ORIGINAL RESEARCH PAPER
Volume - 9 | Issue - 7 | July - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A COMPARATIVE STUDY OF ONLAY VS SUBLAY MESH REPAIR IN VENTRAL ABDOMINAL HERNIA

Surgery

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ABSTRACT

Sublay mesh repair is a better technique for repair of ventral abdominal hernia. Though it takes a bit longer operative time, it is associated with lesser incidence of early and late complications and shows faster recovery and low morbidity.

METHODS

This study was carried out in the department of surgery, PMCH. Patna on patients of ventral hernia. The patients were randomly divided into two groups. In Group A polypropylene mesh was placed over external oblique (Onlay placement) while in Group B the mesh was placed preperitoneally in sublay position and the results were compared.

RESULTS

The mean operative time was found to be higher in onlay group but the overall post-operative stay was higher in the sublay group. Early complications were seen in 48.3% of patients in Onlay Group as opposed to 16.6% in sublay group. Out of these complications incidence of wound infection (10%), flap necrosis (18.3%) and seroma formation (13.3%) was much higher in onlay group. Similarly, late complications like recurrence (6.7% and neuralgia (3.3%) was seen only in onlay group.

KEYWORDS

Onlay, Sublay, Ventral Hernia, Retrorectus, Preperitoneal

INTRODUCTION

Ventral abdominal hernia are one of the common surgical encounters in our surgical practice and most of the surgeons would do some sort of prosthetic mesh implantation for effecting a cure and safe guard against long term recurrence. The two operative techniques most frequently used in open surgical repair of ventral hernia are placing the mesh in onlay or sublay positions. It still is a matter of debate which one is superior. Onlay repair has its advocates as it is easily performed and takes less operative time. The preperitoneal repair (sublay) was first described by Renestopa, Jean Rives, and George Wantz.This repair appears, as per many surgeons, to be the gold standard in the management of ventral hernia as it is associated with few complications and a lower rate of recurrence. The present study was conducted with the objective of comparing Onlay Vs Sublay mesh repair for ventral abdominal hernia to establish local evidence-based practices for our setups.

METHODS

This study was carried out in the department of surgery, PMCH. Patna on patients of ventral abdominal hernia admitted through surgical OPD from August 2016 to July 2018.

Inclusion Criteria:

All patients of ventral hernia including epigastric, para umbilical and incisional hernia between 18 to 65 years of age without sex discrimination

Exclusion Criteria:

1. Patients below 18 years of age,
2. Groin hernia,
3. Complicated hernias viz. obstructed, incarcerated or strangulated hernias,
4. Recurrent hernias,
5. Pregnant patients,
6. Patients with co morbid conditions like diabetes, hypertension, systemic diseases, malignancy, COPD etc. and
7. Incisional hernias with defect more than 6 cm.

After adequate preoperative work up the patient were divided randomly into two groups:

Group A. In this group the mesh was to be placed over external oblique (Onlay placement)

Group B. Here mesh was placed preperitoneally in sublay position.

Operative technique: All operations were undertaken under general anaesthesia and prophylactic amoxicillin clavulanic acid 1.2 gm was given i.v after induction of anaesthesia. An appropriate incision, depending on the site, size and type of hernia was given. In group A full thickness skin flaps up to the anterior rectus sheath were mobilised. The hernial sac was identified, dissected, opened, adhesions released and the contents reduced. The sac was excised and closure of the defect was done with no. 1 Polypropylene sutures without tension. An adequate sized polypropylene mesh, with an overlap of up to about 4-5 cm all around, was fixed with interrupted sutures of polypropylene 2-0. Romovac suction drain was placed and skin closed. In Group B The hernial sac was dealt without wide dissection of skin flaps, which is not required here. After closure of the hernial defect an adequate sized mesh was placed in retrorectus space posterior to rectus muscles but anterior to peritoneum and posterior rectus sheath. Mesh was sewn to hernial edges with prolene 2-0 and spread in that plane to overlap for about 4- 5 cm beyond the edges. Romovac drain was placed in all cases after securing strict haemostasis.

Post operatively patients were managed with aim of early supervised mobilisation and early oral nutrition. Drain was removed when output become less than 20 ml in 24 hours. The stitches were removed on the 8th postop day and the patient discharged. The patients were followed up on OPD basis on 14th and 28th days, monthly for one year and then 3 monthly for one year for any complications like neuralgia and recurrence.

The quantitative variables were analysed using independent sample t-test at 95% confidence level i.e. α=0.05 and the qualitative variables were analysed in 2 x 2 chi square matrix at 95 % confidence level. Hence, the variables whose *p*- value were less than 0.05 were considered statistically significant.

RESULTS

Total number of 120 patients of ventral hernia were included in this study. Both groups included 60 patients each. Breakup of all cases is given in Table 1.

Table 1: Breakup Of Cases

GROUP A (60 CASES)			GROUP B (60 CASES)		
	No. of cases	%		No.of cases	%
Incisional hernia	22	36.7	Incisional hernia	23	38.3
Paraumbilical hernia	14	23.3	Paraumbilical hernia	17	28.3
Epigastric hernia	24	40	Epigastric hernia	20	33.3

Male Female ratio in all cases was found to be 1:2.08 and age range varied from 21 to 65 years.

Summary of observations is presented in Table 2.

