# Evaluating the Impact of Valsalva Leak Point Pressure and Urge Incontinence on the Success of Transobturator Tape Surgery for Stress Urinary Incontinence

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## Abstract

**Objective:** This study aimed to investigate factors influencing the surgical outcomes of patients undergoing transobturator tape (TOT) surgery for stress urinary incontinence (SUI), focusing on the predictive value of Valsalva Leak Point Pressure (VLPP) and the presence of urge incontinence.

**Material and Methods:** A retrospective study was conducted involving 117 patients from 561 who underwent TOT surgery between May 2017 and March 2024. We excluded patients with prior pelvic surgeries or neurogenic bladder, and included SUI with urethral hypermobility as an inclusion criterion. We performed urodynamic testing, including VLPP measurement, preoperatively. Postoperative outcomes were evaluated using stress tests, the International Consultation on Incontinence Questionnaire- Short Form (ICIQ-SF), and assessments of urge incontinence and cystocele presence.

**Results:** Postoperative stress tests revealed 14.5% failure and 85.5% success rates. We observed significant differences in urinary incontinence (UI) amount based on VLPP values (p = 0.001), where lower VLPP was associated with higher postoperative UI rates. Urge incontinence had a significant impact on postoperative UI (p = 0.023), but it did not correlate with preoperative UI frequency. Postoperatively, ICIQ-SF scores and impact on daily life showed significant improvement (p <0.001). ROC analysis indicated that the impact on daily life was a significant predictor of surgical success (p = 0.035).

**Conclusion:** TOT surgery may significantly improve urinary incontinence symptoms and have a positive impact on daily life. However, a VLPP of less than 90 cmH2O is associated with higher rates of postoperative UI, suggesting a potential intrinsic sphincter deficiency (ISD). Post-surgical urge incontinence presents a significant challenge for individuals, likely due to detrusor muscle overactivity following the surgery. We need further research to refine predictive measures and improve surgical techniques.

**Keywords:** stress urinary incontinence, transobturator tape, urge incontinence, valsalva leak point pressure

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## INTRODUCTION

In many societies, approximately 10–25% of the population seeks treatment for urinary incontinence at urology and gynecology clinics. The prevalence of stress urinary incontinence (SUI) in the general population has been reported to range from 5% to 69% (1). SUI has been reported in 4.7% of nulliparous women, 6.9% of those who delivered via cesarean section, and 12.2% of those with a history of vaginal delivery (2). Due to its high prevalence and economic burden, researchers continue to search for effective treatment methods.

Surgical intervention is typically considered when conservative measures fail. Among surgical options, midurethral sling procedures—especially minimally invasive ones—are widely used, resulting in increased surgical intervention rates for urinary incontinence (UI) in women. Although these sling surgeries are highly effective, they have a failure rate of approximately 20%, and the success rate for repeat surgeries is significantly lower (3). Therefore, the role of urodynamic testing in predicting surgical outcomes and guiding preoperative counseling has become increasingly important.

Some authors argue that the first surgical procedure for a patient with incontinence should ideally be the last. They emphasize the importance of a differential diagnosis based not only on clinical history but also on urodynamic studies to determine the appropriate intervention (4). However, guidelines from the National Institute for Health and Care Excellence (NICE) and the U.S. Agency for Health Care Policy and Research (AHCPR) recommend against routine urodynamic testing prior to conservative treatment. These organizations state that for patients with a clear clinical diagnosis of SUI, history-taking and simple urogynecological tests are often sufficient, eliminating the need for additional urodynamic evaluation (5, 6).

The evaluation of patients with SUI should begin with simple and non-invasive assessments. More complex and costly procedures such as urodynamics should be reserved for selected cases—particularly those with neurological conditions or when the type of incontinence remains unclear based on history and clinical findings.

The International Continence Society (ICS) defines the Valsalva Leak Point Pressure (VLPP) as the intravesical pressure at which urine leakage occurs due to increased abdominal pressure during the Valsalva maneuver. VLPP is considered a quantitative measure of SUI severity (7). Intrinsic sphincter deficiency (ISD), which is generally associated with low VLPP values, is linked to more severe urinary leakage. Preoperative urodynamic studies have demonstrated that patients with low VLPP values are at increased risk of surgical failure (8, 9).

