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# Outcomes of Concurrent Surgery for Prolapse Repair and Stress Urinary Incontinence: A Pilot Observational Study

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## ABSTRACT

***Objective:*** To compare the effectiveness of combined surgery versus isolated prolapse surgery in alleviating urinary leakage symptoms.

***Study Design:*** Quasi-experimental study.

***Place and Duration of Study:*** Urogynecology unit of Shalamar Hospital, Lahore, Pakistan, from Sep 2024 to May 2025.

***Methodology:*** A total of 17 participants presenting with overt urinary leakage along with prolapse of pelvic viscera, scheduled for surgery, were included in the study. The primary outcome was the resolution of stress urinary incontinence (SUI). Negative cough stress test conducted at six months was considered an objective cure. Mean±SD was used for continuous variables, while categorical variables were presented as frequencies and percentages. Statistical significance was considered at a *p*-value of less than 0.05.

***Results:*** Out of the 17 patients, 9(52%) underwent exclusive prolapse repair, while 8(47%) received both prolapse repair and anti-incontinence surgery. At six months, women in the combined surgery group were more likely to report the absence of stress urinary incontinence (SUI) compared to those in the prolapse surgery-only group, with 75% versus 33%, respectively. Additionally, two women (25%) in the combined group required further treatment for SUI (all physiotherapy), compared to six women (66%) in the control group, who also received physiotherapy.

***Conclusions:*** Women are less prone to have incontinence after combined surgery compared with isolated POP surgery and are less likely to undergo additional treatment for SUI.

**Keywords:** Stress Urinary Incontinence, Pelvic Organ Prolapse, Concomitant Surgery, Cough Stress Test.

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## INTRODUCTION

Urinary incontinence (UI) is a distressing medical problem affecting 26% of females in developing countries, with stress incontinence being the most prevalent type (12.6%).[1] The prevalence of pelvic organ prolapse (POP) in Pakistan is 10.3%, and almost 12.5% patients suffer from both prolapse and urinary incontinence.[2,3] The surgical methods used for SUI include Burch Colposuspension (BC), mid-urethral tapes, and pubo-urethral ligament plication.[4,5] For prolapse the route of repair can be abdominal or vaginal and surgical methods include repair of anterior and posterior compartment descend, reconstructive procedures to preserve uterus or vaginal hysterectomy.[6]

Women with prolapse and coexisting SUI are more prone (40%) to undergo surgery for bothersome incontinence later on, while combined surgery reduces this risk, providing symptomatic relief.[7,8] On the other hand, stress urinary incontinence spontaneously improves in almost one third of patients after prolapse surgery alone, without the need for additional anti-incontinence intervention.[9,10] Overall, there is inadequate evidence to determine whether concomitant vaginal POP repair and anti-incontinence surgery is effective in reducing postoperative SUI. Therefore, our objective is to compare the outcomes of patients undergoing combined surgery for prolapse and stress incontinence with those undergoing surgery for pelvic organ prolapse alone.

## METHODOLOGY

Quasi-experimental research was conducted in Urogynecology unit of Shalamar Hospital, Lahore, Pakistan, from Sep 2024 to May 2025. Seventeen female patients aged 41-83 years presenting with pelvic organ prolapse and stress urinary incontinence already scheduled for surgical intervention were recruited after obtaining ethical approval from ethic committee of Shalamar Medical and Dental College (IRB No.0693 approved on 04/9/24). Sample size was calculated using the WHO sample size calculator, taking a confidence interval of 95%, a margin of error

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of 5%, and an estimated prevalence of prolapse and urinary incontinence of 12.5% in women in Pakistan. Using the formula: $N = Z^2 \times P(1-P) / E^2$, where Z = 1.96 (for 95% confidence), $p$=0.125, and E = 0.05, the estimated sample size came out to be 16.36, which was rounded up to the nearest whole number. Thus, the final sample size for our study was 17 patients.

**Inclusion Criteria:** Patients with stress urinary incontinence and pelvic organ prolapse, willing to undergo surgery, and who agreed to participate in the research project.

