



Original Research Article

OPERATIVE EFFICIENCY AND COMPLICATION PROFILE OF ONLAY COMPARED WITH PREPERITONEAL MESH REPAIR IN ADULT UMBILICAL HERNIA

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ABSTRACT

Background: Umbilical hernia is a common anterior abdominal wall defect in adults with potential for complications such as incarceration and strangulation. Mesh repair has become the standard of care, with onlay and preperitoneal mesh placement being commonly used techniques. However, controversy persists regarding the optimal mesh plane with respect to operative efficiency and postoperative outcomes. **Aim:** To compare operative efficiency and postoperative complication profile of onlay mesh repair with preperitoneal mesh repair in adult umbilical hernia.

Materials and Methods: A prospective comparative study was conducted in a tertiary care hospital including adult patients with uncomplicated umbilical hernia. A total of 200 patients were enrolled, and 64 patients were randomized into two groups: Group A (onlay mesh repair, n=32) and Group B (preperitoneal mesh repair, n=32). Operative time, intraoperative events, postoperative pain, drain duration, hospital stay, complications, and recurrence were evaluated. Statistical analysis was performed using independent t-test and Chi-square/Fisher's exact test with significance set at p<0.05.

Results: Onlay mesh repair demonstrated significantly shorter operative duration compared with preperitoneal repair. However, postoperative pain scores, drain duration, and hospital stay were significantly lower in the preperitoneal group. Wound complications such as seroma, hematoma, and surgical site infection were more frequent in the onlay group, while recurrence was observed only in the onlay group but without statistical significance. The overall composite complication rate was significantly higher following onlay repair.

Conclusion: Preperitoneal mesh repair, although technically more demanding and time-consuming, offers superior postoperative recovery with fewer complications and a trend toward lower recurrence compared with onlay mesh repair. It may therefore be considered the preferred technique for elective adult umbilical hernia repair when surgical expertise permits.

Keywords: Umbilical hernia. Onlay mesh repair. Preperitoneal mesh repair.

INTRODUCTION

Umbilical hernia is defined as the protrusion of intra-abdominal contents through a weakness in the

umbilical region of the anterior abdominal wall. Although commonly encountered in infancy, the majority of adult umbilical hernias are acquired and result from increased intra-abdominal pressure acting on a congenitally weak umbilical scar.

Predisposing factors include obesity, multiparity, chronic cough, ascites, heavy physical activity, and advancing age. Adult umbilical hernia represents an important clinical entity due to its potential to progress from a simple reducible swelling to incarceration, obstruction, strangulation, and rarely gangrene, thereby necessitating timely surgical intervention.^[1]

Historically, primary suture repair techniques such as the Mayo repair were widely practiced for small defects. However, these techniques are associated with tension on fascial edges, impaired tissue perfusion, and a significantly higher recurrence rate, especially in defects larger than 1–2 cm. The introduction of prosthetic mesh has dramatically transformed the surgical management of ventral and umbilical hernias by providing tension-free repair, reducing recurrence rates, and improving long-term outcomes. Consequently, mesh reinforcement has become the gold standard for elective umbilical hernia repair.^[2]

Mesh placement techniques vary depending on the anatomical plane of insertion. Among open repair techniques, onlay mesh placement involves positioning the prosthesis superficial to the anterior rectus sheath after closure of the fascial defect. This method is technically straightforward, avoids entry into deeper tissue planes, and is widely practiced, particularly in resource-limited settings. However, it requires extensive subcutaneous dissection, which may predispose to seroma formation, surgical site infection, flap necrosis, and prolonged drain duration.^[3]

In contrast, preperitoneal (sublay) mesh repair involves placement of the mesh between the posterior rectus sheath/peritoneum and the rectus muscle. This technique offers several theoretical advantages, including better mesh integration, lower infection rates due to reduced subcutaneous dissection, decreased postoperative pain, and improved biomechanical reinforcement of the abdominal wall. Nevertheless, the preperitoneal approach is technically more demanding, requires greater surgical expertise, and may be associated with longer operative time.^[4]

Aim: To compare operative efficiency and postoperative complication profile of onlay mesh repair with preperitoneal mesh repair in adult umbilical hernia.

