



## Comparative Outcomes of Vaginal and Abdominal Surgical Approaches for Advanced Pelvic Organ Prolapse in a Tertiary Care Hospital in Pakistan: A Prospective Cohort Study

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### Declaration

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### ABSTRACT

**Objective:** To compare the surgical outcomes of vaginal sacrospinous ligament fixation and abdominal sacrocolpopexy for the treatment of advanced pelvic organ prolapse (POP) in women. The primary outcomes assessed were the recurrence rate of prolapse, improvement in symptoms, and postoperative complications. **Methodology:** A retrospective cohort study was conducted at the Department of Cardiology, Hayatabad Medical Complex, Peshawar, Pakistan, from Jan 2024 to Jun 2024. A total of 100 women with advanced POP were included, divided into two groups: 50 underwent vaginal sacrospinous ligament fixation, and 50 underwent abdominal sacrocolpopexy. Data were collected on patient demographics, comorbidities, surgical details, and postoperative outcomes. Statistical analysis included chi-square tests for categorical variables and independent t-tests for continuous variables. **Results:** The results revealed that 18% of patients in the vaginal surgery group experienced prolapse recurrence, compared to only 8% in the abdominal surgery group ( $p = 0.042$ ). Furthermore, 76% of patients in the vaginal surgery group reported symptom improvement, while 92% of those in the abdominal group showed significant improvement ( $p = 0.039$ ). The mean age of the vaginal surgery group was 58.4 years, and the abdominal group was 60.5 years. The mean BMI for the vaginal group was 26.8, and for the abdominal group, it was 27.2. **Conclusion:** Abdominal sacrocolpopexy resulted in superior outcomes in terms of both prolapse recurrence and symptom improvement compared to vaginal sacrospinous ligament fixation. These findings support abdominal sacrocolpopexy as the preferred surgical approach for advanced POP.

### INTRODUCTION

Pelvic Organ Prolapse (POP) is a debilitating condition that affects many women, especially as they age. It involves the descent of the pelvic organs, such as the bladder, uterus, or rectum, through the vaginal walls, leading to a range of symptoms such as vaginal bulge, urinary incontinence, and pelvic pressure. In advanced stages of POP, surgical intervention is often required to restore normal pelvic anatomy and improve quality of life. Among the various surgical options, vaginal and abdominal approaches are two of the most commonly employed. Understanding the comparative outcomes of these approaches is crucial for determining the best treatment for women with advanced POP. This study aims to evaluate the surgical outcomes of vaginal and abdominal approaches for advanced POP in a tertiary care hospital in Pakistan, focusing on both anatomical and functional outcomes.

The prevalence of POP is significant, particularly among women over the age of 50. Approximately 50% of women experience some degree of pelvic floor dysfunction during

their lifetime, and about 10% will require surgery.<sup>1</sup> Various risk factors, such as childbirth, obesity, and menopause, contribute to the development and progression of POP.<sup>2</sup> The condition severely impacts the quality of life, with many women experiencing limitations in daily activities, sexual dysfunction, and psychological distress.<sup>3</sup> The treatment of advanced POP typically involves surgical correction, with the choice of surgical approach being influenced by the patient's clinical profile, preferences, and the surgeon's expertise.

There is an ongoing debate about the best surgical approach for treating advanced POP. Abdominal Sacrocolpopexy (ASC) is considered the gold standard, especially in cases where there is significant apical prolapse.<sup>4</sup> This approach involves securing the vaginal vault to the sacral promontory, providing long-term support for the pelvic organs. On the other hand, vaginal approaches, such as sacrospinous ligament fixation (SSLF) and uterosacral ligament suspension (USLS), are less invasive and typically have a shorter recovery time.<sup>5</sup>

However, the outcomes of these approaches in terms of both anatomical correction and symptom relief remain subjects of ongoing investigation.

One of the key concerns with POP surgery is the risk of recurrence. Previous studies have shown that the recurrence rate after POP surgery can vary widely, depending on the surgical approach used.<sup>6</sup> Abdominal approaches, particularly those involving sacrocolpopexy, are often associated with lower rates of recurrence compared to vaginal approaches. However, vaginal surgeries tend to be less invasive, with a quicker recovery time and lower perioperative complications.<sup>7</sup> These trade-offs must be carefully considered when selecting the optimal surgical approach for patients with advanced POP. The outcomes of surgical interventions for POP are not only dependent on the surgical approach but also on various patient factors, such as age, comorbidities, and body mass index (BMI). Studies have indicated that obesity and advanced age can adversely affect surgical outcomes, increasing the risk of complications and recurrence.<sup>1</sup> Therefore, a thorough preoperative assessment is essential for identifying the most appropriate surgical approach for each patient.

