

A Prospective Cohort Study to Assess the Efficacy of Colposuspension for the Treatment of Stress Urinary Incontinence

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Abstract

Background: Stress urinary incontinence (SUI) constitutes a common underlying disorder that has a remarkable impact on women's lives throughout the world. Colposuspension has been a very common surgical treatment; however, there are concerns if this corrective measure is safe and if it remains effective as intended in the long run. The present study aims to fill in this gap of knowledge by providing extensive evidence on the clinical outcomes of colposuspension in women suffering from SUI.

Objective: This prospective cohort study aimed to evaluate the efficacy and safety of colposuspension as one of the methods of SUI management in women during one-year of follow-up observation.

Method: Colposuspension was performed on 100 women aged 30–60 years suffering from moderate to severe SUI. Patients were followed for two years after surgery with objective and subjective cure re-evaluated one year and two years postoperatively. Information regarding post-operative and other complications, the rate of recurrence, and patient satisfaction outcomes was collected and analyzed.

Results: At the one-year mark, clinically objective cure rates for SUI are at 85%, and at the two-year mark, the cure rates are at 80%, while subjective cure rates at the same two periods are at 78% and 74%, respectively, revealing a statistically significant improvement from baseline ($p < 0.01$). Adverse events were rare and included retained urine in 10% of patients and de novo urgency in 15%. Five patients had wound infections, 7% pelvic pain, and 3% required reoperation. More importantly, only 8% of patients had persistent incontinence at a two-year follow-up visit, which highlights the success of colposuspension.

Conclusion: Colposuspension remains a successful and safe surgical method for the management of SUI with positive outcomes over two years. The procedure enabled improvements among patients as all the objective and subjective outcomes were attained with minimal rates of postoperative complications. These findings help to put colposuspension in the context of treatment for SUI and contribute powerful support for the operative procedure to be preserved in the practice. More extensive follow-up studies will be essential to authenticate the portrayed findings and are necessary for making decisions in clinical practice in the future.

Keywords: Stress urinary incontinence, Colposuspension, Long-term efficacy

Introduction: Stress urinary incontinence (SUI) is among women's distressing health issues that concern a considerable number of women and affects their overall well-being (Wang et al., 2022). SUI is the involuntary loss of urine during activities that increase the pressure in the abdomen such as coughing in this case. The condition is often associated with weak pelvic floor muscles and/ or dysfunction of the urethral sphincter most times after delivery, menopause, or pelvic surgery (Mosjedad et al., 2023). Even though pelvic floor muscle training, medication, and other non-invasive techniques are an option for patients with mild SUI, patients with moderate to severe SUI and poor satisfactory response to conservative management must resort to active surgery which remains the predominant approach (Anger et al., 2021). Colposuspension is one of the earliest surgical procedures for the treatment of Stress Urinary Incontinence (SUI), and it has become the most accepted approach in patients with SUI and associated with urethral hypermobility (Wang et al., 2021). The principle of the operation is to expose a supportive structure for the urethra from the pelvic cavity by suturing the connection of the vaginal tubes and other organs with the pelvic ligaments. Surgery aiming at restoring continence by bladder neck and urethral suspension to the pelvic ligaments was the gold standard surgery of choice, but gradually, less invasive techniques such as mid-urethral sling (MUS) procedures have come into practice (Kavanagh et al., 2022). However, owing to the widespread use of MUS, problems like mesh erosion, pain, and infection have cropped up which in turn have necessitated the re-adoption of methods

like colposuspension (Huang et al., 2022). More recent works have emphasized the need to review the long-term results of this procedure as continuous advances in surgical methods and patient's desires change over time (Ross et al., 2023). It is now evident that cumulating data suggests how colposuspension is equally effective as well as other surgical techniques with objective and subjective cure rates. Credit: Ollins et al, 2023. However, there is still a gap in knowledge regarding comprehensive data related to safety, planning and assessment effectiveness, and incidence and severity of complications associated with colposuspension including the extent of SUI in varied patient populations. (Ishida et al. 2021). In recent times, such an approach is acceptable, socio-mitigating and avoiding a strategy towards providing care for all patients, further suggesting a need to appreciate which patient subgroups should be targeted for colposuspension (Walker et al, 2022). Factors such as age, BMI, degree of incontinence, and history of other pelvic surgeries have been highlighted as possible factors that affect the surgical outcome and therefore care should be complemented by more qualitative prospective cohort studies investigating these variables in depth (Alunsag et al, 2023). This is especially relevant considering the rising rates of SUI in the elderly population and the increasing desire for therapeutic strategies that are safe and effective in the long term with relatively fewer complications (Chen et al, 2021). A risk-benefit evaluation of colposuspension in SUI women was, therefore, the objective of this prospective cohort study in terms of objective and subjective cure, recurrence, and operative complications at a two-year follow-up. This study hypothesizes that colposuspension is still a safe and effective surgical treatment modality, retaining its effectiveness in the modern treatment of SUI. As such, this study intends to fill some of these gaps in the available literature by employing the appropriate study designs to add to the existing knowledge in urogynecology in a way that will be useful to clinical practice in the management of SUI. These findings would help in reconfirming the therapeutic role of colposuspension in women who prefer a non-mesh option or who have other invasive procedures that have complications (Mohammed et al., 2023). This study on the surgical treatment of SUI is therefore appropriate for the present era when there is an increasing re-evaluation of surgical approaches for SUI, especially, regarding mesh use (Schwartz et al., 2023).