Objectives

1. To compare duration of surgery and intraoperative events between onlay and preperitoneal mesh repair.
2. To evaluate postoperative outcomes including pain, drain duration, hospital stay, and early complications.
3. To assess recurrence and overall effectiveness of both mesh placement techniques.

MATERIALS AND METHODS

Source of Data

Data were collected from adult patients diagnosed with umbilical hernia admitted to the Department of General Surgery of a tertiary care hospital. All eligible patients undergoing elective surgical repair were included after obtaining informed consent.

Study Design

The study was conducted as a prospective randomized comparative study.

Study Location

The study was carried out in the Department of General Surgery at a tertiary care teaching hospital.

Study Duration

The study was conducted over a period of 24 months.

Sample Size

64 patients were randomly allocated for comparative analysis:

- Group A: Onlay mesh repair (n = 32)
- Group B: Preperitoneal mesh repair (n = 32)

Inclusion Criteria

- Patients aged 18–70 years
- Diagnosed cases of primary uncomplicated umbilical hernia
- Patients willing to undergo elective surgery and follow-up

Exclusion Criteria

- Obstructed or strangulated hernia
- Recurrent hernia after previous mesh repair
- Patients with cirrhosis and ascites
- Pregnancy
- Immunocompromised patients

Procedure and Methodology

After clinical evaluation and routine investigations, patients were randomized into two groups. Pre-anesthetic assessment was performed prior to surgery.

Group A (Onlay repair): The hernia sac was dissected and excised. Fascial defect was closed using continuous non-absorbable sutures. A polypropylene mesh with adequate overlap was placed over the anterior rectus sheath and fixed with interrupted sutures. Subcutaneous suction drain was placed.

Group B (Preperitoneal repair): After sac dissection, preperitoneal space was developed bilaterally. Polypropylene mesh with adequate overlap was placed in the preperitoneal plane and anchored to the rectus sheath. The anterior fascia was closed and a suction drain placed if required.

All patients received perioperative antibiotic prophylaxis and standardized postoperative analgesia. Drain removal was done when output was <10 ml/day, and follow-up was performed at 1, 3, and 6 months.

Sample Processing

Data regarding operative time, intraoperative findings, postoperative pain scores, drain duration, hospital stay, complications, and recurrence were

recorded using a structured proforma and followed during scheduled visits.

Statistical Methods

Data were analyzed using appropriate statistical software. Continuous variables were expressed as mean $\pm$ standard deviation and compared using independent t-test. Categorical variables were expressed as percentages and analyzed using Chi-

square or Fisher's exact test. A p-value <0.05 was considered statistically significant.

Data Collection

Data were collected prospectively using a predefined proforma including demographic details, clinical presentation, operative parameters, postoperative outcomes, and follow-up findings.

RESULTS

Table 1: Baseline Profile of Study Population

Variable	Onlay (Group A) n=32	Preperitoneal (Group B) n=32	Effect size (95% CI)	Test of significance	p-value
Age (years), Mean $\pm$ SD	52.4 $\pm$ 11.8	51.7 $\pm$ 12.1	MD = 0.70 (-5.27 to 6.67)	Independent t-test (Welch)	0.816
Male sex, n (%)	18 (56.3)	17 (53.1)	OR = 1.13 (0.42 to 3.04)	Fisher's exact	1.000
BMI (kg/m ²), Mean $\pm$ SD	27.6 $\pm$ 3.9	27.2 $\pm$ 4.1	MD = 0.40 (-1.60 to 2.40)	Independent t-test (Welch)	0.691
Diabetes mellitus, n (%)	6 (18.8)	5 (15.6)	OR = 1.25 (0.34 to 4.59)	Fisher's exact	1.000
Hypertension, n (%)	7 (21.9)	6 (18.8)	OR = 1.21 (0.36 to 4.11)	Fisher's exact	1.000
Obesity (BMI ≥ 30), n (%)	8 (25.0)	7 (21.9)	OR = 1.19 (0.37 to 3.79)	Fisher's exact	1.000
Defect size (cm), Mean $\pm$ SD	2.2 $\pm$ 1.1	2.1 $\pm$ 1.0	MD = 0.10 (-0.43 to 0.63)	Independent t-test (Welch)	0.705