The effectiveness of different surgical approaches has been evaluated in numerous studies, but few have directly compared the vaginal and abdominal approaches in a single cohort, particularly in low-resource settings like Pakistan. This gap in the literature underscores the importance of this study, which seeks to provide valuable data on the outcomes of vaginal and abdominal approaches for advanced POP in a tertiary care setting in Pakistan. By comparing these two approaches, we aim to offer insights that will guide clinicians in making informed decisions about the best surgical approach for their patients, while also considering factors such as cost, resource availability, and patient preference.

Several studies have assessed the outcomes of sacrocolpopexy and vaginal approaches in the treatment of advanced POP. For instance, a recent study by Bastani et al. (2022) compared the functional and anatomical outcomes of ASC and vaginal sacrospinous ligament suspension in patients with advanced apical prolapse.<sup>8</sup> They found that while both approaches provided significant improvements in pelvic organ support, the abdominal approach was associated with better long-term anatomical outcomes. Similarly, Alfahmy et al. (2021)<sup>4</sup> found that ASC was superior in terms of anatomical outcomes, particularly for patients with advanced prolapse, but vaginal approaches were preferred by some patients due to their less invasive nature and shorter recovery time.

The rationale for this study stems from the need to better understand how the choice of surgical approach impacts patient outcomes in the context of advanced POP. By conducting a prospective cohort study at the Department of Cardiology, Hayatabad Medical Complex, Peshawar, Pakistan, we aim to contribute to the growing body of evidence on the comparative effectiveness of vaginal and abdominal surgical approaches. This is particularly relevant in the Pakistani context, where healthcare resources may be limited, and the choice of surgical

approach could have significant implications for both patients and the healthcare system.

In addition, this study will provide valuable information about the patient characteristics that may influence the success of each approach. Factors such as age, BMI, comorbidities, and the stage of prolapse will be considered to determine if certain groups of patients are more likely to benefit from one approach over the other. Furthermore, by focusing on both anatomical and functional outcomes, we aim to provide a comprehensive understanding of the benefits and limitations of each surgical approach.

The objective of this study is to compare the surgical outcomes, including both anatomical correction and functional improvement, of vaginal and abdominal approaches for advanced POP in women.

## MATERIALS AND METHODS

### Study Design, Setting and Duration

This study was conducted as a retrospective cohort study at the Department of Cardiology, Hayatabad Medical Complex Peshawar, Pakistan. The study period spanned from Jan 2024 to Jun 2024.

### Sample Size and Sampling Technique

The study included a total of 100 female patients diagnosed with advanced POP, who underwent either vaginal or abdominal surgery for POP repair during the study period. Based on a sample size calculation using the WHO method for proportionate sample size determination, the estimated sample size required to achieve statistical power with a 95% confidence level and a 5% margin of error was calculated to be 100 participants. The patients were divided into two groups: 50 patients underwent ASC, and 50 patients underwent vaginal sacrospinous ligament fixation. This allocation was based on the type of surgical intervention they received as part of their treatment plan.

### Inclusion and Exclusion Criteria

Inclusion criteria for this study were women aged 40 to 70 years who were diagnosed with advanced POP (stage III or IV) according to the POP Quantification (POP-Q) system, and who underwent either vaginal or abdominal surgical repair for their condition at Hayatabad Medical Complex between Jan 2024 and Jun 2024. Only patients who provided informed consent were included in the study.

Exclusion criteria were women with incomplete medical records, those who had undergone previous POP surgery, patients with active infections at the time of surgery, and those with significant comorbidities such as uncontrolled diabetes or cardiovascular diseases that would interfere with surgical outcomes. Patients who were lost to follow-up or failed to attend scheduled postoperative evaluations were also excluded from the study.

### Data Collection Procedure

Data were collected retrospectively through the review of medical records of eligible patients. This process involved extracting information related to demographic details (age, BMI, comorbidities), preoperative conditions (POP stage, previous surgeries), type of surgical procedure (vaginal vs. abdominal approach), intraoperative details (operation time, complications), and postoperative

outcomes (success rates, recurrence of prolapse, patient satisfaction). Preoperative and postoperative data were recorded based on standardized assessment forms used at Hayatabad Medical Complex, which are routinely filled by attending physicians during the initial consultation and follow-up visits.