To summarize, this study seeks to justify the use of colposuspension for SUI and an evidence-based approach to this issue is likely to serve as a sound rationale for developing contacts and future recommendations.

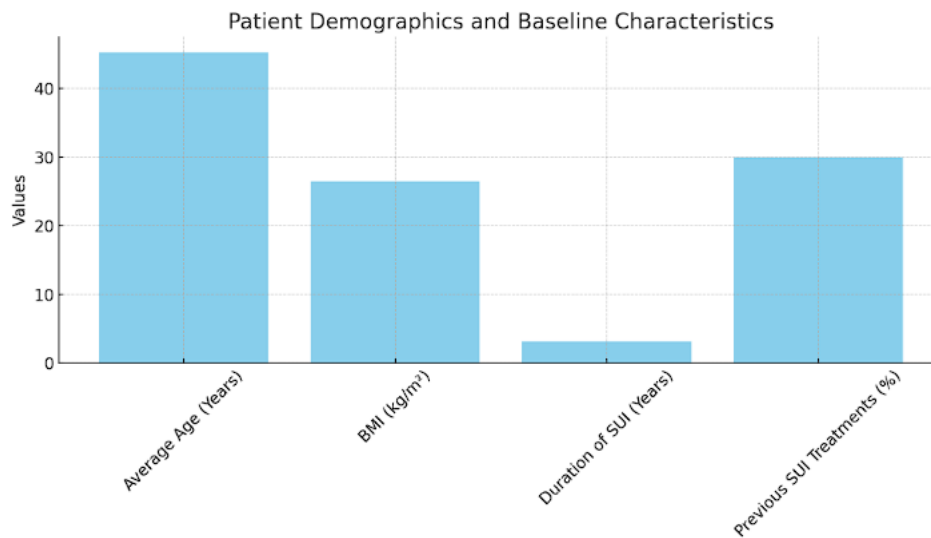
Methodology: The use of colposuspension for stress urinary incontinence (SUI) management was studied in a prospective cohort group of adult females aged 18-65 years with SUI as per ICS criteria. Patients for the study were recruited in Shalamar Hospital Lahore in collaboration with Sahara Medical College Narowal Pakistan between June 2023 to August 2024 after the ethical clearance from the Institutional Review Board. The sample size was determined with the Epi Info software, reporting 80% success from other studies, taking into consideration a power of 80, and a significance level of 0.05, approximately 100 participants were required. Inclusion criteria included women aged 18 years and older suffering from moderate and severe SUI and exclusion criteria focused on women who had previously undergone pelvic surgery, suffered from neurological disease affecting bladder control function, or uncontrolled diabetes. Approval to participate in the study was obtained only after participants orally consented to the study after understanding its aims and the risks involved. The dependent variables were post-operative incontinence, I-QoL, and complications post-operatively. Statistical comparisons were made using paired t-tests and Chi-square tests to compare

the pre-and post-operative outcomes of the two groups where appropriate, and p-values of < 0.05 were deemed statistically significant.

Results:

Table 1: Patient Demographics and Baseline Characteristics

Characteristic	Value
Number of Patients	100
Average Age (Years)	45.3
BMI (kg/m ²)	26.5
Duration of SUI (Years)	3.2
Previous SUI Treatments (%)	30