Table 1 demonstrates the baseline demographic and clinical characteristics of patients undergoing onlay and preperitoneal mesh repair. The mean age of patients in the onlay group was 52.4 $\pm$ 11.8 years, compared with 51.7 $\pm$ 12.1 years in the preperitoneal group, showing no statistically significant difference (MD 0.70; 95% CI -5.27 to 6.67; p=0.816). Male predominance was observed in both groups, with 56.3% males in the onlay group and 53.1% in the preperitoneal group, which was comparable (OR 1.13; p=1.000). The mean BMI was also similar

between groups (27.6 $\pm$ 3.9 vs 27.2 $\pm$ 4.1 kg/m², p=0.691). Comorbidities such as diabetes mellitus and hypertension showed no significant intergroup difference, with diabetes present in 18.8% vs 15.6% and hypertension in 21.9% vs 18.8% of patients in onlay and preperitoneal groups respectively (p=1.000). Obesity prevalence was comparable (25.0% vs 21.9%, p=1.000). Additionally, the mean hernia defect size was similar in both groups (2.2 $\pm$ 1.1 cm vs 2.1 $\pm$ 1.0 cm, p=0.705).

Table 2: Operative Efficiency and Intraoperative Events

Variable	Onlay (Group A) n=32	Preperitoneal (Group B) n=32	Effect size (95% CI)	Test of significance	p-value
Duration of surgery (minutes), Mean $\pm$ SD	48.9 $\pm$ 3.1	72.1 $\pm$ 4.7	MD = -23.21 (-25.22 to -21.20)	Independent t-test (Welch)	$<0.001^*$
Estimated blood loss (mL), Mean $\pm$ SD	68 $\pm$ 22	72 $\pm$ 25	MD = -4.00 (-15.77 to 7.77)	Independent t-test (Welch)	0.499
Excessive bleeding, n (%)	3 (9.4)	2 (6.3)	OR = 1.45 (0.26 to 7.92)	Fisher's exact	1.000
Visceral injury, n (%)	0 (0.0)	0 (0.0)	NA	NA	NA

*Statistically significant at p <0.05 .

Table 2 compares operative efficiency and intraoperative events between the two surgical techniques. The mean duration of surgery was significantly shorter in the onlay group (48.9 $\pm$ 3.1 minutes) compared with the preperitoneal group (72.1 $\pm$ 4.7 minutes), demonstrating a statistically significant difference (MD -23.21; 95% CI -25.22 to

-21.20; p <0.001). Estimated intraoperative blood loss was comparable between groups (68 $\pm$ 22 mL vs 72 $\pm$ 25 mL, p=0.499). Excessive bleeding was observed in 9.4% of onlay cases and 6.3% of preperitoneal cases, which was not statistically significant (p=1.000).

Table 3: Postoperative Outcomes

Variable	Onlay (Group A) n=32	Preperitoneal (Group B) n=32	Effect size (95% CI)	Test of significance	p-value
VAS pain Day 1 (0-10), Mean $\pm$ SD	7.91 $\pm$ 1.32	5.15 $\pm$ 0.99	MD = 2.76 (2.18 to 3.34)	Independent t-test (Welch)	$<0.001^*$
VAS pain Day 3, Mean $\pm$ SD	5.32 $\pm$ 1.01	3.19 $\pm$ 0.78	MD = 2.13 (1.68 to 2.58)	Independent t-test (Welch)	$<0.001^*$

VAS pain Day 5 / discharge, Mean $\pm$ SD	3.77 $\pm$ 0.91	1.09 $\pm$ 0.54	MD = 2.68 (2.30 to 3.06)	Independent t-test (Welch)	<0.001*
Drain duration (days), Mean $\pm$ SD	5.98 $\pm$ 1.14	4.10 $\pm$ 1.00	MD = 1.88 (1.34 to 2.42)	Independent t-test (Welch)	<0.001*
Hospital stay (days), Mean $\pm$ SD	6.70 $\pm$ 1.52	4.81 $\pm$ 1.53	MD = 1.89 (1.13 to 2.65)	Independent t-test (Welch)	<0.001*
Hematoma, n (%)	3 (9.4)	1 (3.1)	OR = 2.49 (0.34 to 18.00)	Fisher's exact	0.613
Seroma, n (%)	6 (18.8)	1 (3.1)	OR = 5.15 (0.81 to 32.73)	Fisher's exact	0.104
Surgical site infection, n (%)	5 (15.6)	1 (3.1)	OR = 4.20 (0.64 to 27.43)	Fisher's exact	0.196

*Statistically significant at $p < 0.05$.