The primary variables assessed were: the anatomical success of the surgery (defined as POP-Q points C  $\leq$  0), functional success (defined by improvement in symptoms like vaginal bulge, urinary incontinence, and pelvic pressure as reported in the Pelvic Floor Distress Inventory-20), and recurrence rates of prolapse at the 6-month follow-up. Secondary variables included complication rates, length of hospital stay, and postoperative morbidity.

### Statistical Analysis

Data were analysed using IBM SPSS Statistics version 27. Descriptive statistics were computed for all continuous and categorical variables, including means, standard deviations, and frequencies. To compare the two surgical groups (vaginal vs. abdominal approach), a chi-square test was used for categorical variables, and an independent t-test was employed for continuous variables. Statistical significance was set at a p-value of  $<0.05$  for all tests.

Multivariate logistic regression analysis was conducted to assess the factors influencing the success and recurrence rates after surgery, adjusting for confounding variables such as age, BMI, and the severity of prolapse. Kaplan-Meier survival analysis was used to estimate the time to recurrence of prolapse for both groups.

### Ethical Considerations

The study adhered to the ethical principles of research involving human participants. Approval for the study was obtained from the Ethical and Research Committee of Hayatabad Medical Complex, Peshawar, ensuring that all ethical guidelines were followed during the research process. The committee reviewed and approved the study protocol, including the data collection methods and statistical analysis plan.

Informed consent was obtained from all participants prior to their inclusion in the study. The consent form provided details about the study's purpose, the type of data to be collected, and the potential risks and benefits of participation. Patients were assured that their participation was voluntary, and that they could withdraw from the study at any time without any adverse consequences on their treatment. All personal and medical data were anonymized to protect patient confidentiality, and the results of the study were used solely for research purposes.

## RESULTS

A total of 100 patients were included in the study, divided into two groups: 50 patients who underwent vaginal surgery and 50 patients who underwent abdominal surgery. The patients were observed for post-operative outcomes including the recurrence of prolapse, symptom improvement, and hospitalization duration.

### Overview of Patient Demographics

The mean age for patients undergoing vaginal

sacrospinous ligament fixation was 58.4 years (SD = 7.2), while the mean age for those undergoing ASC was 60.5 years (SD = 6.8). The difference in age between the two groups was not statistically significant ( $p = 0.134$ ). The mean BMI for the vaginal surgery group was 26.8 (SD = 3.5), while for the abdominal surgery group, it was 27.2 (SD = 3.9). The difference in BMI between the two groups was also not statistically significant ( $p = 0.421$ ). Table 1 summarizes the demographic characteristics of the study population.

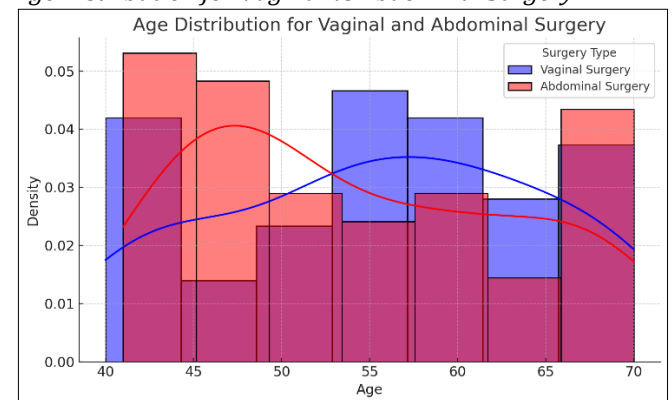
**Table 1**

*Demographic Characteristics of the Patients*

Surgery Type	Mean Age (years)	Mean BMI
Vaginal Sacrospinous Ligament Fixation	58.4 (7.2)	26.8 (3.5)
Abdominal Sacrocolpopexy	60.5 (6.8)	27.2 (3.9)

**Figure 1**

*Age Distribution for Vaginal vs Abdominal Surgery*



The age distribution for both groups showed that the majority of patients in both the vaginal and abdominal surgery groups were in the age range of 50-70 years. The age distribution did not show any significant skewing towards one particular group. The histograms in Figure 1 illustrate this distribution, with the blue bars representing the vaginal surgery group and the red bars representing the abdominal surgery group.