Several factors influence urethral pressure measurements, including age—particularly advanced age—postural changes, and both voluntary and involuntary contractions of the pelvic floor muscles (10). Moreover, VLPP measurements may be unreliable in patients with detrusor overactivity or low bladder compliance. The catheter diameter also affects VLPP readings, with larger catheters yielding higher pressure values (11).

In this study, we aimed to investigate the factors that positively or negatively affect surgical outcomes in patients who underwent the Transobturator Tape (TOT) procedure for the treatment of SUI.

## MATERIALS AND METHODS

The study was approved by our hospital's Clinical Research Ethics Committee under approval number 2024/01/11/011 on 2024-01-24. This retrospective study included 117 patients—selected from a total of 561—who had complete urodynamic data and underwent TOT surgery for SUI at our urology and gynecology clinics between May 2017 and March 2024. Written informed consent was obtained from all participants.

Inclusion criteria were defined as SUI associated with urethral hypermobility, in accordance with the guidelines of the ICS. Exclusion criteria included patients without urodynamic testing, those who had previously undergone pelvic surgery or radiotherapy, individuals with prior incontinence surgery, and patients diagnosed with neurogenic bladder or psychiatric disorders.

Demographic and clinical data, including age, height, weight, body mass index (BMI), number of vaginal and cesarean deliveries, and comorbidities, were recorded.

Urodynamic testing was performed using the Locum Plus system (Aymed, Türkiye), following ICS guidelines. Although current guidelines suggest reserving urodynamic evaluation for complex or ambiguous cases, our institution routinely performs preoperative urodynamic testing for all patients undergoing midurethral sling surgery. This policy is based on institutional protocol aimed at improving surgical planning and identifying occult detrusor overactivity or ISD, which could influence postoperative outcomes. As such, all patients in this study underwent urodynamic testing regardless of symptom complexity. VLPP values were stratified into two categories: <90 cm $H_2O$ and >90 cm $H_2O$. Patients with VLPP <60 cm $H_2O$ who were diagnosed with ISD and treated with periurethral bulking agents were excluded from the study.

All patients underwent a preoperative clinical evaluation, including medical history, physical examination, and urodynamic assessment. The International Consultation on Incontinence Questionnaire–Short Form (ICIQ-SF) was completed preoperatively and postoperatively. Data on urge incontinence and cystocele were also documented. Frequency, volume, and the impact of urge incontinence on daily life were evaluated separately.

Based on the presence or absence of urge incontinence in the preoperative assessment, 93 patients (79.5%) were classified as having pure stress urinary incontinence, and 24 patients (20.5%) were considered to have mixed urinary incontinence. This classification was used in the comparative analysis of surgical outcomes.

All surgical procedures were performed by the same urologist and gynecologist, each with a minimum of five years of experience in urogynecology. A standardized stress test was conducted for all patients both before and after surgery. A positive postoperative stress test result was considered indicative of treatment failure.

The 90 cm $H_2O$ threshold for VLPP was selected based on previous literature, which suggests that this value more accurately identifies patients at risk of intrinsic sphincter deficiency compared to lower cut-off points.

**Statistical Analysis**

Statistical analyses were conducted using IBM SPSS Statistics for Windows, version 29.0 (IBM Corp., Armonk, NY, USA). The normality of continuous variables was assessed using the Shapiro–Wilk test. Normally distributed variables were expressed as mean ± standard deviation (SD), while non-normally distributed variables were presented as median and interquartile range (IQR). Categorical variables were summarized as frequencies and percentages.

The Chi-square test was used to assess associations between categorical demographic and clinical variables (e.g., VLPP category, presence of urge incontinence, and postoperative stress test results). The Independent Samples T-test was used to compare continuous variables between two groups (e.g., VLPP <90 cm $H_2O$ vs >90 cm $H_2O$). The Paired Samples T-test was applied to compare preoperative and postoperative ICIQ-SF scores and their impact on daily life.

To identify independent predictors of surgical success—defined as a negative result on the postoperative stress test—a binary logistic regression analysis was performed. Results were presented as odds ratios (ORs) with 95% confidence intervals (CIs).

Receiver Operating Characteristic (ROC) curve analysis was used to evaluate the predictive accuracy of the preoperative "impact on daily life" score for surgical outcomes. The area under the curve (AUC), optimal cut-off value, sensitivity, and specificity were reported.

A p-value of <0.05 was considered statistically significant.