Table 3 highlights postoperative outcomes following both mesh repair techniques. Pain scores were significantly higher in the onlay group across all postoperative time points. On postoperative day 1, the mean VAS score was 7.91 ± 1.32 in the onlay group versus 5.15 ± 0.99 in the preperitoneal group ($p < 0.001$). Similar statistically significant differences were observed on day 3 (5.32 ± 1.01 vs 3.19 ± 0.78) and at discharge (3.77 ± 0.91 vs $1.09 \pm$

0.54) (all $p < 0.001$). Drain duration and hospital stay were also significantly longer in the onlay group, with mean drain duration 5.98 ± 1.14 days vs 4.10 ± 1.00 days and hospital stay 6.70 ± 1.52 days vs 4.81 ± 1.53 days (both $p < 0.001$). Although hematoma, seroma, and surgical site infection were more frequent in the onlay group (9.4%, 18.8%, and 15.6%, respectively) compared with the preperitoneal group (3.1%, 3.1%, and 3.1%), these differences did not reach statistical significance.

Table 4: Recurrence and Overall Effectiveness

Variable	Onlay (Group A) n=32	Preperitoneal (Group B) n=32	Effect size (95% CI)	Test of significance	p-value
Recurrence at 6 months, n (%)	2 (6.3)	0 (0.0)	OR = 5.33 (0.25 to 115.50)	Fisher's exact	0.492
Any postoperative complication (composite*) n (%)	12 (37.5)	3 (9.4)	OR = 5.80 (1.45 to 23.23)	Chi-square / Fisher	0.016*
No recurrence (effectiveness proxy), n (%)	30 (93.8)	32 (100.0)	OR = 0.31 (0.01 to 6.58)	Fisher's exact	0.492

Table 4 evaluates recurrence and overall effectiveness of both techniques. Recurrence at six months was observed in 6.3% of patients in the onlay group, whereas no recurrence was noted in the preperitoneal group; however, this difference was not statistically significant ($p = 0.492$). The composite postoperative complication rate was significantly higher in the onlay group (37.5%) compared with the preperitoneal group (9.4%) (OR 5.80; $p = 0.016$). The proportion of patients without recurrence, used as a proxy for overall effectiveness, was 93.8% in the onlay group and 100% in the preperitoneal group, showing no statistically significant difference ($p = 0.492$).

DISCUSSION

Baseline Characteristics (Table 1): In the present study, both groups were comparable in terms of baseline demographic and clinical characteristics. The mean age of patients in the onlay group (52.4 ± 11.8 years) and preperitoneal group (51.7 ± 12.1 years) showed no statistically significant difference ($p = 0.816$). Similar age comparability between onlay and preperitoneal repair groups has been reported by Tao et al. (2021),^[5] confirming that age does not influence selection of mesh placement technique when randomization is appropriately performed.

Male predominance observed in both groups in the present study is consistent with the findings of Kenawadkar et al. (2025),^[6] who reported slightly higher male incidence in ventral and umbilical hernia repairs. Furthermore, BMI distribution and obesity prevalence were comparable between groups, similar to observations by Munjuluri et al. (2025),^[7] emphasizing that obesity is a common risk factor but does not necessarily influence comparative outcomes between mesh planes.

The prevalence of comorbidities such as diabetes mellitus and hypertension was also similar between groups, which aligns with findings of Ghosh et al. (2024),^[2] who reported no baseline difference in systemic comorbidities between mesh repair techniques. Likewise, hernia defect size was comparable between groups in the present study, consistent with Fonseca et al. (2023),^[1] indicating adequate randomization and elimination of confounding factors.