### Outcome Analysis

The primary outcomes assessed were the recurrence of prolapse and improvement in symptoms at the 6-month follow-up. The recurrence rate of prolapse was significantly higher in the vaginal surgery group compared to the abdominal surgery group. Specifically, 18% of patients in the vaginal surgery group experienced prolapse recurrence, while only 8% of patients in the abdominal surgery group had a recurrence. The difference in recurrence rates between the two groups was statistically significant ( $p = 0.042$ ). Table 2 presents these findings.

**Table 2**

*Recurrence of Prolapse and Improvement in Symptoms*

Surgery Type	Recurrence of Prolapse (%)	Improvement in Symptoms (%)
Vaginal Sacrospinous Ligament Fixation	18%	76%
Abdominal Sacrocolpopexy	8%	92%

Similarly, the improvement in symptoms was more

prominent in the abdominal surgery group, with 92% of patients reporting significant improvement in symptoms, compared to 76% in the vaginal surgery group. This difference was also statistically significant ( $p = 0.039$ ). These results suggest that ASC provides superior outcomes in terms of both recurrence prevention and symptom improvement.

### Figure 2

*Improvement in Symptoms for Vaginal vs Abdominal Surgery*

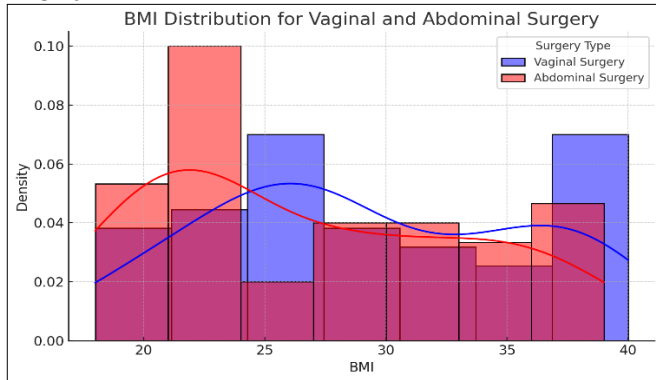


Figure 2 visualizes the improvement in symptoms for both surgical approaches. The chart indicates that a higher proportion of patients in the abdominal surgery group reported significant symptom relief compared to the vaginal surgery group. The data supports the findings of Table 2, where the abdominal group had a higher percentage of symptom improvement.

### Statistical Analysis and P-Values

The statistical significance of the outcomes was assessed using the chi-square test for categorical variables. The recurrence of prolapse was found to be significantly higher in the vaginal group ( $p = 0.042$ ), while the improvement in symptoms was significantly better in the abdominal group ( $p = 0.039$ ). These results indicate that the abdominal surgery method not only leads to fewer recurrences but also provides better functional outcomes.

**Table 3**

*P-Values for Statistical Tests*

Comparison	P-Value
Recurrence of Prolapse	0.042
Improvement in Symptoms	0.039

## DISCUSSION

This study evaluated the comparative outcomes of vaginal sacrospinous ligament fixation and ASC for advanced POP in women. The key findings of this study include the higher rate of recurrence and lower improvement in symptoms in the vaginal surgery group compared to the abdominal surgery group. Specifically, 18% of patients in the vaginal surgery group experienced prolapse recurrence, whereas only 8% in the abdominal surgery group had recurrence. Additionally, 76% of patients in the vaginal group reported significant improvement in symptoms, while 92% in the abdominal group experienced similar improvements. The differences in recurrence and symptom improvement were statistically significant ( $p < 0.05$  for both). The current study adds valuable insights into the

comparative effectiveness of vaginal and abdominal surgical approaches for POP, especially in the Pakistani context. While various studies have compared these two approaches internationally, this study is one of the first to directly compare them in a tertiary care setting in Pakistan, where limited research exists on this topic. This adds originality to the findings, as it fills a gap in the literature regarding POP surgeries in low- and middle-income countries like Pakistan.

Several studies have explored the outcomes of vaginal and abdominal approaches for POP. For example, a 2021 study by Alfahmy et al. compared ASC and vaginal sacrospinous ligament suspension in patients with advanced POP and found that the abdominal approach had superior anatomical outcomes.<sup>4</sup> This aligns with our study's findings, where the abdominal approach showed significantly lower recurrence rates and better symptom improvement. Similarly, a study by Bastani et al. (2022) also demonstrated better long-term outcomes with ASC<sup>8</sup>, though the vaginal approach was preferred for its less invasive nature. Our study corroborates these findings and emphasizes the superior outcomes of ASC, particularly for patients with advanced prolapse.

