



Original Article

How Effective Is the Transobturator Tape (TOT-V) Procedure in the Management of Stress Urinary Incontinence in Low-Resource Settings? A Descriptive Study

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Abstract

Stress urinary incontinence (SUI) is a common gynaecological condition affecting both premenopausal and postmenopausal women, and although Burch colposuspension has traditionally been considered the gold standard for moderate to severe SUI, mid-urethral sling procedures such as the transobturator tape (TOT-V) remain widely used in low-resource settings due to their lower cost, technical simplicity, and favourable recovery profile. This study evaluated the clinical efficacy, safety, and patient-reported outcomes of the transobturator tape (TOT) procedure for stress urinary incontinence, with follow-up extending to two years, and demonstrated consistently high levels of patient satisfaction ranging from 81% to 85% across all time points, comparable to international success rates of 80–90%. Early postoperative outcomes were particularly favourable, with 85% of women reporting satisfaction at discharge, reflecting rapid symptomatic relief and the minimally invasive nature of the procedure, while medium- and long-term follow-up showed sustained benefit with only a modest decline in satisfaction by two years, consistent with published long-term data. Comparative analysis supports the advantages of TOT over retropubic tension-free vaginal tape, including reduced risks of bladder perforation, voiding dysfunction, and vascular injury, albeit with a higher incidence of transient groin pain, and demonstrates outcomes comparable to Burch colposuspension with lower morbidity, shorter operative time, and faster recovery—advantages that are especially relevant in low-resource settings. The complication profile was favourable and aligned with international evidence, with groin pain occurring in 17% of patients and resolving with conservative management, tape erosion observed in 2.4%, and a low recurrence rate of 4.7%, all within or below reported global ranges. The use of the Patient Global Impression of Improvement scale strengthened patient-centred assessment, confirming high subjective benefit that paralleled objective outcomes. Overall, these findings support the TOT procedure as a safe, effective, and well-tolerated surgical option for stress urinary incontinence, with durable outcomes and particular suitability for low- and middle-income settings due to its affordability, minimal resource requirements, and reliable clinical performance.

Keywords: Stress urinary incontinence, transobturator tape, mid-urethral sling, PGI-I scale

1. Introduction

Stress urinary incontinence (SUI) is defined as involuntary leakage of urine during exertional activities such as coughing, sneezing, or exercise and is one of the most prevalent urogynaecological conditions worldwide. Estimates suggest that 35–45% of adult women experience some degree of SUI

during their lifetime (1). The condition significantly affects psychosocial well-being, sexual life and quality of life (2). However, Data on stress urinary incontinence among postmenopausal women in Sri Lanka are limited (3).

SUI arises from pelvic floor support defects or intrinsic urethral sphincter deficiency. Risk factors



include childbirth trauma, menopause, obesity, chronic cough, and pelvic surgery (4). Surgical management is often required when conservative methods fail.

Traditional procedures such as Burch colposuspension provide success rates of 70–90% but require open or laparoscopic surgery, higher cost, longer operating times, and greater surgical expertise (5). The introduction of mid-urethral sling (MUS) procedures revolutionised treatment by offering minimally invasive techniques with rapid recovery and durable success.

Among MUS options, the transobturator tape (TOT) approach, described by Delorme in 2001 (6), avoids the retropubic space and reduces risks associated with the tension-free vaginal tape (TVT). Standardised follow-up data demonstrate good efficacy with fewer visceral complications than retropubic methods (7). However, controversies regarding mesh use in high-income countries have restricted MUS procedures (8). In contrast, TOT remains valuable in low-resource settings due to affordability, availability, and favourable safety profiles.

This study evaluates the outcomes of TOT-V using data from a Sri Lankan multicentre study and contextualises these findings within current global evidence.

2. Background

2.1 Pathophysiology of Stress Urinary Incontinence

SUI results from defective urethral support or compromised sphincteric function. During increased intra-abdominal pressure, an adequately supported urethra maintains closure pressure. Weakening of the endopelvic fascia, pelvic floor muscles, or pubourethral ligaments impairs this mechanism (5,10). Intrinsic sphincter deficiency further exacerbates leakage by reducing urethral closure pressure.

2.2 Evolution of Surgical Techniques

2.2.1 Burch Colposuspension

Developed in the 1960s, Burch colposuspension elevates the urethrovesical junction by suspending the paravaginal tissues to Cooper's ligament. Though effective, the technique requires significant operative expertise and is associated with longer recovery (11).

2.2.2 Mid-Urethral Sling Procedures

MUS procedures, including TVT and TOT, use polypropylene mesh to restore urethral support without tension. Advantages include minimal dissection, small incisions, shorter operative times, low cost, and rapid return to normal activity. The transobturator approach reduces bladder and bowel injury risks associated with retropubic needle passage (12).

