



A COMPARATIVE STUDY BETWEEN ONLAY VERSUS SUBLAY (RETRORECTUS) MESH REPAIR IN VENTRAL HERNIA

General Surgery

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ABSTRACT

Background: An abdominal ventral hernia is a hole in the muscle of the abdominal wall that is not in the inguinal or hiatus areas. In medical practice, ventral hernias are common. An estimated 15 to 20 percent of people get abdominal hernias. Aim and objectives: To make a comparison between the result of sublay and onlay procedure in mesh repair of ventral hernia. **Methods:** A total of 80 patients were included with Group A(40 patients) who underwent onlay meshplasty, while Group B (40 patients) underwent sublay(retrorectus) meshplasty. **Results:** In our study of onlay versus sublay repair Onlay mesh repair $2.75\text{cm} \pm 1.445\text{cm}$, sublay mesh repair $4.325\text{cm} \pm 2.178\text{cm}$, as such for bigger defect sublay was preferred than onlay mesh repair. It takes longer to do sublay mesh repair (88 minutes $\pm$ 23 minutes) than onlay mesh repair (75 minutes $\pm$ 16 minutes), with a p value of 0.0044 ($p < 0.05$, significant). **Conclusion:** In our study, overall sublay repair technique is more effective than onlay repair technique.

KEYWORDS

onlay meshplasty, sublay(retrorectus) meshplasty, ventral hernia

INTRODUCTION

An abdominal ventral hernia is a hole in the muscle of the abdominal wall that is not in the inguinal or hiatus areas. In medical practice, ventral hernias are common.^[1] An estimated 15 to 20 percent of people get abdominal hernias.^[3]

Polypropylene mesh is used for surgical repair, and it can be put over the front of the rectus sheath (onlay) or the space behind the rectus (sublay).^[4]

Different types of these hernias can be put into two groups: newer and incisional. They can be fixed with fascial autografts, artificial materials, and meshes of different types, such as polypropylene mesh.^[3]

They are known as the ventral hernias: "epigastric hernia, parastomal hernia, spigelian hernia, lumbar hernia, and severe hernia. The major ventral hernia may be subdivided into two central ones (epigastric and umbilical) and two lateral ones (spigelian and lumbar)". This is according to the location of the hernia.^[4]

Because they usually happen after surgery, acquired hernias are also known as incisional hernias,^[2,5] Some occurs due to occupations in strenuous work, diseases like chronic cough, long term constipation, prostatomegaly.

Since the districts of Eastern have maximum tribal population^[6] and lowest literacy rate^[7], it becomes evident for us to conduct our study here.

Aim : To make a comparison between the result of sublay and onlay procedure in mesh repair of ventral hernia.

Objectives:

- To determine the post-operative complications in onlay versus sublay repair.
- To study recurrence rate of ventral hernia between two technique (onlay versus sublay) of ventral hernia repair.
- To evaluate better surgical method for repair of ventral hernia.

Materials and methods:

This comparative study was conducted at zydus hospital, dahod over a period of one year. The study included patients presenting This study was carried out in the Department of general surgery in a Tertiary healthcare hospital of Eastern Gujarat. The material for the study was taken from the cases admitted in the surgical ward of the department of general surgery. Patients falling within selection criteria was randomly stratified as two groups onlay and sublay placement of mesh in ventral

hernia surgery with equal number of patients in each group. Written informed consent was obtained from all participants prior to enrollment.

A total of 80 patients were included in the study, allocated into two groups with equal distribution. Group A consisted of 40 patients who underwent onlay meshplasty, while Group B included 40 patients underwent sublay(retrorectus) meshplasty

The study endpoints included assessment of postoperative complications like pain, seroma, wound infection, wound gaping, hematoma, mesh infection, paralytic ileus, recurrence were recorded. duration of drain placement, length of hospital stay, post operative ambulation were evaluated. Recovery was evaluated based on time taken to resume routine activities. Patient satisfaction and overall clinical outcome were assessed to determine the superior procedure between onlay and sublay (retro rectus) mesh repair.

Inclusion criteria:

- All ventral hernia were included with uncomplicated hernia.
- All age of patients were taken in for study without gender discrimination, who were willing and providing consent or whose blood relatives or family members or guardian were willing and providing consent to participate in this study.

Exclusion criteria:

- Pregnancy
- Patient who did not give consent had been excluded from the study
- Patients with liver cirrhosis, end stage liver disease, chronic renal disease, myocardial infarction
- Patients with uncontrolled diabetes
- Patients with any malignancy
- Ventral hernia turn out to be complicated hernia, strangulated and obstructed hernia were excluded.
- Inguinal, femoral, obturator, parastomal and lumbar hernias were excluded.

RESULTS

The research involved 80 individuals, consisting of 40 patients in Onlay Repair and 40 in Sublay Repair. In the Onlay Repair group, the average age was 47.325 ± 12.23 years, whereas in the Sublay Repair group it was 50.6 ± 12.5 years. The predominant age category was 41–50 years (34%), with the next highest being those aged 51 to 60 years and older (25%). The study population was predominantly made up of female participants (65%), whereas males represented 35%.

