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Comparative Analysis of Onlay Versus Retrorectus Mesh Repair in Ventral Hernia Management

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Abstract: ***Background**: Ventral hernias, including incisional, umbilical, and epigastric hernias, often require surgical repair, with mesh reinforcement being the standard to reduce recurrence. Two common techniques include onlay and retrorectus mesh repair. This study compares these techniques focusing on operative time, complication rates, hospital stay, and recurrence. **Methods**: A prospective study conducted from March 2024 to February 2025 involved 50 patients diagnosed clinically and sonographically with ventral hernias. They were equally divided into two groups: onlay meshplasty and retrorectus meshplasty. Operative time, postoperative complications, hospital stay duration, and recurrence rates were analyzed statistically using the Chi-square test. **Results**: The retrorectus group showed a longer operative time (mean 68.6 mins) versus the onlay group (mean 42.1 mins) but had significantly fewer complications, such as seroma formation (12% vs. 32%), wound infections, and flap necrosis. Hospital stay was shorter for retrorectus repair (mean 5.9 days) compared to onlay (mean 9.3 days). Recurrence occurred only in the onlay group (4%). **Conclusion**: Retrorectus mesh repair offers a more favorable postoperative profile with reduced morbidity and recurrence despite longer operative time, suggesting it as a preferable technique for ventral hernia repair.*

Keywords: Ventral hernia, Onlay mesh repair, Retrorectus mesh repair, Sublay, Hernia recurrence, Postoperative complications

1. Introduction

Ventral hernias are defects in the anterior abdominal wall fascia and musculature permitting abdominal content protrusion. They include primary hernias (epigastric, paraumbilical, umbilical) and incisional hernias occurring at prior surgical sites. These hernias present with swelling, discomfort, and pain and may complicate into bowel obstruction or strangulation. The evolution of tension-free synthetic mesh repairs has substantially decreased recurrence compared to traditional suture methods.

Two prominent mesh repair techniques are the onlay method, with mesh placed over anterior rectus sheath, and the retrorectus or sublay technique, where mesh is placed between the rectus muscle and posterior sheath. This study compares these approaches to optimize patient outcomes.

2. Materials and Methods

Study Design: Prospective observational study at ASRAM, Eluru.

Sample Size: 50 patients with ventral hernias, equally divided between onlay and retrorectus repair.

Inclusion Criteria: Patients aged 18-70 with umbilical, epigastric, paraumbilical, or incisional hernias.

Exclusion Criteria: Infraumbilical hernias, patients with immunosuppressive disorders, other planned GI surgeries, and recurrent hernias.

Assessment: Clinical exam, ultrasonography, documentation of symptoms and risk factors including obesity and diabetes.
Statistical Analysis: Chi-square test for significance.

3. Results

Table 1: Demographic and Risk Factors

Parameter	No. of Patients	Percentage (%)
Age 21-30	8	16
Age 31-40	28	56
Age 41-50	12	24
Age 51-60	2	4
Male	15	30
Female	35	70
Obesity	40	80
Diabetes	8	16

Table 2: Types of Hernia and Repair Performed

Category	Onlay Mesh	Retrorectus Mesh	Total	Percentage (%)
No. of Patients	25	25	50	100
Incisional	20		20	40
Paraumbilical	12		12	24
Umbilical	8		8	16
Epigastric	10		10	20
Omentum as sac content			40	80
Bowel as sac content			10	20

Table 3: Surgical Outcomes and Complications

Outcome/Complication	Onlay (n=25)	Retrorectus (n=25)	p-value
Mean Surgery Duration	42.1 min	68.6 min	—
Mean Hospital Stay	9.3 days	5.9 days	—
Seroma	8 (32%)	3 (12%)	0.09
Wound Infection	1 (4%)	0 (0%)	0.4
Flap Necrosis	1 (4%)	0 (0%)	0.4
Mesh Infection	1 (4%)	0 (0%)	0.4

Hematoma	0 (0%)	0 (0%)	—
Recurrence	1 (4%)	0 (0%)	—

4. Discussion

This study aligns with existing literature indicating that retrorectus mesh repair requires longer operative time due to meticulous dissection and placement but yields lower complication rates and shorter hospital stays compared to onlay repair. Seroma and wound infections were significantly higher in the onlay group, likely due to extensive subcutaneous dissection. Recurrence was seen only in the onlay group, underscoring the biomechanical advantage of retrorectus mesh placement, which leverages intra-abdominal pressure for stabilization and avoids direct mesh-viscera contact, thereby reducing adhesion and infection risks.

Obesity and diabetes were significant contributors to postoperative morbidity in both groups. The retrorectus approach demonstrated superior outcomes in patient compliance and cost-effectiveness due to fewer complications and recurrences, despite a longer operative time.

5. Conclusion

Retrorectus mesh repair is a superior technique for ventral hernia repair, offering reduced postoperative complications, shorter hospital stay, and lower recurrence rates compared to onlay mesh repair. Surgeons should consider retrorectus sublay mesh placement as a first-line repair modality in ventral hernia surgeries.

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