**RESULTS**

This current study aimed to evaluate the differences in the frequency, volume, and impact of UI on daily activities between the preoperative and postoperative periods. Additionally, we investigated the role of VLPP values in predicting surgical efficacy and their correlation with urinary incontinence. The analysis focused on assessing the effectiveness of surgery in treating pelvic organ prolapse and UI, the influence of detrusor overactivity on treatment outcomes, and the prognostic value of VLPP.

Tables 1 and 2 summarize the demographic and clinical characteristics of the study participants. Postoperative stress test results revealed that 85.5% of patients had successful outcomes, while 14.5% experienced surgical failure. Comparative analyses based on VLPP values, presence of urge incontinence, and stress test results are presented in Tables 3A–C.

A significant difference was observed in the amount of UI after surgery (p = 0.001). Specifically, among patients with VLPP <90 cm $H_2O$, only 16.7% reported no UI, while 83.3% of patients with VLPP >90 cm $H_2O$ were free of UI. Conversely, 94.4% of patients who experienced a small amount of UI belonged to the VLPP <90 cm $H_2O$ group, compared to only 5.6% in the >90 cm $H_2O$ group. These findings suggest that patients with VLPP <90 cm $H_2O$ may have concurrent ISD. Patients with urge incontinence demonstrated less favorable postoperative stress test results, indicating a potential negative association. While no significant relationship was observed between urge incontinence and preoperative UI frequency or volume, urge incontinence was significantly associated with increased UI symptoms in the postoperative period. This may be attributed to de novo detrusor overactivity emerging after surgery. The frequency and volume of postoperative UI were found to be strongly associated with surgical success, highlighting their importance as indicators of treatment efficacy.

**Table 1.** Mean and Standard Deviation of Demographic Values

| Variables | Mean ± SD | Min-Max |
|---|---|---|
| Height (cm) | 159.08 ± 6.58 | 149-172 |
| Weight (kg) | 76.85 ± 11.38 | 58-115 |
| BMI (kg/m²) | 30.4 ± 2.6 | 15.4-51.1 |
| Age (years) | 50.03 ± 8.64 | 30-71 |
| Number of Births | 3.20 ± 1.64 | 1-10 |
| Number of Vaginal Deliveries | 2.79 ± 1.76 | 0-10 |
| Number of Cesarean Deliveries | 0.41 ± 0.83 | 0-4 |
| Preoperative Impact on Daily Life Score | 8.36 ± 1.56 | 3-10 |
| Preoperative ICIQ-SF Score | 18.17 ± 2.97 | 6-21 |
| Postoperative Impact on Daily Life Score | 2.25 ± 2.55 | 0-10 |
| Postoperative ICIQ-SF Score | 5.30 ± 5.20 | 0-20 |
| VLPP | 119.95 ± 29.56 | 58-240 |

**Table 2.** Demographic and Clinical Characteristics of Patients

| Category | n | Percentage(%) |
|---|---|---|
| **Comorbidities** | | |
| Absent | 48 | 41.0 |
| Present | 69 | 59.0 |
| **Pelvic Organ Prolapse Quantification (POP-Q)** | | |
| C-0 | 13 | 11.1 |
| C-1 | 5 | 4.3 |
| C-2 | 15 | 12.8 |
| C-3 | 8 | 6.8 |
| C-4 | 32 | 27.4 |
| C-5 | 16 | 13.7 |
| C-6 | 18 | 15.4 |
| C-7 | 6 | 5.1 |
| C-8 | 4 | 3.4 |
| **VLPP (cmH₂O)** | | |
| VLPP <90 cm H2O | 19 | 16.2 |
| VLPP >90 cm H2O | 98 | 83.8 |
| **Stress Test (Postoperative)** | | |
| Positive | 17 | 14.5 |
| Negative | 100 | 85.5 |
| **Urge Incontinence** | | |
| Absent | **93** | **79.5** |
| Present | 24 | 20.5 |
| **Cystocele** | | |
| Absent | **98** | **83.8** |
| Grade 1 | 10 | 8.5 |
| Grade 2 | 9 | 7.7 |

As shown in Table 4, significant improvements were observed in both ICIQ-SF scores and the impact on daily life following surgery (p <0.001), indicating a substantial reduction in both UI symptoms and their daily burden. Furthermore, Table 5 and Figure 1 present the results of ROC curve analysis, which showed that the preoperative impact on daily life score was a statistically significant predictor of surgical success (p = 0.035). The model demonstrated acceptable predictive accuracy, suggesting that this variable may be valuable for preoperative evaluation.