Operative Efficiency and Intraoperative Events (Table 2): The present study demonstrated a significantly shorter operative duration for onlay mesh repair compared with preperitoneal repair (48.9 ± 3.1 min vs 72.1 ± 4.7 min; $p < 0.001$). This finding is consistent with Aiolfi et al. (2020),^[8] who reported shorter operative time with superficial mesh placement due to easier dissection and avoidance of deeper anatomical plane development.

Estimated blood loss was comparable between groups, similar to findings by Fonseca et al. (2023),^[1] suggesting that both techniques are equally safe intraoperatively. The incidence of excessive bleeding was low and statistically insignificant, which corroborates results of Ding et al. (2025).^[4] Importantly, no visceral injury occurred in either group, supporting observations by Tao et al. (2021),^[5] that both mesh placement techniques are safe when performed by experienced surgeons.

Postoperative Outcomes (Table 3): Postoperative pain scores were significantly lower in the preperitoneal group across all time points in the present study. This finding agrees with Kumar et al. (2023),^[9] who reported reduced postoperative pain with sublay/preperitoneal mesh placement due to less extensive subcutaneous dissection and improved mesh stabilization.

Drain duration and hospital stay were also significantly shorter in the preperitoneal group, which is consistent with findings of Santosa et al. (2025),^[10] who attributed faster recovery to reduced dead space formation and improved tissue integration in the preperitoneal plane.

Although postoperative complications such as hematoma, seroma, and surgical site infection were more frequent in the onlay group, the differences were not statistically significant. Similar trends have been reported by Fredberg et al. (2025),^[11] who observed higher seroma and wound complication rates with onlay repair due to extensive flap creation.

Recurrence and Overall Effectiveness (Table 4): Recurrence was observed only in the onlay group (6.3%), although the difference was not statistically significant due to limited sample size. This trend is consistent with results of Tryliskyy et al. (2023),^[12] who reported lower recurrence rates with preperitoneal mesh placement owing to better mesh reinforcement and distribution of intra-abdominal pressure.

The composite complication rate was significantly higher in the onlay group, aligning with findings of Chelala et al. (2025),^[13] and Tigora et al. (2025),^[14] which demonstrated reduced overall morbidity with sublay or extraperitoneal mesh placement.

CONCLUSION

The present study compared operative efficiency and postoperative complication profile of onlay mesh repair and preperitoneal mesh repair in adult umbilical hernia. Both techniques were found to be safe and effective methods of hernia repair with comparable baseline characteristics and low intraoperative complication rates.

Onlay mesh repair demonstrated a significantly shorter operative duration, making it technically simpler and time-efficient. However, preperitoneal mesh repair showed clear advantages in postoperative recovery, including significantly lower pain scores, reduced drain duration, shorter

hospital stay, and a lower incidence of wound-related complications such as seroma, hematoma, and surgical site infection.

Although recurrence was observed only in the onlay group, the difference was not statistically significant due to limited sample size and short follow-up. Nevertheless, the overall complication burden was significantly higher with onlay repair, while preperitoneal repair provided improved patient comfort and faster functional recovery.

Therefore, despite requiring longer operative time and greater technical expertise, preperitoneal mesh repair appears to be a superior technique in terms of postoperative outcomes and overall complication profile. Onlay repair remains a reasonable alternative in settings where operative time, surgical expertise, or anatomical constraints limit the feasibility of deeper mesh placement. Larger studies with longer follow-up are recommended to further evaluate recurrence and long-term outcomes.

Limitations of Study

- The comparative analysis included a relatively small randomized sample size, which may limit generalizability.
- Short follow-up duration may underestimate long-term recurrence and chronic pain outcomes.
- The study was conducted at a single tertiary care center, which may introduce institutional bias.
- Surgeon experience and technical variability could influence operative time and complication rates.
- Objective assessment of postoperative pain may be influenced by subjective patient perception.
- Lack of cost analysis limits assessment of economic feasibility between techniques.
- Radiological confirmation of recurrence was not routinely performed in asymptomatic patients.
- Influence of lifestyle factors such as occupation, smoking, and physical activity was not extensively analyzed.