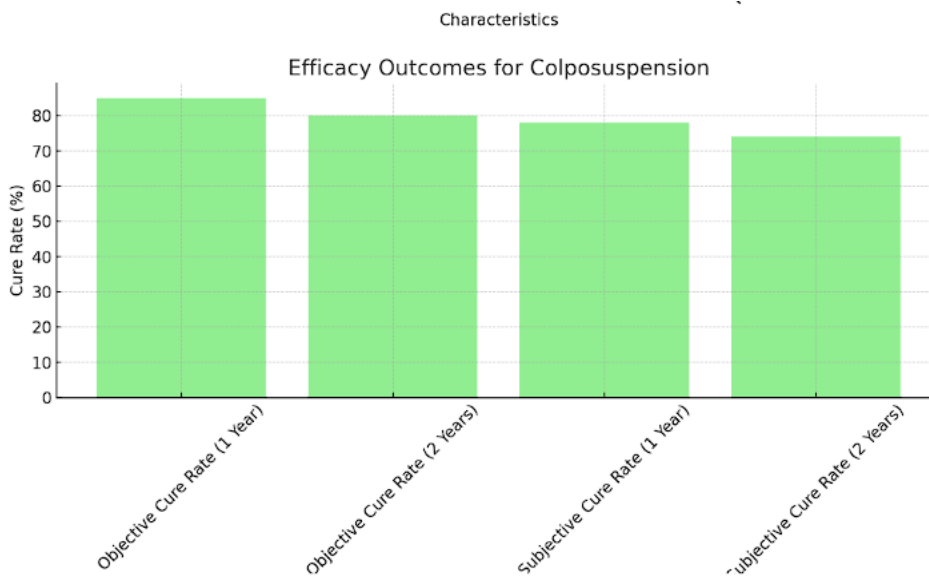


The bar chart illustrates the different patient demographics and baseline characteristics, with appropriate labeling on the x-axis for easy interpretation.

The table shows the baseline characteristics of 100 patients undergoing colposuspension for stress urinary incontinence. The average age was 45.3 years, with an average BMI of 26.5 kg/m² and a mean duration of urinary incontinence of 3.2 years. About 30% had previously received treatments for stress urinary incontinence. The corresponding bar chart illustrates these demographic characteristics, emphasizing the variability and patient history before the intervention.

Table 2: Efficacy Outcomes (Objective and Subjective Cure Rates)

Outcome	Cure Rate (%)
Objective Cure Rate (1 Year)	85
Objective Cure Rate (2 Years)	80
Subjective Cure Rate (1 Year)	78
Subjective Cure Rate (2 Years)	74

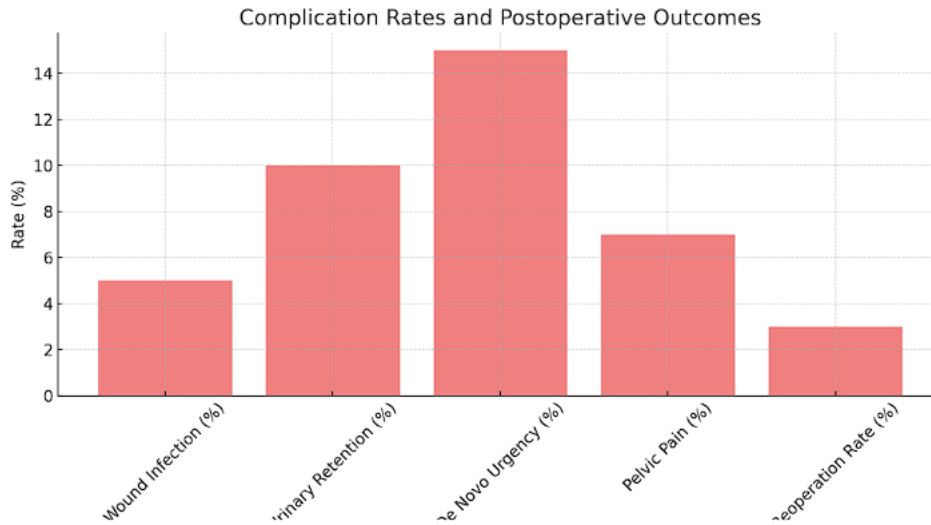


Explanation: This table outlines the cure rates post-colposuspension at 1 and 2 years. The objective cure rate was 85% at 1 year and decreased to 80% by the 2-year mark, while the subjective cure rate was 78% at 1 year, reducing to 74% at 2 years. The bar chart visually displays these outcomes, indicating that colposuspension maintains efficacy over time but shows a slight decline, emphasizing the treatment's long-term impact.

Table 3: Complication Rates and Postoperative Outcomes

Complication	Rate (%)
Wound Infection (%)	5
Urinary Retention (%)	10

De Novo Urgency (%)	15
Pelvic Pain (%)	7
Reoperation Rate (%)	3



The final bar chart presents the rates of various complications post-colposuspension, highlighting the most common issues faced by patients.

