

Comparison between Sublay & Onlay Mesh hernioplasty in Ventral Wall Abdominal Hernia Repair

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ABSTRACT

Background & Aim: Onlay and sublay repairs are the two surgical methods most commonly employed in ventral hernia patients. The repair of a ventral hernia is one of the most common surgical procedures performed globally. The results of simple ventral hernia onlay and sublay mesh repair methods were compared in this study to compare the results of onlay and sublay mesh ventral incisional hernia repair procedures. To investigate the frequency of seroma, wound infection, and wound disruption in patients with ventral abdominal hernias who had onlay and sublay mesh plasty. Incisional hernia (IH) is a very common surgical complication.

Study design: Prospective Randomized Control Trial

Place and duration of study: This study was done in department of General surgery at Central Park teaching Hospital, Lahore during a period of 4 months that span from October 2021 till January 2022.

Methodology: This prospective research included 100 adults with primary or secondary uncomplicated ventral hernias. The onlay mesh repair procedure was used in both groups B (n = 50) and A (n = 50). We randomly assigned participants to one of two therapy groups using a computer-generated randomization process. The procedure's length, the length of the drain, the duration of any wound infections, the length of the post-op hospital stay, and any short-term recurrence were all noted.

Results: When compared to the sublay group, the onlay group had a substantially shorter median operational time (52 vs. 91 min., respectively). However, in terms of wound complications and postoperative pain, the sublay group beat the control group significantly. Disease recurrence occurred in 8% and 3% of patients in groups A and B, respectively.

Practical Implication: Sublay mesh repair, which is an alternative to onlay mesh repair, can be used to treat all types of ventral hernias.

Conclusion: Sublay mesh repair, which is an alternative to onlay mesh repair, can be used to treat all types of ventral hernias. Mesh-related issues are associated with long drainage times, seroma development, wound infection, and recurrence. In terms of postoperative discomfort and wound complications, sublay mesh repair is preferred than onlay mesh repair for treating incisional hernias. The recurrence rates of the two procedures are comparable.

Keywords: Ventral Hernia, Onlay Mesh Repair, Sublay Mesh Repair

INTRODUCTION

A ventral abdominal wall incisional hernia is a defect in the layers of the abdominal wall.¹ Primary or incisional ventral abdominal wall hernias are among the most often performed surgical operations worldwide.² It is estimated that 250,000 ventral hernia repairs are performed in the United States alone each year. Incisional hernias are estimated to occur at a rate of 2-11% overall and 10-20% in certain series.^{4,5} General surgeons face a huge difficulty due to the high recurrence rate, high cost, and high morbidity associated with incisional hernia surgery.⁶ Despite the frequent necessity for surgical repair, physicians continue to struggle to obtain ideal results, and surgical failure is alarmingly prevalent (10-30%).³ True recurrence rates are almost certainly overstated.⁴ Recurrence, the hernia surgeon's greatest nightmare, escalates healthcare costs and adds further financial hardship on patients.⁶ Given that a ventral hernia is caused by the biological issue of stable scar tissue development, mesh techniques are currently the leading therapies for hernia repair.⁷ In order to prevent recurrences, facial autografts, prosthetic materials, and various meshes were all employed to assist the repair.⁸ For ventral hernia repair (onlay and sublay procedures), open surgery with prosthetic mesh is considered the gold standard.^{1,7} Although open mesh repair is preferable to suture repair, there is still debate on where the mesh should be patched.^{8,9} The significant recurrence rate of ventral incisional hernia primary suture repair led surgeons to this conclusion. Following strict adherence to the standards for incisional hernia repair, there is controversy about whether to implant the mesh onlay or sublay.¹ Wound problems such as seroma formation and wound infection exacerbate mesh morbidity. The incidence of post-operative problems caused by mesh repair, in order to better investigate the best strategy to manage these