**Table 3A.** Comparison of clinical characteristics according to VLPP groups

| Variables | VLPP <90 cmH2O (n,%) | VLPP >90 cmH2O (n,%) | p-value |
|---|---|---|---|
| **Comorbodities** | | | 0.614 |
| Absent | (9, 18.8%) | (39, 81.3%) | |
| Present | (10, 14.5%) | (59, 85.5%) | |
| **POP-Q** | | | **0.047*** |
| C-0 | (1, 7.7%) | (12, 92.3%) | |
| C-1 | (1, 20.0%) | (4, 80.0%) | |
| C-2 | (7, 46.7%) | (8, 53.3%) | |
| C-3 | (0, 0.0%) | (8, 100.0%) | |
| C-4 | (6, 18.8%) | (26, 81.3%) | |
| C-5 | (2, 12.5%) | (14, 87.5%) | |
| C-6 | (1, 5.6%) | (17, 94.4%) | |
| C-7 | (1, 16.7%) | (5, 83.3%) | |
| C-8 | (0,0.0%) | (4,100.0%) | |
| **Cystocele** | | | |
| Absent | (19, 19.4%) | (79, 80.6%) | |
| Grade 1 | (0, 0.0%) | (10, 100.0%) | |
| Grade 2 | (0, 0.0%) | (9, 100.0%) | |
| **Frequency of Urinary Incontinence (Preoperative)** | | | **0.019*** |
| Absent | (2, 50.0%) | (2, 50.0%) | |
| Once a Week or Less | (0, 0.0%) | (5, 100.0%) | |
| 2-3 Times a Week | (0, 0.0%) | (26, 100.0%) | |
| Several Times a Day | (17, 20.7%) | (65, 79.3%) | |
| **Amount of Urinary Incontinence (Preoperative)** | | | 0.650 |
| Mild | (2, 28.6%) | (5, 71.4%) | |
| Moderate | (4, 12.5%) | (28, 87.5%) | |
| Severe | (13, 16.7%) | (65, 83.3%) | |
| **Amount of Urinary Incontinence (Postoperative)** | | | **0.001*** |
| None | (7, 16.7%) | (35, 83.3%) | |
| Little | (3, 5.6%) | (51, 94.4%) | |
| Moderate | (9, 42.9%) | (12, 57.1%) | |
| **Frequency of Urinary Incontinence (Postoperative)** | | | 0.619 |
| None | (7, 16.7%) | (35, 83.3%) | |
| Once a Week or Less | (4, 11.1%) | (32, 88.9%) | |
| 2-3 Times a Week | (2, 14.3%) | (12, 85.7%) | |
| Several Times a Day | (3, 33.3%) | (6, 66.7%) | |

*Chi-Square Analysis*

**Table 3 B.** Comparison of clinical characteristics according to urge incontinence

| Variables | Urge Incontinence: Present (n,%) | Urge Incontinence: Absent (n,%) | p-value |
|---|---|---|---|
| **Comorbodities** | | | 0.390 |
| Absent | (40, 83.3%) | (8, 16.7%) | |
| Present | (53, 76.8%) | (16, 23.2%) | |
| **POP-Q** | | | 0.839 |
| C-0 | (10, 76.9%) | (3, 23.1%) | |
| C-1 | (4, 80.0%) | (1, 20.0%) | |
| C-2 | (12, 80.0%) | (3, 20.0%) | |
| C-3 | (5, 62.5%) | (3, 37.5%) | |
| C-4 | (24, 75.0%) | (8, 25.0%) | |
| C-5 | (13, 81.3%) | (3, 18.8%) | |
| C-6 | (17, 94.4%) | (1, 5.6%) | |
| C-7 | (5, 83.3%) | (1, 16.7%) | |
| C-8 | (3,75.0%) | (1,25.0%) | |
| **Cystocele** | | | 0.121 |
| Absent | (81, 82.7%) | (17, 17.3%) | |
| Grade 1 | (6, 60.0%) | (4, 40.0%) | |
| Grade 2 | (6, 66.7%) | (3, 33.3%) | |
| **Frequency of Urinary Incontinence (Preoperative)** | | | 0.249 |
| Absent | (4, 100.0%) | (0, 0.0%) | |
| Once a Week or Less | (3, 60.0%) | (2, 40.0%) | |
| 2-3 Times a Week | (23, 88.5%) | (3, 11.5%) | |
| Several Times a Day | (63, 76.8%) | (19, 23.2%) | |
| **Amount of Urinary Incontinence (Preoperative)** | | | 0.855 |
| Mild | (5, 71.4%) | (2, 28.6%) | |
| Moderate | (26, 81.3%) | (6, 18.8%) | |
| Severe | (62, 79.5%) | (16, 20.5%) | |
| **Amount of Urinary Incontinence (Postoperative)** | | | **0.001*** |
| None | (42, 100.0%) | (0, 0.0%) | |
| Little | (35, 64.8%) | (19, 35.2%) | |
| Moderate | (16, 76.2%) | (5, 23.8%) | |
| **Frequency of Urinary Incontinence (Postoperative)** | | | **0.001*** |
| None | (42, 100.0%) | (0, 0.0%) | |
| Once a Week or Less | (21, 58.3%) | (15, 41.7%) | |
| 2-3 Times a Week | (9, 64.3%) | (5, 35.7%) | |
| Several Times a Day | (7, 77.8%) | (2, 22.2%) | |

