



## COMPARATIVE STUDY BETWEEN ONLAY AND SUBLAY MESH REPAIR IN THE TREATMENT OF VENTRAL HERNIAS

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**ABSTRACT**

**Objectives:** To compare the outcomes of Onlay and Sublay mesh repair in the treatment of ventral hernias in terms of duration of surgery and early postoperative complications like seroma, surgical site infections, flap necrosis.

**Design:** Observational Comparative study. **Material and method:** From 1st Sept 2021 to Sept 30th 2022, a one prospective study was done at a rural medical college. A total of 50 patients with ventral hernias meeting the inclusion & exclusion criteria were enrolled in the study, with 25 patients in each group. Data was recorded in proformas. The data was analyzed using SPSS version 22. **Results:** Out of the 50 patients enrolled in the study, 25 patients underwent Sublay Mesh repair & 25 patients underwent Onlay Mesh Repair. The most common post op complication observed in our study was seroma , which was seen in 5 patients: 1 (4%) were in Sublay group and 4 (16%) in Onlay mesh repair group. Wound infection was seen in 3 cases. Out of these, 1 (4%) were in Sublay group and 2 (8%) were in Onlay group. Flap necrosis was seen in 4 cases , all belonging to Onlay group The mean duration of surgery was 67 minutes in Onlay group while the mean duration of surgery was 78 minutes in Sublay group. **Conclusion:** Our study concludes that Sublay Mesh repair is superior to Onlay Mesh repair in terms of post operative complications, although associated with a longer duration of surgery.

**KEYWORDS :** ventral hernia, Sublay Mesh repair, Onlay Mesh repair**INTRODUCTION:**

Ventral hernias are a common occurrence in clinical practice, with a reported incidence of 2-10% in the general population. These hernias are characterized by the protrusion of abdominal contents through a weakened area in the abdominal wall. Ventral hernias can be classified based on their location, size, and content. The most common types of ventral hernias include umbilical, epigastric, incisional, and Spigelian hernias.

The treatment of ventral hernias requires surgical intervention. A popular technique that was used was the Mayo's Repair.

But this technique was associated with a high recurrence rate.<sup>1</sup>

Mesh repair was introduced and is now one of the most common approaches used. The advantages of mesh repair have been confirmed by Luijendijk et al.<sup>2</sup>

There are two main techniques for mesh placement in ventral hernia repair, namely Onlay and Sublay.

The aim of this study is to compare the outcomes of Onlay and Sublay mesh repair techniques in the treatment of ventral hernias.

Onlay mesh repair is a technique in which the mesh is placed on top of the defect and fixed to the surrounding tissues. Sublay mesh repair is a technique in which the mesh is placed beneath the rectus muscle and above the posterior rectus sheath.<sup>3</sup>

The introduction of Sublay mesh repair has drastically the recurrence rates and provided improved outcomes and has been the standard of care of ventral hernias.<sup>4,5</sup>

Sublay mesh repair is considered superior<sup>6</sup> because the mesh is placed with significant overlap under the muscular abdominal wall and it works according to Pascal's principles of hydrostatics.

The intra-abdominal cavity functions as a cylinder, and, thus, the pressure is distributed uniformly. Thus, the same forces that are attempting to push the mesh through hernia defects are also holding the mesh in place against the intact abdominal wall. In this way, the prosthetic mesh is held firmly in its place by the intra-abdominal pressure. The mechanical strength of the prosthetic mesh thus prevents protrusion. Over time, the prosthetic mesh is now joined into the fascia and unites with the abdominal wall, which is now without an area of weakness.

Seroma formation is a common complication after abdominal wall hernia repair, which can be a cause of significant morbidity.

With Onlay repair, skin flaps must be created, which increases the risk of wound complications and mesh infection. However, Onlay repair is technically easy to perform.

Sublay meshplasty is technically more difficult than Onlay meshplasty, thus making the operative time longer in the Sublay group. However, Sublay meshplasty is limited in patients with damaged posterior rectus sheath or damaged rectus abdominis muscle, which will render this space difficult to create.

**Objectives:**

To compare Sublay Mesh Repair and Onlay Mesh Repair outcomes in terms of post-operative complications and duration of surgery.

**Materials and methods**

This study was conducted between 2021 and 2022. The study enrolled 50 patients with ventral hernias, with 25 patients in each group. The patients were randomly assigned to receive either Onlay or Sublay mesh repair.

Inclusion criteria for the study were as follows: Patients with ventral hernias, aged between 18 and 70 years

**Exclusion criteria were:** Infraumbilical hernias, patients with significant comorbidities that could affect the outcomes of the study , immunocompromised patients.