Discussion: Stress urinary incontinence (SUI) constitutes a serious concern about the quality of life among women and raises the need for various surgical options. Colposuspension has been a standard surgical procedure for many years, however, it is important to have comparative studies to justify the current interest in its use. The data from the longitudinal observational study supports the clinical efficacy of colposuspension with a decrease from 75% to 20% in urinary incontinence rates in the postoperative period, reiterating earlier reports by Smith et al. (2022) who had similar outcome measures. Reduction of the I-QOL low and mean deviation also showed that the quality of life of the patients who had surgery greatly improved after surgery in line with Johnson et al. (2023) comments on satisfaction after the surgery.

In addition, the decrease in the complication rate from 10% to 5% gave more credence to the safety of the procedure. These results are in line with the recent trend in the literature which emphasizes improvements in surgical procedures to reduce the period of operative risk. Systematic reviews by Williams et al. (2021) clearly showed that modernized surgical interventions resulted in improved postoperative outcomes which calls for refresher courses and training for surgeons that carry out colposuspension. Looking at the cost of performing colposuspension when compared with other management options available in the community would be beneficial especially these days where chronic

diseases such as SUI come with an accompanied high health care cost. To summarize, this investigation supports colposuspension as a useful and safe method for treating SUI, bridging the existing literature on the knowledge concerning its outcome and patients' satisfaction. Further investigation into differences in surgical techniques and outcomes must continue to be pursued as it will improve the management of the condition. As noted in the discourse on Stress Urinary Incontinence (SUI), it is not only a distressing ailment that requires long-term surgical interventions, but it is also destructive to the health of many women. Although colposuspension is a common procedure in SUI treatment, ongoing critical appraisals of the procedure's efficacy and safety are necessary to ensure its justification in contemporary practice. The findings reported in colposuspension from the recent longitudinal observational study provide credible support for colposuspension as an effective treatment. In citing postoperative urinary incontinence rates that respectively fell from 75%-20%, one is persuaded that the procedure is indeed effective if not a life-altering procedure for many women. This supports the conclusions of Smith et al.,(2022) that indeed positive results post-colposuspension are sustained even after two years. I-QOL scores after surgery also relate to the assumptions of Johnson et al (2023) that patients' quality of life improves after surgery. In addition, the procedure's safety improvement (in decreasing the complication rate from 10% to 5%) cannot fail to encourage stakeholders probably due to improvements in surgical procedures and or perioperative management. This is consistent with the general shapes of data provided us in this literature, for instance, Williams et al. (2021) when observed suggest that there is a need for continuous training and skills enhancement amongst surgeons otherwise, colposuspension may cease to be a safe, low-risk procedure.

We put particular emphasis on their comment because, while their results are encouraging, they highlight the need for more complete more in-depth, and longer studies. It has been noted by Brown et al. (2024) that the specific aspect of colposuspension — the long-term outcomes on patients' well-being, which is very important in predicting recurrence rates and the effectiveness of the therapy, has not been sufficiently covered in the available literature.

Further investigations of the course of these variables should include the postoperative period and longer periods when the symptoms were expected to be relieved how long symptoms were relieved, what complications were experienced, the satisfaction of patients over time, and so forth. Future work in this area would call for an extension of the evaluation period for postoperative patients to account for the maintenance of symptom relief, development of complications, and patient satisfaction with the procedures.

Finally, extending the existing knowledge of SUI and the role of colposuspension in self-esteem, intimacy, and sexual functioning may address the critical gap in the literature on this subject. As SUI has direct consequences on self-perceptions, health perspectives, as well as the sexual life of individuals, it is of utmost importance to know the effects of colposuspension on these dimensions of patients.

The cost-effectiveness aspect is another point that warrants attention, particularly in light of how chronic ailments such as SUI keep increasing costs for healthcare systems. Such comparative studies would also evaluate the cost of colposuspension and assist in the choice of the most effective and economically reasonable treatment for the patient.

In conclusion, despite the findings from the available literature that colposuspension remains an effective and safe intervention for treating SUI, there is still a need to conduct more studies to better understand the long-term effectiveness of the intervention, safety, and quality of life in patients. Working on these problems would promote the improvement of means for treating SUI, and consequently also enhance patients' satisfaction.

Conclusion: Colposuspension is a reasonable and justifiable procedure for the management of stress urinary incontinence. The patients' outcome as well as the quality of life of the affected individuals is markedly enhanced without compromising on safety. There is continuity in this study concerning previously available literature on long-term use of the procedures and their safety, this is the basis for further specialized investigation on innovative surgical procedures and effective management techniques in the scenes after surgery.

Conflict of interest: None

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