hernias.^{2,3} In situations of ventral hernia, the two surgical procedures that are most commonly used are onlay and sublay repairs. Several studies suggest that the sublay method is significantly more effective than the onlay, with lower recurrence and complication rates.^{5,6} This study's major goal was to compare the early and late results of onlay and sublay mesh repair procedures. Suture surgeries have a high recurrence rate, although mesh deployment can reduce recurrence.^{5,9} Many operations, according to research, have exceptionally high risks of particular outcomes, such as recurrence, wound infection, and fistula.^{1,2} There are several reported procedures for hernia repair, however tension free mesh installation is the most often used nowadays. Meshplasty is classified into two types: onlay and sublay.⁴ Mesh is put on the anterior rectus sheath in an onlay approach; mesh is inserted between the rectus sheath and the peritoneum in a sublay therapy.⁵ Some argue that sublay mesh plasty is superior to onlay mesh plasty.^{6,7}

MATERIALS AND METHODS

The current study included 100 patients with uncomplicated paraumbilical, epigastric, and umbilical hernias utilising a simple continuous random sample procedure. The patients were then allocated into two groups of 50 each using a lottery approach. Patients in Group A had onlay mesh repair, whereas patients in Group B received sublay mesh repair. The study excluded patients who had infraumbilical incisional hernias or strangulation at the time of presentation. Operative time, drainage time, seroma development, and purulent wound infection were secondary end goals. The onlay repair was performed under general anaesthetic with a skin incision covering the bulge or defect. The rectus sheath and the defect holding the hernia contents were both detected after

blunt dissection. After repairing the line Alba defect with a non-absorbable stitch, a proline mesh of the appropriate size was placed to the rectus sheath and fastened with sutures. The two main components of the preperitoneal or sublay mesh repair were mesh extension far beyond the hernia defect and mesh implantation deep into the rectus muscles. The gap and preperitoneal plane between the posterior rectus sheath and the rectus muscle were discovered when the sac was split and marked for mesh implantation. The previously created plane behind the rectus is filled with a suitably sized proline mesh. the 1/0 polypropylene sutures that surround the anterior rectus sheath. Before the skin was closed, another drain was placed on the subcutaneous plane. To minimise bias, each patient received 1 gm of a third-generation cephalosporin antibiotic during induction and continued to receive it twice daily until the fifth postoperative day.

The demographic information of the patient, BMI, the size of the facial defects, the length of the procedure (from the first incision to the dressing), the VAS scores at the second and 24th hours, the length of the hospital stay, the time it took to remove the drains, and any postoperative complications or recurrences were all recorded. For each procedure, the elective standard was followed.

RESULTS

In terms of demographic data, there was no statistically significant difference between the two groups in terms of age, gender, unique habits, and body mass index [BMI], implying that the groups may be split based on age and BMI. A median age of 55.4+11. The distribution of age and gender within the groups was comparable. The average BMI of all patients was 25.9+3.5 kg/m², with minimal variation between the groups. Both groups had the similar mean hernia defect.

Table 1. Displaying the separation of the two groups according to age and BMI.

Age	<50	28	32	P=0.47
	>50	22	18	
Sex	Male	08	06	P=0.31
	Female	42	44	
BMI	<25	28	25	P=0.41
	<30	12	15	
	>30	10	10	

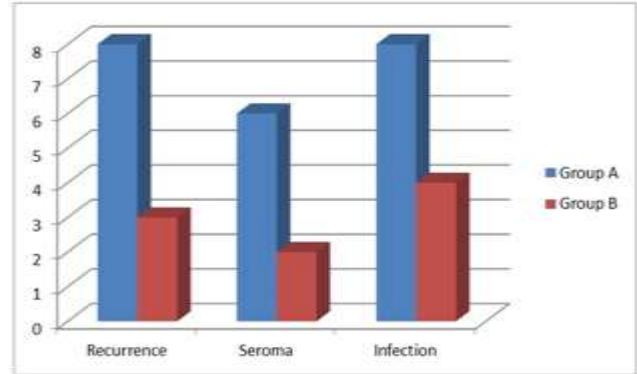
Group A took 67.04+13.19 minutes on average, ranging from 45 to 90 minutes, but Group B took 93.26+24.94 minutes on average, ranging from 60 to 140 minutes (P = 0.001).