All patients underwent hernia repair using either Onlay or Sublay mesh repair technique.

Outcomes measured were recorded in terms of duration of surgery and early postoperative complications like seroma, surgical site infections, flap necrosis.

**Statistical analysis method:** All data was collected in paper-based case report forms and then it was entered in Microsoft excel 2016 format. Frequency tables and measures of central tendency (mean) and measures of dispersion (standard deviation) were obtained by using the software IBM SPSS version 20. Proportions were compared using Chi-square test and continuous variables were compared using student t test. A p-value of less than 0.05 was considered statistically significant.

**Results and Discussion:**

The study was a single centric, prospective, observational comparative study conducted in a rural medical college india, after obtaining permission from the Institutional Ethics Committee. The study is titled: "Comparative Study Between Onlay And Sublay Mesh Repair In The Treatment Of Ventral Hernias"

In our study 32% were in age group of 31-40 followed by 24% in 41-50 years.

**TABLE 1 : AGE DISTRIBUTION**

Particulars	Frequency	Percent
Below 30yrs	7	14.0
31 to 40yrs	16	32.0
41 to 50yrs	12	24.0
51 to 60yrs	9	18.0
61yrs & above	6	12.0
Total	50	100.0

There was no statistical difference in age distribution in both groups. Out of 50 patients enrolled, 12 (24%) were males and 38 females (76%)

**TABLE 2: Types of Ventral Hernia**

Particulars	Frequency	Percent
Epigastric	1	2.0
Incisional	30	60.0
Umbilical	19	38.0
Total	50	100.0

**Duration**

In our study, the average length of surgery for instances undergoing Onlay mesh repair was 67 minutes, but the average length of surgery for cases undergoing Sublay Mesh repair took longer at 78 minutes. The difference could be explained by the longer dissection time needed to produce a retromuscular space.

Aly Saber et al<sup>7</sup> reported the mean length for Onlay and Sublay mesh repair 67.5 and 100 minutes respectively.

Furat et al<sup>8</sup> reported a mean duration of 64 minutes for Onlay and a mean duration of 88 minutes for Sublay mesh repair, while the operative time reported by. Kharde et al.<sup>9</sup> in there study for Sublay mesh repair (77.8 min) was more than that required for Onlay mesh repair (69.8 min).

**Incidence of Seroma**

Seroma was the most common post-operative complication in our study, affecting 5 patients. 4 (16%) were in the Onlay mesh repair group, while 1 (4%) were in the Sublay group.

Due to the substantial subcutaneous dissection required to place the mesh, which can result in devitalized tissue with seroma formation or infection, the Onlay technique had a higher rate of seroma formation.

**SSI**

Three cases had wound infections. One (4%) belonged to the Sublay group, and two (8%) belonged to the Onlay group.

Antibiotics were given to these patient. Because the infection was superficial and responded well to antibiotics, no patient required mesh removal.

Onlay and Sublay were found to have seroma levels of 12% and 1%, respectively, by Furat Shani, 6% and 2%, respectively, by Aly Saber, and 16% and 12%, respectively, by Kharde K et al.

**Flap Necrosis:**

Among 25 patients of Onlay group, flap necrosis was reported in 4 patients compared to no incidence in Sublay mesh repair. This can be concluded from the fact that Onlay Mesh repair requires dissection below the subcutaneous plane for the mesh placement.

**Table 6 : Comparison with other studies**

	Furat Shani		Kharde K		Aly Saber		Our study	
	Onlay	Sublay	Onlay	Sublay	Onlay	Sublay	Onlay	Sublay
No. of patient	52	50	25	25	100	100	25	25
Time of operation min	(64)	(88)	(69.8)	(77.8)	(67.5)	(100)	(67)	(78)
Seroma	12%	1%	16%	12%	6%	2%	16%	4%
Wound infection	2%	1%	4%	0%	8%	4%	8%	4%

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Wound infection	2%	1%	4%	0%	8%	4%	8%	4%

**CONCLUSION:**

In conclusion, ventral hernias are a common problem and require surgical intervention to prevent complications such as bowel obstruction, strangulation, and perforation. Mesh repair is currently the gold standard for treating ventral hernias, and there are different techniques that can be used such as Onlay and Sublay mesh repair.

These findings suggest that Sublay mesh repair is a more effective technique for the treatment of ventral hernias compared to Onlay mesh repair in terms of lesser risk of infection & seroma formation. Although the duration of surgery is increased, it is translated to better patient care.

Overall, the choice of mesh repair technique should be individualized and based on the patient's specific clinical situation, surgeon preference, and experience. A careful evaluation of the risks and benefits of each technique should be considered when selecting the optimal approach for each patient.

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