**Exclusion Criteria:** Patients having urge incontinence, urinary tract infection, unwilling or unfit for operation, recent prolapse or previous incontinence surgery, urogenital malignancy, and urolithiasis.

All participants had prolapsed 1cm below hymenal ring according to Pelvic Organ Prolapse Quantification system.[1] Cough test was performed without reducing the prolapse and filling bladder at least up to 300ml. Those patients undergoing concomitant surgery were classified as Group-A, while those undergoing only prolapse surgery were considered Group-B (Figure 1). A detailed history was taken from all, along with preoperative assessments. The operation was performed under spinal or general anaesthesia, according to patients' and surgeon's preference, followed by cystoscopy to identify any bladder injury.

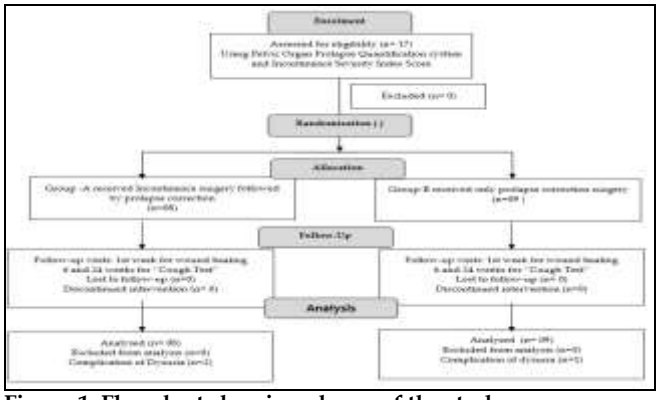


**Figure-1: Flowchart showing phases of the study**

The surgical method for prolapse repair was tailored to the specific compartment affected, as determined by the surgeon. The surgeon was a trained urogynaecologist. To minimize bias, all surgeries were performed by the same individual. Midurethral slings, pubourethral ligament plication and Burch colposuspension were allowed in combination surgery. Incontinence surgery was performed, followed by prolapse correction. The main outcome was complete dryness at 24 weeks following operation. Secondary outcomes included need for further intervention and complications (bleeding>500ml, injury to ureter, bowel, bladder, paralytic ileus, urinary retention, dysuria, wound infection). Further management included physiotherapy or surgery.

Severity of stress urinary incontinence was assessed by incontinence severity index score (ISI), which was created by multiplying the reported frequency (four levels) by the amount of leakage (three levels). The resulting index value (1-12) was further categorized into slight (1, 2), moderate (3, 4, 6), severe (8, 9), and very severe (12).[11,12] The ISI was assessed before and 6 months after surgery for all patients. Participants were followed-up at 1, 6, and 24 weeks after surgery. During 1st visit, wound healing was checked. For objective assessment at 6 weeks and 6 months after surgery, we carried out a cough stress test. 'Failure' was considered with a positive cough stress test. Those with a positive cough test were further given option of pelvic floor physiotherapy and surgery.

SPSS version 21 was used for statistical analysis. The normality of quantitative variables (age, body mass index, parity, duration of surgery, and hospital stay) was assessed by visual inspection of histograms and Q–Q plots. Normally distributed variables (age, body mass index, duration of surgery, and hospital stay) were summarized as Mean±SD and compared between the two groups using the independent samples t-test. Non-normally distributed data, including parity, were presented as median (interquartile range) and analysed using the Mann–Whitney U test. Categorical variables such as prolapse stage, type of surgery performed, cough stress test results, and complications were expressed as frequencies and percentages, and comparisons between groups were made using the Chi-square. All statistical tests were two-tailed, and a $p$-value <0.05 was considered statistically significant.

## RESULTS

Seventeen female patients were included in the study, with eight in Group-A (combined prolapse and incontinence surgery) and nine in Group-B (prolapse-only surgery). The baseline characteristics of both groups are shown in Table-1. Median age and BMI were comparable between the groups, while the duration of surgery was longer and hospital stay

slightly higher in Group-A. All quantitative variables were non-normally distributed and are therefore expressed as medians.