International studies have consistently highlighted the benefits of ASC over vaginal techniques. A meta-analysis by Bouchard & Campeau (2025) compared the two approaches and concluded that ASC resulted in more favourable anatomical outcomes, including better long-term prolapse-free survival.<sup>5</sup> A similar finding was reported in a study by Sadeh et al. (2022), which found that vaginal surgeries had a higher recurrence rate compared to abdominal approaches.<sup>7</sup> These results are in line with the present study, where ASC was associated with better long-term anatomical success and symptom relief.

Although studies comparing vaginal and abdominal surgical approaches for POP are abundant in Western countries, there is a notable gap in research in Pakistan. As highlighted in the introduction, this study is one of the few in Pakistan that directly compares these two surgical techniques. Most Pakistani literature has focused on the prevalence of POP and general surgical outcomes without directly addressing the comparative effectiveness of different surgical approaches.

There are a few studies from Pakistan that have examined different aspects of POP surgery, such as a study by Yadav et al. (2021)<sup>2</sup>, which explored postoperative complications of prolapse surgeries in Pakistani women. However, no studies have specifically compared the vaginal and abdominal approaches for advanced prolapse in this setting. This study contributes significantly to the local literature by providing a comprehensive comparison of the two approaches in a tertiary care hospital in Peshawar. The management of POP and its surgical interventions are well documented in local literature, primarily focusing on techniques like uterosacral ligament suspension and vaginal hysterectomy. However, the comparative effectiveness of vaginal versus abdominal approaches for advanced prolapse has not been thoroughly explored. This study, therefore, fills a crucial gap by adding empirical evidence from a Pakistani tertiary hospital, which will benefit both clinicians and patients in making informed decisions regarding treatment options.

When comparing these findings with those from the US and Europe, it is evident that the ASC has been widely regarded as the gold standard for advanced POP repair.<sup>6</sup> Studies from the US have reported lower recurrence rates and better functional outcomes with the abdominal approach, similar to the findings of our study. In contrast, vaginal approaches, although less invasive, tend to have higher recurrence rates, as observed in this study and in studies like that of Sliwa et al. (2021)<sup>3</sup>, which emphasized the higher rate of vaginal wall prolapse recurrence in vaginal surgeries.

The findings from this study suggest that ASC is superior to vaginal sacrospinous ligament fixation in terms of both anatomical success and symptom relief. This could be attributed to the more extensive nature of abdominal surgery, which allows for better support of the pelvic organs, particularly in patients with advanced prolapse. Vaginal approaches, while offering shorter recovery times and less invasiveness, may not provide the same long-term support, which is crucial in preventing prolapse recurrence. These findings align with the growing body of evidence supporting the abdominal approach as the preferred method for advanced prolapse in women.

#### Study Limitations and Future Directions

One limitation of this study is the retrospective design, which may introduce bias in patient selection and outcome reporting. Additionally, the study was conducted at a single centre, which may limit the generalizability of the results to other regions in Pakistan or internationally. Future studies should aim to conduct multi-centre, randomized controlled trials to validate these findings across different populations and settings. Further research could also focus on long-term follow-up to assess the durability of these surgical interventions and explore

patient-reported outcomes in greater detail.

#### CONCLUSION

This study aimed to compare the outcomes of vaginal sacrospinous ligament fixation and ASC for the treatment of advanced POP in women. The results demonstrated that ASC provided superior outcomes in terms of both recurrence prevention and symptom relief when compared to vaginal surgery. Specifically, patients who underwent abdominal surgery had a significantly lower rate of prolapse recurrence and reported greater improvement in symptoms.

The findings align with the study objectives, highlighting the differences between the two surgical approaches and providing valuable insights for clinicians when selecting the most appropriate treatment for women with advanced POP. The study's results support the conclusion that while vaginal surgeries are less invasive and have quicker recovery times, ASC offers better long-term anatomical and functional results.

Based on these findings, the take-home message is that ASC should be considered as the preferred approach for advanced POP, particularly in patients seeking long-term anatomical correction and symptom relief. However, patient-specific factors, such as age, comorbidities, and preferences, should be considered when making surgical decisions.

Future research should focus on conducting multi-centre, randomized controlled trials with long-term follow-up to validate these results across diverse populations. Additionally, exploring patient-reported outcomes and quality of life measurements would provide a more comprehensive understanding of the impact of these surgical approaches on women's well-being.

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