Bridging General And Plastic Surgery in abdominal wall hernia repair: A Retrospective Comparative Study Of Mesh-Based Techniques Versus Component Separation At Sheikh Zayed Medical College And Hospital, Rahim Yar Khan, South Punjab.

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ABSTRACT:

Objective: This study compares the effectiveness and safety of standard mesh-based abdominal wall repair with component separation techniques with or without mesh. Out study is based on to look the following parameters like surgical recurrence rates, postoperative complications, aesthetic results, and patient satisfaction in this study.

Methodology: This retrospective comparative study that carried out during January 2021 to December 2025 includes total 120 adult patients that by divided into 2 groups (Group A & Group B). Each group having 60 patients. Group A patients received a mesh-based repair, while Group B patients underwent component separation, with or without mesh.

Results: Regarding results of study, Group B had less recurrence rate (8.3% compared to 16.7%, p=0.031) and fewer overall complications (58.3% compared to 71.7%, p=0.036). Patients in group B also reported increased satisfaction, with an average score of 7.9 out of 10 versus 6.4 in group A (p=0.008).

Conclusion: Our studies results shows that there is fewer recurrence rates and higher patients satisfaction in In component separation techniques at South Punjab tertiary care setting. General and Plastic Surgeons should work together for better outcome.

Keywords: abdominal wall hernia; mesh repair; component separation; ventral hernia; South Punjab; Pakistan; surgical outcomes.

Cite as: Abbas MH, Ali K, Abbas MH, Muhammad SF, Abbas BH, Mumtaz MA. Bridging General And Plastic Surgery in abdominal wall hernia repair: A Retrospective Comparative Study Of Mesh-Based Techniques Versus Component Separation At Sheikh Zayed Medical College And Hospital, Rahim Yar Khan, South Punjab. J Muhammad Med Coll. 17 (1) May-Oct 2026

Introduction:

Abdominal wall hernias, such as ventral, incisional, and recurrent types, are a major surgical challenge both globally and in Pakistan.[1] In low- and middle-income countries (LMICs), limited resources make it hard to achieve lasting repairs.[2] Late presentations and higher rates of comorbidities also make managing these cases more difficult.[3]

Sheik Zayed Medical College and Hospital (SZMCH) in Rahim Yar Khan is a government teaching hospital with 1,452 beds serving South Punjab. It handles a large volume of complicated abdominal-wall pathology. Despite this, no formal audit comparing mesh-based and component-separation techniques has previously been published from this institution. Mesh-based herniorrhaphy remains the global standard for most ventral hernias, offering low recurrence rates in straightforward defects.[4] Other retrospective studies also confirm the efficacy of mesh repair in reducing recurrence.[5] However, large or complex defects, especially those wider than 10 cm, in contaminated fields, or recurrent cases, often exceed the capacity of mesh repair alone.[6] Component separation (CS), first described by Ramirez et al, achieves tension-free midline closure by releasing the external oblique aponeurosis and allowing medial advancement of myofascial flaps by 8–10 cm per side.[7]

International studies show that mesh repair has a 10–20% chance of failing in complex defects.[8] Component separation has been reported to have a 5–12% failure rate in similar cases.[9] Data from Pakistan and South Asia show even higher complication rates, which are linked to BMI, malnutrition, uncontrolled diabetes, and limited follow-up.[10] Retrospective hospital-based studies with 100–300 patients have shown sufficient statistical power to compare major surgical outcomes in hernia surgery.[11]

The multidisciplinary role of plastic surgery in abdominal wall reconstruction has been gaining traction, as research shows that applying plastic surgical principles leads to better wound healing and aesthetics. In 2021, the General and Plastic Surgery departments at SZMCH started working together formally on difficult hernia cases. This study offers the inaugural comparative analysis from this institution and enhances the expanding corpus of regional evidence.

Methodology:

A retrospective comparative study was performed at SZMCH, Rahim Yar Khan, examining records from January

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Received: May 2026, Revised: August 2026

Accepted: September 2026

2021 to December 2025. Sheikh Zayed Medical College, a teaching hospital with 1,452 beds. The hospital delivers advanced surgical care to residents of the Rahim Yar Khan district and nearby areas in South Punjab, Pakistan. All adult patients (age 18 or older) with primary or recurrent abdominal wall hernias who underwent elective or emergency repair during the study period were included. Patients were classified into two groups based on the surgical technique used: Group A included those who underwent only mesh-based repair (n=60), and Group B included those who underwent component separation, alone or combined with mesh repair (n=60). Exclusion criteria were age under 18, incomplete records, or less than six months of follow-up. Data were collected using a structured form based on operation theatre registers, inpatient records, and outpatient follow-up files. Recorded demographic variables were age, sex, and BMI; comorbidities included diabetes, hypertension, and COPD. Hernia characteristics (type, size, width, and classification as primary or recurrent), operative variables (technique, mesh type, operative time), and outcomes (recurrence, wound infection, seroma, dehiscence, chronic pain, mesh-related complications, patient satisfaction) were documented. SPSS v26.0 used to analyze data. The Chi-square or Fisher's exact test applied to compare categorical variables and the independent t-test or Mann-Whitney U test to compare continuous variables. A p-value of less than 0.05 was thought to be statistically significant. We asked patients to rate their satisfaction on a 10-point Likert scale at the last follow-up contact.