Hypertension was the most common comorbidity (5%) followed by Diabetes mellitus (3.75%). whereas Ischemic heart disease was found

in (1.25%). Hypothyroidism accounted for the highest percentage of etiology (2.5%).

TABLE 1 : Demographic And Base Line Character Comparison Between Two Groups

DEMOGRAPHIC AND BASE LINE CHARACTER	ONLAY REPAIR (n=40)	SUBLAY REPAIR	P VALUE
VARIABLE			
Age	47.325±12.23	50.6±12.5	-
Gender(M/F)	13/27	15/25	-
Diabetes	3	0	0.0775
Hypertension	3	1	0.305
Ischemic heart disease	1	0	0.5
Hypothyroidism	1	1	1

In our study compared onlay and sublay repair of ventral hernia repair, there were big differences in how long the surgery took for each method. It takes longer to do sublay mesh repair (88 minutes±23 minutes) than onlay mesh repair (75 minutes±16 minutes), with a p value of 0.0044 (p<0.05, significant). In our study of onlay versus sublay repair Onlay mesh repair 2.75cm ± 1.445cm, sublay mesh repair 4.325cm ± 2.178cm, as such for bigger defect sublay was preferred than onlay mesh repair.

TABLE 2: Comparison Of Operative Details Between Two Groups

OPERATION DETAILS	ONLAY	SUBLAY	P VALUE
Operative Time	75±16	88±23	0.0044
Size Of Defect	2.75±1.445	4.325±2.178	0.0003

In our study of ventral hernia etiology umbilical hernia has highest incidence of 37.5%, followed by epigastric hernia 30%, in others combines (double ventral hernia) present.

TABLE 3: Prevalence Of Type Of Hernia

Types Of Hernia	n=80(100%)
Incisional	11(13.75%)
Spigelian	2(2.5%)
Umbilical(Most Prevelant)	30(37.5%)
Paraumbilical	10(12.5%)
Epigastric	24(30%)
Others	3(3.75%)

In our study onlay mesh repair patient had seroma in 13 patient highest followed by wound infection in 8 patients. Whereas in sublay repair had seroma in 8 patient highest followed by wound infection in 3 patient. Which is not significant by comparing two groups. Hospital stay for onlay repair patient had 5.75±5.12 days, sublay repair 4.025±1.7 days which is significant by comparing two groups. Post operative ambulation day in onlay repair had 2.15±1.09 days, sublay repair had 1.7±0.68 days, duration of drain placement in onlay repair had 6 ± 1.48 days, sublay repair 4.33±1.84 days which is significant by comparing two groups.

TABLE 4: Comparison Of Post Operative Outcome In Two Groups

POST OPERATIVE OUTCOMES	ONLAY REPAIR (n=40)	SUBLAY REPAIR (n=40)	P VALUE
Hospital Stay(Mean±Sd)	5.75±5.12 days	4.025±1.7 days	0.0466
Post Operative Ambulation (Mean ±Sd)	2.15±1.09 days	1.7±0.68 days	0.0297
Duration Of Drain	6 ± 1.48 days	4.33±1.84 days	0.0393
Seroma(N)	13	8	0.2039
Wound Infection(N)	8	3	0.1045
Hematoma(N)	2	0	0.1521
Pain(N)	1	0	0.3143
Mesh Infection(N)	0	0	1
Paralytic Ileus(N)	0	0	1
Wound Gaping(N)	1	1	0.8359
Recurrence(N)	0	0	1

DISCUSSION

In our study of onlay mesh repair versus sublay mesh repair Majority

of patients were in the age group of 41 to 50 years 34% followed by 51 to 60 years 25%. In our study mean for onlay repair is 47.32 years and for sublay repair is 50.6 years. Radwa at el, study shows age mean is 60.55 years. There was no statistically significant difference between the two study groups based on age however.^[4]

In our study of onlay versus sublay mesh repair 65% were females and 35% were males. In each of our study groups, two-thirds of individuals with a ventral hernia were women (65%, or 52 out of 80; onlay 27, sublay 25). There was no statistically significant difference between the two study groups based on sex however. Radwa at el, 65% were females, 35 % were males in 100 study size.^[4] Raghuveer mn at el, male:female sex is 6:94. all study shows distribution of ventral hernia is much more common in females.^[3]

In our study postoperative ambulance days 2.15±1.09 days for onlay mesh repair and 1.7±0.68 days for sublay mesh repair found.