**Table-I: Baseline Characteristics of Study Participants (n = 17)**

| Variable | Group-A (n = 8) (Median) | Group-B (n = 9) (Median) | *p*-value |
|---|---|---|---|
| Age (years) | 52.00(53.75 – 50.25) | 54.00(54.50 – 52.00) | 0.236 |
| Body Mass Index (kg/m²) | 27.5(30.63 – 24.38) | 29.00(33.00 – 25.25) | 0.481 |
| Parity | 3.00(4.75 – 3.00) | 4.00(5.00 – 3.50) | 0.236 |
| Duration of Surgery (minutes) | 111.5 0(137.50 – 88.50) | 70 .00(85.75 – 54.25) | 0.008 |
| | 3.30(4.03 – 2.67) | 2.00(2.30 – 1.70) | 0.001 |

The surgical procedures performed are summarized in Table-2. In Group-A, the most frequent procedure was pubourethral ligament plication with anterior repair, followed by total abdominal hysterectomy with transobturator tape, while in Group-B, native tissue repair of cystocele and vaginal hysterectomy with anterior repair were most commonly performed.

**Table-II: Surgical Procedures Performed**

| Group | Surgical Procedure | Frequency (%) |
|---|---|---|
| Group-A (n=8) | Sacro hysteropexy + Burch | 1(12.5%) |
| | TAH + TOT | 2(25.0%) |
| | VH + TVT | 1(12.5%) |
| | TOT + Anterior Repair | 1(12.5%) |
| | PUL + Anterior Repair | 3(37.5%) |
| Group-B (n=9) | Native Tissue Repair of Cystocele | 5(55.5%) |
| | Vaginal Hysterectomy + Anterior Repair | 4(44.4%) |

*POP: Pelvic organ prolapse, SUI:Stress urinary incontinence, TAH:Total abdominal hysterectomy, TOT: Transobturator tape, VH:Vaginal hysterectomy, TVT:Transvaginal taping, PUL:Pubourethral ligament plication*

The distribution of pelvic organ prolapse stage and stress urinary incontinence (SUI) severity before and after surgery is presented in Table-3. Preoperatively, most patients in Group-A had moderate SUI, while those in Group-B had either slight or moderate SUI. At six months postoperatively, SUI improved in both groups, with only a few patients reporting slight residual symptoms. The only post-operative complication observed was dysuria for 2 patients in Group-A and 1 in Group-B.

Normality testing indicated that quantitative variables were not normally distributed; therefore, the Mann–Whitney U test was applied for group comparisons. Categorical variables were compared using the Chi-square test. A *p*-value less than 0.05 was considered statistically significant. There was no significant difference between the two groups in terms of age, BMI, or postoperative SUI. However, a statistically significant difference was observed in the duration of surgery and hospital stay between the groups. Table no 4 summarizes our findings.

**Table-III: Pelvic Organ Prolapse (POP) Stage and Severity of Stress Urinary Incontinence (SUI) Before and After Surgery**

| Parameter | | Group-A (n=8) Frequency (%) | Group-B (n=9) Frequency (%) | *p*-value |
|---|---|---|---|---|
| POP Stage | II | 4(50.0%) | 3(33.3%) | 0.486 |
| | III | 4(50.0%) | 6(66.7%) | |
| SUI Before Surgery | Slight | 1(12.5%) | 5(55.6%) | 0.134 |
| | Moderate | 6(75%) | 4(44.4%) | |
| | Severe | 1(12.5%) | _ | |
| SUI After Surgery (6 months) | None | 6(75%) | 3(33.3%) | 0.086 |
| | Slight | 2(25%) | 6(66.7%) | |

## DISCUSSION

In our study, almost 66% of patients who underwent prolapse repair alone required further treatment (physiotherapy) for persistent incontinence, compared with 25% in the combined surgery group. Additional surgical intervention was not performed because SUI was less severe or because the woman preferred to avoid additional surgical procedures and associated risks. Furthermore, studies have shown that Kegel exercises benefit new-onset SUI after mesh implantation.[13]