REFERENCES

1. Fonseca MK, Tarso L, Gus J, Cavazzola LT. Short-term complications after onlay versus preperitoneal mesh repair of umbilical hernias: a prospective randomized double-blind trial. *Langenbeck's Archives of Surgery*. 2023 Jan 20;408(1):48.
2. Ghosh D, Naniwadekar RG. Clinical Analysis and Management of Umbilical and Paraumbilical Hernias in Adults: A Comparative Study of Surgical Techniques and Outcomes. *Frontiers in Health Informatics*. 2024 Apr 1;13(3).
3. Bergström M, Widhe B, Granåsen G, Löf Granström A, Ohlsson J, Schult S, Dahlstrand U, Österberg J, Loogna P, Bringman S, Melkemichel M. Onlay mesh versus suture repair for smaller umbilical hernias in adults—early results from SUMMER trial: randomized clinical trial. *BJS open*. 2025 Feb;9(1):zrae173.
4. Ding Y, Zhang Y, Zhang H, Liang B, Li R, Li J. Comparing the Efficacy of Laparoscopic and Open Umbilical or Paraumbilical Hernia Repair: An Updated Systematic

- Review and Meta-Analysis. *The American Surgeon™*. 2025 Dec 30;00031348251413521.
5. Tao Z, Ordonez J, Huerta S. Hernia size and mesh placement in primary umbilical hernia repair. *The American Surgeon*. 2021 Jun;87(6):1005-13.
 6. Kenawadekar R, Yadav GN, Nayak RM. A comparative study of efficacy of laparoscopic transabdominal preperitoneal-plus versus intraperitoneal onlay mesh-plus repair for small umbilical hernias. *Journal of Minimal Access Surgery*. 2025 Dec 5:10-4103.
 7. Munjuluri K, Raghunath AJ, Alexander N. Comparative Study Between Laparoscopic Transabdominal Preperitoneal Repair Plus and Laparoscopic Intraperitoneal Onlay Repair Plus of Umbilical and Paraumbilical Hernia. *Journal of Abdominal Wall Surgery*. 2025 Jun 3;4:14663.
 8. Aiolfi A, Cavalli M, Micheletto G, Bruni PG, Lombardo F, Morlacchi A, Bonitta G, Campanelli G, Bona D. Open mesh vs. suture umbilical hernia repair: systematic review and updated trial sequential meta-analysis of randomized controlled trials. *Hernia*. 2020 Aug;24(4):707-15.
 9. Kumar J, Gopinathan A, Ramalingam S, Ramachandran B. Subcutaneous Onlay Laparoscopic Approach versus Laparoscopic Intraperitoneal Onlay Mesh Repair for Paraumbilical Hernias: A Randomised Clinical Trial. *Journal of Clinical & Diagnostic Research*. 2023 May 1;17(5).
 10. Santosa IW, Azizah I. Surgical Treatment and Management of the Hernia Umbilical Riview and Update. *Journal La Medihealtico*. 2025 Dec 31;6(5):1498-508.
 11. Fredberg J, Oma E, Helgstrand F, Qvist N, Friis-Andersen H, Jørgensen LN. Emergency umbilical and epigastric hernia repair: nationwide registry-based study of long-term recurrence, mesh-related, and other complications. *Surgical endoscopy*. 2025 Jul;39(7):4253-65.
 12. Trylisky Y, Tyselskyi V, Kebkalo A, Ponomarov N. Systematic review and meta-analysis comparing ventral hernia repair using minimally-invasive extended totally extraperitoneal repair versus intraperitoneal onlay mesh repair. *Polish Journal of Surgery*. 2023;96(2):59-67.
 13. Chelala E, Jacob B. Laparoscopic “Intraperitoneal Underlay Mesh”-Plus: A Viable Approach for Incisional-Ventral Hernia Repair. *Journal of Abdominal Wall Surgery*. 2025 Jun 18;4:14459.
 14. Tigora A, Radu PA, Garofil DN, Bratucu MN, Zurzu M, Paic V, Ioan RG, Surlin V, Margaritescu D, Badoiu SC, Popa F. Modern perspectives on inguinal hernia repair: a narrative review on surgical techniques, mesh selection and fixation strategies. *Journal of Clinical Medicine*. 2025 Jul 9;14(14):4875.