3. Objectives

The study aimed to:

1. Assess the effectiveness of TOT-V as a treatment modality for SUI in low-resourced settings
2. Evaluate symptomatic improvement following TOT-V in women with SUI.
3. Assess patient satisfaction using the PGI-I scale.
4. Determine postoperative and long-term complications.

4. Methods

4.1 Study Design and Setting

This descriptive cross-sectional study was conducted over six years at, Castle Street Hospital for Women, Colombo, Sri Lanka; Colombo South Teaching Hospital, Kalubowila, Sri Lanka; Base Hospital Walasmulla, Hambanthota, Sri Lanka; Base Hospital Udugama, Galle, Sri Lanka

A total of 42 women who underwent primary TOT-V were included.



4.2 Data Collection

An interviewer-administered questionnaire captured demographic data, clinical history, perioperative outcomes, and PGI-I scores. Patients were assessed at pre-discharge, at six months, at one year, and at two years.

5. Results

5.1 Participant Characteristics

Table 1 shows most patients reported moderate to severe SUI preoperatively and 61.9% of them were postmenopausal.

Characteristic – Age Group	Number (n)	Percentage (%)
Premenopausal	16	38.1%
Postmenopausal	26	61.9%

Table 1. Demographic Characteristics of the Study Population (n = 42)

Patient Global Impression of Improvement (PGI-I) scale, a validated tool recommended by British Society of Urogynecology, is used to assess patient satisfaction.

4.3 Outcome Measures

Primary outcome:

- Subjective improvement of SUI symptoms measured using the PGI-I, a validated tool recommended by the British Society of Urogynecology.

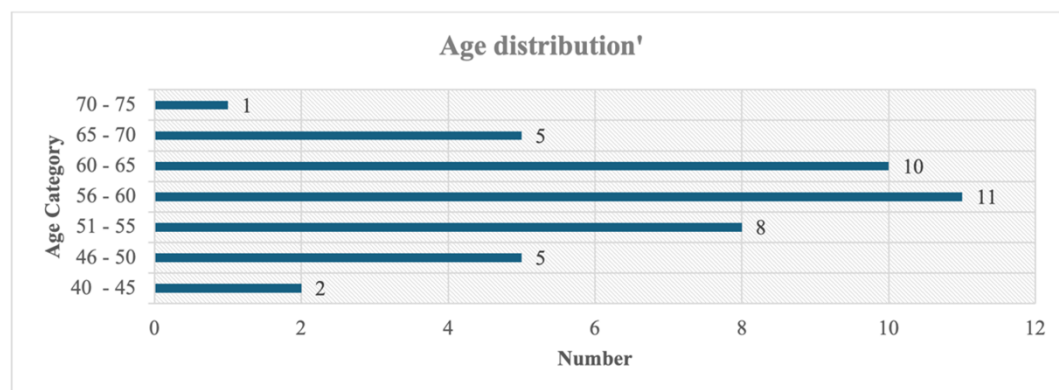
Secondary outcomes:

- Acute postoperative complications
- Long-term complications (erosion, recurrence)

As shown in graph 1, majority of the participants who presented with SUI belonged to age category of 56–60 years. 83% of the participants were more than 50 years. The age distribution indicates that the study population is predominantly composed of individuals aged 56–65 years, with meaningful representation across 51–70 years, and very few participants at the extreme age ranges.

5.2 Postoperative Outcomes

As shown in table 2, 85.7% patients (n=36) reported being “very much better” or “much better.” This indicates a high level of perceived benefit right at discharge, suggesting rapid symptom relief. 9.5% patients (n=4) rated themselves as “a little better.”



Graph 1. Age Distribution of the Study Population (n = 42)



Level of Patient's Satisfaction at Discharge	Number	Percentage
Very much better	27	64.3%
Much better	9	21.4%
A little better	4	9.5%
No change	2	4.8%
A little worse	0	0%
Much worse	0	0%
Very much worse	0	0%
Total	42	100%

Table 2. Immediate Postoperative Outcomes Based on PGI-I Scale - At Discharge

Level of Patient's Satisfaction at 6 months	Number	Percentage
Very much better	23	57.5%
Much better	10	25.0%
A little better	5	12.5%
No change	1	2.5%
A little worse	1	2.5%
Much worse	0	0%
Very much worse	0	0%
Total	40	100%

Table 3. Postoperative Outcomes Based on PGI-I Scale – at 6 Months

These patients experienced improvement, though less pronounced. The 4.8% reporting no change indicates only a small group who did not experience benefit at discharge.