In terms of drainage time, group A had a mean total time in days of 7.47+1.7 days (range: 5-10 days), whereas group B had a mean total time in days of 4.5+1.1 days (range: 3-6 days), with a significant variance (P=0.0001). Six patients in Group A had seromas, Two patients in Group B experienced seroma, which was discovered via ultrasonography and treated conservatively.

In groups A and B, eight and four patients, respectively, developed purulent wound infections that were treated with suitable antibiotics following culture sensitivity and dressings.

Comparison of both groups in terms of OT time, LOS, Pain score, drain removal				
		Group A (n=50)	Group B (n=50)	P ²
OT Time (Min)		56.7+15.7	7.39+14.2	0.0001
LOS (Days)		3.36+1.9	3.52+2.6	0.734
VAS score	2 nd Hour	7.38+1	6.9+1	0.031
	24 Hour	2.9+1	2.5+0.8	0.010
Drain removal (Days)		5.4+2.3	3.2+11	0.0001

Disease recurrence was observed in 8% and 33% of patients in groups A and B, respectively, during the course of the follow-up period, with an unremarkable distribution (P=0.05).



The female to male ratio was 1.6:1. (Table 1). Onlay surgery took 75+90 (83.41+10.24) minutes on average, whereas sublay surgery took 80+10 (89.52+7.25) minutes (P = 0.324).

The suction drain was left in place in all onlay and sublay circumstances. Following drain removal, 15% of patients in Group A developed wound seroma.

DISCUSSION

To address the persistent problem of ventral hernia repair in surgical practise, a wide range of surgical procedures have been developed, ranging from direct suture techniques to the use of various types of mesh to seal the defect and fortify the tissues in order to reduce recurrence.⁸ In the late 1980s, mesh placement in the retro muscle sublay position with the hernia defect overlapping in both directions was first used.⁹ Because it lowered recurrence rates and offered superior outcomes, the enhanced sublay technique has been designated the gold standard of treatment for ventral hernias.⁹ Earlier studies discovered that sublay operations took longer to perform than onlay techniques due to the time required to build the preperitoneal tunnel.⁹ Because the onlay treatment required a much longer operating time for patients in the sublay group, our results are consistent with prior published research. In terms of the number of days required to completely drain the discharge produced by various surgical problems, onlay procedures took substantially longer than sublay approaches. Several research with a similar emphasis found significant differences in onlay and sublay techniques, which agree with our findings.⁸

Seroma formation after abdominal wall hernia therapy is a common complication that can result in substantial morbidity.^{1,3} According to previous research, the rate of seroma formation in sublay repair is significantly lower than in onlay repair. The onlay treatment is associated with a greater risk of wound infection, which remains one of its most prevalent adverse effects, with incidence rates ranging from 6-12%. In the current study, we discovered that patients in the sublay group had a lower risk of wound infection than those in the onlay group, however this difference was not statistically significant.

Despite research finding no association between problem or recurrence rates and mesh position, this debate continues. Nonetheless, wound complication rates for onlay and sublay mesh repair surgeries (16% and 12%, respectively) were equal, according to Glassmen.¹⁰⁻¹⁸

CONCLUSION

Sublay mesh repair, which is an alternative to onlay mesh repair, can be used to treat all types of ventral hernias. Sublay mesh repair was shown to be superior than onlay mesh repair in terms of postoperative pain and complications, and equivalent in terms of recurrence rate in this prospective analysis with a median follow-up of 12 months. Sublay mesh plasty beat onlay mesh plasty in terms of fewer complications in this research. Sublay mesh repair can take the place of onlay mesh repair. This research backs up this

strategy for ventral hernia repair because it can address all parts of the disease. The rectus sheath acts as a partial cover for the mesh, which is also attached to the rectus sheath. The risks of complications and recurrence are relatively low. We advocate for further mesh repair studies, with more participants and a longer follow-up period.

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