,8,9].

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PATIENTS AND METHODS

The study time frame was two years starting from October 2012 and November 2014. Total 100 adult patients who were scheduled to undergo hernioplasty for ventral abdominal wall hernias or a first recurrence of hernia at the site of a vertical midline incision to suture repair only after stratification according to the type of hernia were included in this study. This study is conducted in surgical unit I, university teaching hospital, Gujranwala, Pakistan. Fifty were included group A (Onlay) and fifty in group B (Sublay).All patients with ventral hernias were between age 25 to 65years,ventral hernias located in upper and lower midline incisions and patients with incisional hernias resulting from Pfannestiel's incision, were included Patients with chronic obstructive pulmonary disease like asthma, patients

with abdominal malignancies and cirrhosis with end stage liver disease, patients with more than one hernia, patients with prior hernia repair with mesh and defects <4cm were excluded.

The sac was opened and any intraperitoneal adhesions especially those related to inner aspect of anterior abdominal wall were divided. The rectus sheath and the external oblique aponeurosis were exposed . For group A patients (onlay) the hernial sac was not opened unless the contents were irreducible. In such conditions the sac was opened and the contents were dissected and reduced, then the sac was closed.. Following invagination of the sac midline defect was closed en-mass with continuous proline 1/0 sutures. An onlay polypropylene mesh was inserted. The mesh edges were turned over for at least 1cm all around and was chosen to be large enough extending for atleast 6 cm from the edge of the defect from all directions. The upper and lower edge of the mesh were then fixed by a continuous row of proline 2/0. For Group B (sublay) operation starts with midline laparotomy incision and in cases of incisional hernias excision of the previous scar. Since incisonal hernia represents defects in scar tissue formation the entire previous incision was reopened and covered by the mesh. Afterwards hernial sac was opened. For the proper dissection of the pre-peritoneal, retromuscular space where the mesh was positioned, laparotomy was to performed. Rectus sheath was opened around the umblicus and was dissected in cranial and caudal direction. The preparation was continued blunt on the poterior rectus sheath behind the rectus muscle on both sides. The dissection was stopped when an overlap of 5-6 cm to both lateral sides was reached. In the case of paramedian hernias the preparation was continued laterally to the rectus sheath by leaving the rectus sheath dorsally. The preparation was carried out between internal oblique and transverses abdominis muscle. The lateral nerves and vessels of the rectus sheath were handled carefully to avoid damage. A sufficient mesh overlap with a subduction of healthy tissue of at least 6 cm in each direction was provided to avoid recurrence at the edges due to shrinkage of prosthesis. To ensure sufficient overlap in cases of cranial (epigastric) hernias linea alba was dissected without harming the anterior fascial layer. Posterior rectus sheath was cut along the linea alba and the preparation extended behind the xiphoid. It ensured a correct overlap. For infraumblical hernias the preperitoneal preparation was carried out behind the pubic bone. Where necessary the lower part of the mesh was fixed to Cooper's ligament to ensure fixation. Below the arcuate line prosthesis was laid in the preperitoneal space. After preparation of the mesh, bearing the peritoneal layer, it was closed with an absorbable running suture (vicryl 2/0). Direct contact of the mesh with the intestine was avoided, to prevent fistula formation. Where possible bowels were covered with greater omentum. The mesh was then placed into contact with the muscle fibres in the space between the rectus abdominus and posterior rectus sheath. Because of self fixation of mesh only a few 3/0 absorbable stiches were used to anchor. After positioning anterior rectus sheath was closed with proline 1/0 continuous sutures. Two drains were placed in the subcutaneous tissue above the anterior sheath. Follow up, in each group, was done for the period of one month with the interval of 7days, 15 days and 30days.

RESULTS

Majority had a primary incisional hernia (Table 1). Among the patients with primary incisional hernias, 29 were assigned to sublay mesh repair and 28 to onlay mesh repair. Among epigastric hernias 6 patients underwent sublay and 7 onlay. Among paraumblical/umblical 18 underwent sublay and 12 underwent onlay mesh repair (Table 2). The mean duration of follow-up was 1 month and none of the patients were lost to follow up. The mean operative time in group A (Onlay) was 50±8 minutes and in group B (Sublay) was 60±15.0 minutes. The patients presented with seroma in group A were 14%, 32% and 0% in 7th , 15th and 30th day respectively .SSI in the same group are 16%, 8% and 0% in 7th, 15th and 30th day respectively(Table 3). The patients presented with seroma in group B are 4 percent, 2 percent and 0 percent in 7th , 15th and 30th day respectively .SSI in the same group B are 4%, 2%t and 0% in 7th, 15th and 30th day respectively (Table 4). The period of drainage ranged from 3-8 days with the average period being 4-6 days.

Table 1. Type of ventral abdominal hernias

Type of hernia	**n**
Incisional hernia	57
Epigastric hernia	13
Paraumbilical/umbilical hernia	30

Table 2: Type of herniorraphy employed

	Sublay	**Onlay**
Incisional hernia	29	28
Epigastric hernia	6	7
Paraumbilical/umbilical hernia	18	12
Total	53	47

Table 3: Complications in onlay group

Complication	**7th Day**	**15th Day**	**30th Day**
Seroma	14%	32%	0
Superficial surgical infection	16%	4%	0

Table 4: Complications in Sublay group

Complication	7th Day	15th Day	30th Day
Seroma	4	1%	0
Superficial surgical infection	4%	1%	0

DISCUSSION

The techniques used for repairing ventral hernias have generally developed in a practical, experiential way. Several studies, comparing suture with open mesh repair, showed the advantage of a prosthesis resulting in significant lower recurrence rates. Several authors have reported favorable results with onlay mesh repair[10,11].

In techniques for the repair of ventral hernias in which sutures are used, the edges of the defect are brought together, which may lead to excessive tension and subsequent wound dehiscence or incisional herniation as a result of tissue ischemia and the cutting of sutures through the tissues. With prosthetic mesh, defects of any size can be repaired without tension. Polypropylene mesh, by inducing an inflammatory response, sets up a scaffolding, inducing the synthesis of collagen.

In present study the forms used to record the findings of the postoperative examinations did not include information on the type of repair used, but in 10 percent of the cases, only the surgeon who performed the operation evaluated the patient at follow-up. In a thorough examination, the technique performed may be detected, as after mesh repair, a fascial rim can be palpated in some patients with a large fascialdefect.The size of the hernia was an independent risk factor for seroma formation in both the groups. Patients with hernias who had poorly controlled diabetes and evidence of peripheral arterial disease had significantly higher incidence of SSI. An inherent defect in healing, in patients with diabetes mellitus – type 2 and peripheral arterial disease was not known, but possible defects in healing can be envisioned.

The results of present study revealed that mesh in Sublay position should be attached to the defect with an overlap as large as possible. Mesh best be sutured to the surrounding fascia. Bulging must be prevented, but the mesh should not be implanted under tension. Contact between the polypropylene mesh and the viscera must be avoided because of the risk of adhesions, intestinal obstruction, and fistulas. The lowest incidence of post operative complications including recurrence have been published for retromuscular sublay repair[12]. The presence of fluid collection anterior to mesh, usually haematomas or seromas, best not be mistaken for recurrence of hernia[13,14]. The superficial infection rate in our series was 2.9-4.3% which is comparable with the international figure of 3-8%[15,16].

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