*Chi-Square Analysis*

**Table 3C.** Comparison of clinical characteristics according to postoperative stress test results

| Variables | Stress Test Negative (n,%) | Stress Test Positive (n,%) | p-value |
|---|---|---|---|
| **Comorbodities** | | | 0.544 |
| Absent | (8, 16.7%) | (40, 83.3%) | |
| Present | (9, 13.0%) | (60, 87.0%) | |
| **POP-Q** | | | 0.512 |
| C-0 | (1, 7.7%) | (12, 92.3%) | |
| C-1 | (0, 0.0%) | (5, 100.0%) | |
| C-2 | (2, 13.3%) | (13, 86.7%) | |
| C-3 | (1, 12.5%) | (7, 87.5%) | |
| C-4 | (3, 9.4%) | (29, 90.6%) | |
| C-5 | (5, 31.3%) | (11, 68.8%) | |
| C-6 | (4, 22.2%) | (14, 77.8%) | |
| C-7 | (1, 16.7%) | (5, 83.3%) | |
| C-8 | (0.0%, ) | (100.0%, ) | |
| **Cystocele** | | | |
| Absent | (15, 15.3%) | (83, 84.7%) | 0.862 |
| Grade 1 | (1, 10.0%) | (9, 90.0%) | |
| Grade 2 | (1, 11.1%) | (8, 88.9%) | |
| **Frequency of Urinary Incontinence (Preoperative)** | | | 0.882 |
| Absent | (1, 25.0%) | (3, 75.0%) | |
| Once a Week or Less | (1, 20.0%) | (4, 80.0%) | |
| 2-3 Times a Week | (3, 11.5%) | (23, 88.5%) | |
| Several Times a Day | (12, 14.6%) | (70, 85.4%) | |
| **Amount of Urinary Incontinence (Preoperative)** | | | 0.531 |
| Mild | (0, 0.0%) | (7, 100.0%) | |
| Moderate | (5, 15.6%) | (27, 84.4%) | |
| Severe | (12, 15.4%) | (66, 84.6%) | |
| **Amount of Urinary Incontinence (Postoperative)** | | | **0.001*** |
| None | (0, 0.0%) | (42, 100.0%) | |
| Little | (5, 9.3%) | (49, 90.7%) | |
| Moderate | (12, 57.1%) | (9, 42.9%) | |
| **Frequency of Urinary Incontinence (Postoperative)** | | | **0.001*** |
| None | (0, 0.0%) | (42, 100.0%) | |
| Once a Week or Less | (1, 2.8%) | (35, 97.2%) | |
| 2-3 Times a Week | (3, 21.4%) | (11, 78.6%) | |
| Several Times a Day | (3, 33.3%) | (6, 66.7%) | |

*Chi-Square Analysis*

**Table 4.** Preoperative and Postoperative ICIQ-SF Scores and Mean Impact on Daily Life

| Variables | Mean ± SD | N | SD | Test Value | P Value |
|---|---|---|---|---|---|
| ICIQ-SF Score (Preoperative) | 18.17 | 117 | 2.972 | 26.488 | <0.001* |
| ICIQ-SF Score (Postoperative) | 5.30 | 117 | 5.205 | | |
| Impact of Daily Life (Preoperative) | 8.36 | 117 | 1.56 | 24.991 | <0.001* |
| Impact of Daily Life (Postoperative) | 2.25 | 117 | 2.55 | | |