As shown in table 3, 82.5% patients (n=33) reported being “very much better” or “much better.” This indicates a strong positive impact of the intervention for the majority. 12.5% patients (n=5) reported being “a little better.” This group experienced some improvement, though not to the same extent as the majority. Only 5% patients (n=2) had no improvement or worsening. This small percentage indicates low treatment failure or

dissatisfaction. Loss to follow-up was 2 participants by 6 months of postoperative period.

Table 4 shows total of 83.7% patients (n=31) reported a marked improvement, with 48.6% patients (n=18) stating they were “very much better” and a further 35.1% patients (n=13) reporting they were “much better”. This indicates that more than four-fifths of the cohort experienced substantial symptomatic benefit at one year. A smaller proportion of patients reported modest improvement, with 8.1% patients (n=3) indicating they were a “little better”. When combined with those reporting marked improvement, 91.8% patients (n=34) experienced some degree of clinical



Level of Patient's Satisfaction at 1 year	Number	Percentage
Very much better	18	48.6%
Much better	13	35.1%
A little better	3	8.1%
No change	2	5.4%
A little worse	1	2.7%
Much worse	0	0%
Very much worse	0	0%
Total	37	100%

Table 4. Postoperative Outcomes Based on PGI-I Scale – at 1 year

Level of Patient's Satisfaction at 2 years	Number	Percentage
Very much better	17	54.8%
Much better	8	25.8%
A little better	2	6.5%
No change	1	3.2%
A little worse	2	6.5%
Much worse	1	3.2%
Very much worse	0	0%
Total	31	100%

Table 5. Postoperative Outcomes Based on PGI-I Scale – at 2 years

benefit. Only 5.4% patients (n=2) reported no change in their symptoms at one year. Symptom deterioration was uncommon, with just 1 patient (2.7%) reporting being a “little worse”. Importantly, no patients reported being much worse or very much worse. Loss to follow-up was 5 participants by 1 year of postoperative period.

As shown in table 5, at two years, the majority of patients continued to report favorable outcomes. 54.8% patients (n=17) stated they were “very much better”, while a further 25.8% patients (n=8) reported being “much better”. Together, these findings indicate that 80.6% patients (n=25)

experienced a marked and sustained improvement at two years. A small proportion of patients reported modest benefit, with 6.5%2 patients (n=2) indicating they were a “little better”. Overall, some degree of improvement was therefore reported by 87.1% patients (n=27). Only one patient (3.2%) reported no change in symptoms. Symptom deterioration was reported by three patients (9.7%), with two patients (6.5%) stating they were a “little worse” and one patient (3.2%) reporting being “much worse”. No patients reported being “very much worse”. Loss to follow-up was 11 participants by 2 years of postoperative period.



Type	Complication	Before Discharge	At 6 months	at 1 year	at 2 years	Total
Perioperative	Urethral perforation	0	-	-		0
	Vaginal injury	0				0
Early postoperative	Bleeding	2				2
	Haematoma	0				0
	Groin pain	7				7
	UTI	0				0
	Urinary retention	1				1
	Infection	0				0
Late postoperative (After 3 months)	Tape erosions		0	0	1	1
	Urinary retention		0	0	0	0
	Recurrence of symptoms		1	1	0	2

Table 6. Peri-operative and Post-operative Complications Following TOT-V

Complication	Number (n)	Percentage (%)
Groin pain	7	17%
Surgical-site bleeding	2	4.7%
Urinary retention	1	2.4%
Infection	0	0%

Table 7. Early Postoperative Complications Following TOT-V

Outcome / Complication	Number (n)	Percentage (%)
Tape erosion	1	2.4%
Recurrence of SUI	2	4.7%

Table 8. Long-Term Outcomes and Complications (1–2 Year Follow-Up)

5.3 Complications

Table 6 shows that there were no significant perioperative complications reported.

5.3.1 Early Postoperative Complications

As shown in table 7, the perioperative and early postoperative complication rates were low. No cases of urethral perforation or vaginal injury were

recorded, indicating good intraoperative safety. Bleeding was observed in two patients before discharge, representing the most frequent immediate surgical complication, but no ongoing bleeding was reported at later follow-up points. No haematomas or postoperative infections were documented.



Groin pain was the most common early postoperative complaint, reported in 17% patients (n=7) before discharge. However, this symptom did not persist beyond the immediate postoperative period, suggesting that it was transient and self-limiting. Urinary retention occurred in one patient before discharge but resolved subsequently, with no further cases reported at later follow-up. Importantly, no urinary tract infections were recorded in the early postoperative period.

5.3.2 Late postoperative (After 3 months) complications

As shown in table 8, late complications were infrequent. Tape erosion was identified in one patient (2.4%) at the two-year follow-up, with no cases detected at 6 months or 1 year, indicating a low incidence of mesh-related complications over time. Late urinary retention was not observed at any follow-up interval.