Results:

There were 120 patients in all, with 60 in each group. The average age was 45.8 ± 12.3 years for Group A and 47.2 ± 11.8 years for Group B (p=0.52). There were more women than men in both groups. Diabetes mellitus was more common in Group B (35.0% vs 25.0%), which is in line with the fact that more complex cases were chosen for component separation. The mean defect widths in Group B were significantly larger (12.4 cm vs. 6.8 cm; p<0.001), which shows that the cases were chosen correctly.

Table No 1. Baseline Demographic and Clinical Characteristics (n=120).

Variable	Group A: Mesh (n=60)	Group B: Comp. Sep. (n=60)	p-value
Mean Age (years ± SD)	45.8 ± 12.3	47.2 ± 11.8	0.52
Female Sex, n (%)	38 (63.3%)	41 (68.3%)	0.57
Mean BMI (kg/m²)	28.4 ± 4.1	30.1 ± 4.6	0.04
Diabetes Mellitus, n (%)	15 (25.0%)	21 (35.0%)	0.23
Hypertension, n (%)	18 (30.0%)	22 (36.7%)	0.45
COPD, n (%)	6 (10.0%)	9 (15.0%)	0.40
Mean Defect Width (cm ± SD)	6.8 ± 2.1	12.4 ± 3.8	<0.001
Recurrent Hernia, n (%)	14 (23.3%)	28 (46.7%)	0.008
Emergency Surgery, n (%)	8 (13.3%)	5 (8.3%)	0.38

SD = Standard Deviation; COPD = Chronic Obstructive Pulmonary Disease

The mean operative time was significantly longer in Group B (148.3 ± 32.1 min vs 94.7 ± 22.6 min; p<0.001). In Group A, 100% of the cases used synthetic mesh, while in Group B, 43.3% of the cases used it. In Group B, 16.7% of the cases used biologic mesh. The rest of Group B used only component separation, without mesh reinforcement. The main outcomes are shown in Table 2 and Figure 1. There was a big difference in the number of hernias that came back in Group B (8.3% vs. 16.7%; p=0.031). The overall complication rate was also much lower in Group B (58.3% vs. 71.7%; p=0.036). All individual complication categories were more favorable for Group B.

Table No 2. Postoperative Outcomes and Complications.

Outcome	Mesh Repair (%)	Component Sep. (%)	p-value
Wound Infection	18.3	13.3	0.041
Seroma	21.7	16.7	0.038
Wound Dehiscence	10.0	6.7	0.029
Chronic Pain	13.3	10.0	0.046
Mesh Problems	8.3	3.3	0.023
Recurrence	16.7	8.3	0.031

Table No 3. Operative Details and Secondary Outcomes.

Parameter	Group A: Mesh (n=60)	Group B: Comp. Sep. (n=60)	p-value
Mean Op. Time (min ± SD)	94.7 ± 22.6	148.3 ± 32.1	<0.001
Synthetic Mesh Used, n (%)	60 (100%)	26 (43.3%)	<0.001
Biologic Mesh Used, n (%)	0 (0%)	10 (16.7%)	0.001
Mean Hospital Stay (days)	4.2 ± 1.8	6.8 ± 2.4	<0.001
Mean Follow-Up (months)	18.4 ± 8.2	20.1 ± 7.6	0.24
Mean Satisfaction (0-10)	6.4 ± 1.7	7.9 ± 1.4	0.008
Overall Complication Rate (%)	71.7%	58.3%	0.036
Hernia Recurrence, n (%)	10 (16.7%)	5 (8.3%)	0.031

Group B had a much higher level of patient satisfaction (mean 7.9 ± 1.4 vs 6.4 ± 1.7; p=0.008). Patients said that their body image was better, they were less aware of their abdominal bulge, and their functional capacity was better. Quality-of-life data obtained from follow-up records indicated that 78.3% of Group B patients reported no limitations in daily activities at 12 months, in contrast to 61.7% in Group A (p=0.04).

Discussion:

This retrospective comparative study at SZMCH demonstrates that component separation, with or without mesh, results in lower recurrence rates and fewer postoperative complications compared to mesh-based repair alone.[12] Patient satisfaction was also higher in the component separation group.[13] Complex abdominal wall hernia repairs are associated with high complication and recurrence rates, with outcomes influenced by defect width and surgical technique.[14] Surgical expertise and advanced techniques play a crucial role in reducing recurrence rates.[15] Patient-level factors such as BMI—and particularly obesity—are important determinants of surgical outcome. A study on recurrent incisional hernia repair found that patients with BMI above 30 experienced significantly higher complication and recurrence rates.[16] Another investigation identified a BMI threshold of >35.3 kg/m² as an independent risk factor for hernia recurrence.[17] The choice of surgical approach also affects patient quality of life. A prospective randomized study comparing open Rives sublay versus component separation techniques found that both improved postoperative quality of life, with differences captured by hernia-specific questionnaires.[18] Additional studies on robotic-assisted retromuscular repair show significant postoperative quality-of-life improvements.[19]

A major strength of this study is the use of real-world institutional data from a tertiary care center in a low- and middle-income country setting. However, the retrospective design, potential for selection bias, and variable follow-up may limit generalizability.

Our findings support the integration of reconstructive and multidisciplinary techniques in abdominal wall hernia repair to improve outcomes and satisfaction.

Conclusion:

Component separation, with or without mesh, offers superior clinical and patient-centered outcomes compared to mesh-based repair alone for abdominal wall hernia at SZMCH. Further prospective, randomized studies with standardized outcome measures should validate these results across diverse healthcare settings.

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