*Paired Sample T Test, *P<0.05*

**Table 5.** The ROC analysis for positive prognostic factors associated with Operation Success

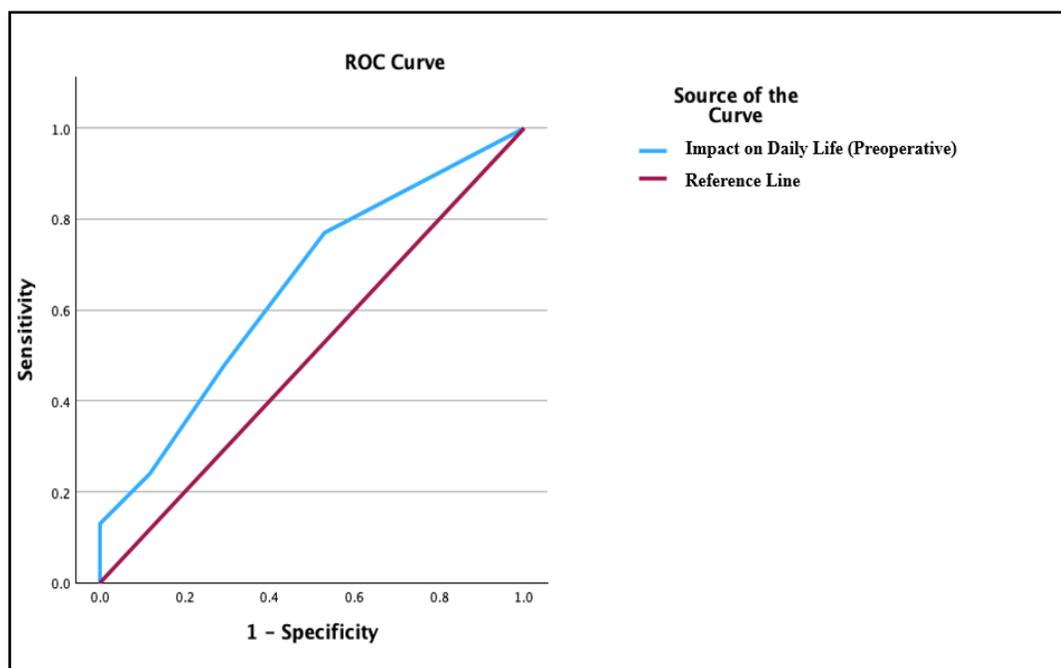| Parameters | Cut-off value | Sensitivity (%) | Specificity (%) | AUC (%95 CI) | P Value |
|---|---|---|---|---|---|
| Impact of Daily Life (Postoperative) | 9.500 | 0.770 | 0.470 | 0.650 (0.510-0.787) | 0.035* |

*ROC Analysis P<0.05*



**Figure 1.** The ROC curve for positive prognostic factors associated with operation success

## DISCUSSION

In incontinence surgery, the most critical factor influencing success is not only the surgical technique itself but also its appropriateness for the individual patient. A major limitation of symptom-based diagnosis is its inability to classify the type of SUI accurately. An accurate diagnostic strategy is essential for achieving favorable surgical outcomes. In a study of 206 patients, Sahin et al. found that symptom-based diagnosis had a sensitivity of 80.2%, specificity of 57.3%, a PPV of 59.8%, and an NPV of 78.5%, suggesting that reliance solely on patient history may reduce treatment success (12).

Urodynamic testing remains the most reliable tool for evaluating urethral function in SUI. In healthy individuals, leakage should not occur with increased abdominal pressure. Leakage at high pressures (>90 cm $H_2O$) typically indicates urethral hypermobility, whereas leakage at low pressures (<60 cm $H_2O$) is suggestive of ISD (13, 14). In our study, 94.4% of patients who experienced postoperative UI had VLPP values <90 cm $H_2O$, suggesting a strong association with ISD.

Some studies report that large cystoceles can artificially elevate VLPP measurements by buffering abdominal pressure or compressing the urethra (15). In our cohort, however, neither POP-Q classification nor cystocele grade 1–2 significantly impacted surgical outcomes. Grade 3 cystocele cases were excluded as they required additional prolapse surgery.