In our study of onlay versus sublay repair 6 ± 1.48 days, passed after the drain was taken out in the onlay group and 4.33 ± 1.84 days, in the sublay group. This is a significant difference (p=0.039). The length of time a patient stays in the hospital after surgery is an important factor for comparing how well different treatments work because it shows how sick the patient is and whether or not there are any complications after surgery. Raghuveer mn at el, study shows mean drainage duration time is 5.97 ± 1.24 days in onlay repair, 4.22 ± 0.99 days in sublay repair which almost similar result to our study. Which shows significance in comparison.^[3]

In our study of onlay versus sublay mesh repair Patients in the onlay group stayed in the hospital for an average of 5.75 ± 5.12 days, while patients in the sublay group stayed for an average of 4.025 ± 1.7 days (p = 0.0466). In the past few years, there has also been disagreement about how long people should stay in the hospital after having a ventral hernia mesh treatment. There are different stories in the surgical literature about how long patients need to stay in the hospital in order to compare sublay and onlay mesh repair techniques, Raghuveer mn at el, study shows 6.68 mean duration in onlay repair and 4.8 in sublay repair. Which is almost same result as our study also significance in comparison.^[3]

It takes longer to do sublay mesh repair (88 minutes±23 minutes) than onlay mesh repair (75 minutes±16 minutes), with a p value of 0.0044 (p<0.05, significant). A lot of dissection is needed to make the right anatomical lines for mesh placement during surgery for ventral hernias that uses prosthetics. This could lead to the collection of serous or hemorrhagic fluids after surgery, so it is recommended, but not required, that a drain be placed for a certain amount of time after surgery. Radwa at el, operative time for onlay mesh repair mean 50 minutes, for sublay repair mean 70 minutes.^[4]

In our study of onlay versus sublay repair Onlay mesh repair 2.75cm ± 1.445cm, sublay mesh repair 4.325cm ± 2.178cm, as such for bigger defect sublay was preferred than onlay mesh repair. Radwa at el, mean size defect for onlay mesh repair is 3.8 cm and sublay mesh repair is 3.7 cm.^[4]

The main problems that happen after mesh repair of ventral hernias are seroma and skin infection. Several scientific papers say that seroma happens more often with the onlay technique than with the retro-muscular way. More often seroma forms after onlay mesh treatment. This could be because the subcutaneous tissue is cut more deeply during surgery or because the mesh is tightly attached to the subcutaneous tissue.

CONCLUSION

Sublay repair has a higher relation to defect size than onlay repair ways in terms of the comfort of the patient. It applies to such items as postoperative ambulation, hospitalization, and drainage. In the case of abdominal hernias, retro rectus repair technique is a bit superior to the onlay type repair technique. However sublay repair is related to longer operating time as compared to that of onlay repair the surgeon is also supposed to possess the required level of skill, which is required in sublay repair. It may bring a lot of problems when it is not managed by someone who has the experience. But patient with comorbidities where faster closure is necessary then onlay mesh repair is better than sublay mesh repair as sublay mesh repair takes longer time.

Sublay repair also has shorter post operative drain placement time with faster recovery which can lead to better outcome of the patient by usage of this technique. Sublay repair has less post operative complication with early ambulation time with less hospital stay. less drainage time can be factor for lesser pain related to drain. In our study, overall sublay repair technique is more effective than onlay repair technique.

REFERENCES

1. Smith J, Parmely JD. Ventral Hernia. [Updated 2023 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK499927/>
2. Hassan F, Gaurav K, Kumar K, Kumar K, B B, N V, Mehta MK, A P. A Comparative Study of Elective Sublay Versus Onlay Repair for Non-complex, Small, and Medium-Size Incisional Hernia: Post-operative Complications in a Tertiary Hospital in Ranchi, India. *Cureus*. 2024 May 3;16(5):e59593. doi: 10.7759/cureus.59593. PMID: 38832181; PMCID: PMC11144578.
3. Shah DK, Patel SJ, Chaudhary SR, Desai NR. Comparative study of onlay versus sublay mesh repair in the management of ventral hernias. *Updates Surg*. 2023 Oct;75(7):1991-1996. doi: 10.1007/s13304-023-01532-5. Epub 2023 May 17. PMID: 37195549
4. Mohamed RM, Rabie OM. Comparative study between onlay and sublay repair of ventral hernia. *Al-Azhar Assiut Medical Journal*. 2019 Jan 1;17(1):96-102.
5. Raghuveer MN, Muralidhar S, Shetty H, Veena V. Onlay versus sublay mesh repair for ventral hernia. *International Surgery Journal*. 2018 Feb 26;5(3):823-6.
6. Shekhar H, Jindal R, Mukherjee S, Sharan J. Open onlay versus sublay mesh repair in ventral hernias—a comparative study. *International Journal of Contemporary Medicine Surgery and Radiology*. 2021;6(1):A74-.
7. Comparative study between onlay and sublay repair of ventral hernia. *AlAzhar. Assiut Med J*. 2019;17:96- 102. 4. Alobaidi MH, Alammam NR. Comparative Study Kamble S, Narayan P, Pan
8. Kamble S, Narayan P, Panndey A, Verma V, Das C. Assessment of Levels and Trends of HIV Infections among Different Subgroup Populations of Gujarat State—Prioritization of the Districts. *Indian Journal of Public Health*. 2023 Jul 1;67(3):364-9.
9. Shah S, Desai S, Desai T, Szkwardo D, Desai G. Trends and risk factors in tribal vs nontribal preterm deliveries in Gujarat, India. *AJOG Global Reports*. 2021 Nov 1;1(4):100026.