Table 2: Summary Of Observations

	GROUP A(n=60)		GROUP B (n=60)		
	No of cases (Range)	%	No of cases (Range)	%	*p-value*
Age(years): Mean±SD Range	47.2±26.6 21-62		45.23±25.8 22-65		
Sex (M: F)	21:39	35:65	18:42	30:70	
BMI: Mean±SD Range	27.12±8.29 25-36		26.89±9.21 24-37		
Operative time(min): Mean±SD Range	46.25±15.25 45-70.5		62.15±12.34 60.2-90.5		*0.001*
Size of defect(cms): Mean±SD Range	3.2±0.79 2-6		3.1±0.85 2-6		
Hospital stay (days): Mean±SD Range	12.23±10.15 8-21		9.2±3.56 8-12		*0.029*
Early complication	29	48.3	10	16.7	*0.002*
Wound infection	6	10	2	3.3	*0.143*
Flap necrosis	11	18.3	0	0	*0.002*
seroma	8	13.3	3	5	*0.113*
Haematoma	4	6.7	5	8.3	*0.120*
Late complications	6	10	0	0	*0.051*
recurrence	2	3.3	0	0	*0.558*
neuralgia	4	6.7	0	0	*0.170*

The mean operative time in Onlay group was 46.25±15.25 minutes and 62.15±12.34 minutes in sublay group. And the total hospital stay was 12.23±10.15 and 9.2±3.56 days in Onlay and Sublay groups respectively. Early complications were seen in 48.3% of patients in Onlay Group as opposed to 16.7% in sublay group. Out of these complications incidence of wound infection (10%), flap necrosis (18.3%) and seroma formation (13.3%) was much higher in onlay group. Similarly, late complications like recurrence (3.3% and neuralgia (6.7%) was seen only in onlay group.

DISCUSSION

The ventral hernias may be repaired by primary closure, primary closure with relaxing incisions, primary closure with onlay mesh placement, only onlay mesh placement, inlay mesh placement, and sublay mesh placement. But any defect which is more than 3 cm necessitates the placement of some sort of mesh to prevent recurrence. And an excellent method is Rives-Stopa technique, where mesh was placed between the peritoneum and abdominal wall or rectus muscle and posterior rectus sheath. Fibrous tissue ingrowth in the mesh pores consolidates the abdominal wall and widely disperses intraabdominal pressure as per the Pascal's law. Thus, sublay technique decreases the recurrence rates and gives a better outcome, and has been described to be the standard of care for ventral hernias. Laparoscopic surgery and component separation techniques are also other alternatives popular with many under certain indications.

In this study of a total of 120 patients, 60 patients each underwent operation by Onlay and Sublay techniques. Majority of patients in this study were found to be females (M: F: 1:2.08) with age ranging between 21 to 65 years. The mean operative time in Onlay group was 46.25±15.25 minutes and 62.15±12.34 minutes in sublay group with a p-value of 0.001 which is highly significant. Servinc et al. (2018) also observed a lower operative time in onlay group (56.7± 15.7min) as opposed to sublay group((73.9±14.2 min) with a p value of <0.001.The total length of hospital stay was 12.23±10.15 and 9.2±3.56 days in Onlay and Sublay groups with a p-value of 0.029 which is significant. Radwa M. et al. (2019) made a similar observation of post-operative stay to be 8±2 and 7±1 days in Onlay and sublay groups respectively. However, Godara et al. (2006) observed mean duration of hospital stay as 4.6±1.30 and 6.8±1.50 days in Onlay and Sublay groups.

Early complications were seen in 48.3% patients of Onlay Group as opposed to 16.7% in sublay group with a p-value of 0.002 which is very significant. Ibraham T. et al. (2018) reported complications of 33.3% and 12.82% with p value of 0.032 in onlay and sublay groups respectively. Demetrashvili et al also reported rate of complications of 50% and 22.1% in onlay and sublay groups respectively with a p value of < 0.001 which clearly shows that incidence of complications are much higher in onlay technique. Flap necrosis was seen in 18.3% of cases in onlay group as opposed to zero occurrence in Sublay group , which is very much significant (p value of 0.002).Wound infection and seroma were seen in 10% and 13.3% in onlay and in 3.3% and 5% in Sublay group, respectively, with a p-value of 0.143 and 0.113, which is though higher in onlay group but statistically considered not to be very significant. Radwa M. et al reported wound infection in 6% of cases in onlay group as opposed to 2% in Sublay group. Gordara et al. also reported a higher incidence of wound infection in onlay group (22.5% of the case in the onlay group and only 4% of cases in the sublay group). Post-operative haematoma was seen in 6.7% and 8,3% of cases in onlay and sublay groups, respectively, which is higher in sublay group but again statistically not supposed to be much significant(p-value of 0.120).On the other hand late complications (viz. recurrence and neuralgia , seen in 3.3% and 6.7% of cases,respectively,in onlay group as opposed to its total absence in sublay group) were seen to be higher in onlay group with incidence of 10% as opposed to zero in sublay group, which also is statistically significant(p-value =0.05).Radwa M. et al found a recurrence rate of 4% in Onlay group and no recurrence in sublay group. Hameed et al., Godara et al. and Kohler et al. also observed nil recurrence rate in sublay group.

Goda et al. proposed that retromuscular space already exists in anatomical plane requiring no dissection, and the bare posterior surface of the rectus muscles is rich in lymphatic, which is capable of absorbing any collecting seroma. El-Santawy observed that implantation of prosthetic mesh remains the most efficient method for dealing with any ventral hernia especially sublay technique as it has several advantages, and one of the most important is not transmitting the infection from subcutaneous tissues to the mesh, as it lies deep in the preperitoneal space

CONCLUSION

Sublay mesh repair is a better technique for repair of ventral hernia with less chances of infection and erosion through the skin as it lies between rectus muscle and posterior rectus sheath and peritoneum. It avoids adhesion to bowel and intestinal obstruction and enterocutaneous fistula and is associated with low rate of complications, shorter hospital stay and overall low morbidity. However, it is more time consuming and techniquely more demanding.

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