VLPP threshold values have been widely studied to guide surgical decision-making in SUI. Cut-off points such as 60, 70, and 90 cm $H_2O$ are frequently referenced (14, 16, 17), though outcomes vary. In our study, we used 90 cm $H_2O$ as a threshold and explored related influencing factors. Recent literature supports using individualized VLPP thresholds based on patient-specific contexts.

Urethral pressure profile (UPP) measurements are often normal in incontinent patients and tend to remain unchanged even after interventions such as periurethral bulking injections. Due to its simplicity and practicality, VLPP is generally favored over UPP for distinguishing anatomical SUI from ISD. UPP is considered unreliable in evaluating stress incontinence (18, 19). O'Connor reported that patients with VLPP >60 cm $H_2O$ had better outcomes, while those with VLPP ≤60 cm $H_2O$ had reduced success, likely due to ISD (20). However, the limited number of patients with low VLPP in our study precluded detailed statistical analysis on ISD.

Guerette et al. identified VLPP >60 cm $H_2O$ and maximum urethral closure pressure (MUCP) >40 cm $H_2O$ as strong predictors of surgical success (21). These findings underscore the value of preoperative urodynamics for outcome prediction in patients undergoing SUI surgery.

Another important consideration is the occurrence of de novo detrusor overactivity following surgery. In many cases, it is difficult to determine whether the condition existed preoperatively, complicating postoperative evaluation. The incidence of detrusor overactivity can reach up to 70% in women following unsuccessful incontinence surgery (22). There is consensus that patients with mixed incontinence, neurological conditions, or discordant symptoms and findings should undergo preoperative urodynamic evaluation.

Our findings support this recommendation. Although preoperative urge incontinence was not associated with UI severity or volume, postoperative urge incontinence was significantly linked to persistent UI, possibly due to new-onset detrusor overactivity. The presence of postoperative urge incontinence emerged as a key factor associated with increased UI frequency and volume—both of which were strongly correlated with surgical success. These results suggest that UI symptom burden in the postoperative period may serve as a valuable clinical indicator of treatment outcomes.

The type of incontinence—whether pure stress or mixed— also had a notable influence on surgical outcomes. Patients with mixed urinary incontinence, identified by the presence of urge symptoms preoperatively, demonstrated significantly worse postoperative results. These included higher rates of persistent UI and poorer outcomes on postoperative stress tests. In contrast, patients with pure stress incontinence achieved more favorable results. This pattern supports previous findings indicating that mixed incontinence, particularly when associated with detrusor overactivity, complicates treatment and may increase the likelihood of persistent or de novo symptoms following TOT surgery.

A limitation of our study is that many of the cited references assessed urodynamic parameters retrospectively. These studies were not specifically designed to predict outcomes, limiting the generalizability of their findings prospectively.

**CONCLUSION**

In evaluating the factors influencing the outcomes of TOT surgery for SUI, we found that patient age, BMI, number and mode of deliveries, POP-Q classification, and grade 1–2 cystoceles had no significant impact on surgical success.

Postoperative analysis of ICIQ-SF scores revealed significant improvements in both symptom severity and the impact of urinary incontinence on daily life, underscoring the clinical efficacy of the TOT procedure.

Patients with VLPP values below 90 cm $H_2O$ exhibited a higher incidence of postoperative urinary incontinence, suggesting a potential association with ISD.

Although preoperative urge incontinence did not significantly influence surgical outcomes, the emergence of de novo urge incontinence postoperatively was strongly associated with persistent UI symptoms. This finding may reflect the development of new-onset detrusor overactivity, highlighting the need for further research and careful postoperative evaluation.

**Conflict of Interest:** None.

**Informed Consent:** Informed consent was obtained from all participants prior to inclusion in the study.

**Ethical Approval:** The study was approved by the Non-Interventional Clinical Research Ethics Committee of Bağcılar Training and Research Hospital (Approval No: 2024/01/11/011, Date: 2024-01-24). The study was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

**Author Contributions:** Concept and Design: SY, IOC, AS, TD; Supervision: SG, AC, MMD; Data Collection and/or Analysis: SS, OKA, GC, AC; Analysis and/or Interpretation: SY, IOC, AS, SS; Literature Search: SY, TD, SS, OKA, GC, AC; Writing: SY, IOC; Critical Review: SY, IOC, AS, TD, MMD.

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