A study by Borstad *et al.,* has shown greater benefit from combination surgery, comparing the result of an incontinence procedure performed at the time of prolapse repair or 3 months later in women with pelvic organ prolapse (POP) and stress urinary incontinence (SUI). These were consistent with our results.[14] Maher *et al.,* conducted Cochrane-based systematic reviews to determine the effects of the many different surgeries used in the management of pelvic organ prolapse.[15] International guidelines recommend combining POP and SUI surgery for women with either clinical or subclinical SUI, supported by evidence from randomized controlled trials. Despite this, rates of concomitant SUI surgery vary considerably worldwide, ranging from 0.2% in

Denmark to 36% in the USA.[16] This variability underscores the limited global consensus on this recommendation and reflects varying patient and surgeon preferences.

Matsouka *et al.*, concluded that women with high-grade pelvic organ prolapse (POP) are considered at risk of developing postoperative stress urinary incontinence (SUI) once the prolapse has been repaired. The probable explanation for patients remaining subjectively continent is that POP can cause urethral kinking or compression.[17] Patients in combined surgery group who underwent pubourethral ligament plication (PUL) tested positive for cough stress incontinence at 6 months. The decision to select PUL was primarily based on patient preferences or financial considerations (e.g., inability to afford mesh or desire to avoid more extensive surgery). This suggests that PUL might be a reasonable alternative for certain patient populations, even if it doesn't fully resolve the stress incontinence based on objective testing. PUL may offer some relief for patients with mild to moderate SUI.[18]

In our study, there were no intraoperative complications in both groups. The only postoperative complication reported was transient dysuria, which was comparable in both groups. However, the length of operation and inpatient stay was significantly shorter in isolated prolapse surgery as compared to combined surgery ($p$=0.02 and $p$=0.002, respectively). This finding is consistent with a study by Husby *et al.*, which assessed the risk of an SUI operation after a uterine prolapse operation and compared the risk after the Manchester procedure versus vaginal hysterectomy. The number of adverse events was similar, but operative time and blood loss were both higher in the combined surgery group.[19]

A study by Zemtsov *et al.*, analyzed trends in treating stress urinary incontinence (SUI) during pelvic organ prolapse (POP) surgery (2011-2019), finding a significant decrease in SUI treatment rates alongside POP repair, especially after mesh-related warnings (like the FDA's OPUS study), showing shifting practices towards more conservative SUI management or addressing it separately.[20] Literature also highlighted a change in surgical approach, with fewer surgeons bundling SUI treatment with POP repair, likely influenced by safety concerns and evolving guidelines.[21]

Body mass index was found to be an independent risk factor for stress incontinence. The mean BMI of participants was 28.4±1.27. With every five unit rises in BMI the risk of incontinence increase by approximately 30% to 60% during 5 to 10 years. Weight loss should be the first line treatment option as with a decrease in 5% to 10% has efficacy similar to that of other nonsurgical incontinence interventions.

## LIMITATIONS OF STUDY

As a pilot study, this research provides an important initial exploration into the outcomes of prolapse surgery with or without concomitant SUI surgery. It can serve as a foundation for larger, more definitive studies in this area. However, there was few limitations of our study; due to the limited sample size, the findings may not be broadly applicable, and the follow-up was limited to 06 months; hence, we lack information on the status of women in both groups at a later stage.

## CONCLUSION

There is a risk of persistent incontinence after prolapse alone surgery; it should be combined with anti-incontinence surgery to reduce this risk. Proper counseling about the possible benefits and hazards of combined surgery is crucial, as perceptions of these vary between individuals and should be tailored to each woman. Further research with a bigger cohort and extended follow-up time is necessary. Longer-term follow-up at a median of 2 years with a larger sample size is underway.

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**Authors' Contribution**

Following authors have made substantial contributions to the manuscript as under:

SY & NH: Data acquisition, data analysis, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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