Recurrence of symptoms was reported in 4.7% patients (n=2), with one case identified at 6 months and another at 1 year. No further recurrences were noted at two years, suggesting that symptom recurrence was uncommon and occurred relatively early in the follow-up period.

5.4 Long-Term Satisfaction

PGI-I scores at one and two years revealed sustained satisfaction among the majority. Only two patients reported deterioration of symptoms due to recurrence.

6. Discussion

6.1 Clinical Efficacy

The present study evaluated patient satisfaction following the transobturator tape (TOT) procedure for stress urinary incontinence, with follow-up extending up to two years. Our findings indicate consistently high levels of satisfaction, with overall rates ranging from 81% to 85% across different time

points, aligns with international studies reporting success rates of 80–90% (13).

Short-term Outcomes:

At discharge, 85% of patients reported satisfaction, with 64% experiencing a “very much better” outcome and 21% a “much better” outcome. This high early satisfaction likely reflects immediate symptomatic relief and the minimally invasive nature of the TOT procedure, consistent with rapid postoperative recovery reported in other studies.

Medium-term Outcomes:

At six months, overall satisfaction was slightly lower at 82%, with 57% reporting a “very much better” outcome and 25% a “much better” outcome. This decrease, though modest, may relate to the natural adjustment period following surgery, minor postoperative complications, or evolving patient expectations over time.

Long-term Outcomes:

One-year follow-up showed an increase in overall satisfaction to 84%, with 49% very much improved and 35% much improved, suggesting stabilization and consolidation of treatment effects. By two years, satisfaction slightly declined to 81% (very much better 55%, much better 26%), reflecting the chronic nature of urinary incontinence, potential recurrence, or late-onset complications in a small subset of patients.

Comparison with Other Studies:

Our findings align closely with existing literature. Many studies report patient satisfaction rates exceeding 85% following TOT procedures, underscoring its efficacy and favorable patient-perceived outcomes (14). Objective cure rates (“dry” outcomes) are similarly high, with some reports around 77% (15). This correlation between subjective satisfaction and objective outcomes highlights the clinical reliability of TOT in appropriately selected patients.



The TOT procedure demonstrates sustained high patient satisfaction, comparable to or slightly below other studies. The slight decline in satisfaction at the two-year mark is consistent with long-term follow-up in prior research and emphasizes the need for ongoing monitoring and management of recurrent or persistent symptoms. Moreover, our stratification of satisfaction into “very much better” and “much better” outcomes provides nuanced insight into patient-perceived improvements, complementing objective cure rates and reinforcing the value of patient-reported outcomes in evaluating surgical success.

Overall, the data support the TOT procedure as a safe, effective, and well-tolerated intervention for stress urinary incontinence, with durable satisfaction outcomes over at least a two-year follow-up. Future studies with larger cohorts and extended follow-up could further elucidate long-term trends and factors influencing patient satisfaction.

6.2 Comparison With Other Surgical Modalities

TOT vs TVT

Evidence indicates that TOT:

- reduces bladder perforation risk
- causes fewer voiding difficulties
- avoids retropubic vascular injury (16)

However, groin pain is more common with TOT.

TOT vs Burch Colposuspension

Randomised trials show comparable continence rates but lower morbidity and quicker recovery with MUS procedures (17). For low-resource settings, TOT offers significant practical advantages due to reduced operative time and cost.

6.3 Complications

The complication profile observed in the present study is consistent with international data, further supporting the safety and acceptability of the

transobturator tape (TOT) procedure for stress urinary incontinence.

Groin Pain

Groin pain was reported in 17% of patients in this study, a figure that lies well within the globally reported range of 10–20% (18). This complication is well recognised following the transobturator approach and is thought to result from obturator nerve irritation or muscular trauma during tape placement. Importantly, in line with published literature, groin pain in our cohort was transient and responded well to conservative management, with no long-term functional impairment reported. The absence of persistent or disabling pain reinforces the favourable risk–benefit profile of the TOT technique.

Tape Erosion

The incidence of tape erosion in the present study was 2.4%, closely mirroring rates reported in large series and systematic reviews, which range between 1% and 3% (19). This finding underscores appropriate surgical technique and postoperative care. Recognised risk factors for tape erosion include postmenopausal vaginal atrophy, impaired wound healing, infection, and excessive tension on the tape. Given the demographic profile of women undergoing surgery for stress urinary incontinence, particularly in postmenopausal populations, careful patient selection, preoperative optimisation of vaginal health, and meticulous surgical technique remain critical in minimising this complication.

Recurrence

Recurrence of stress urinary incontinence following TOT surgery has been reported in 5–20% of cases in the literature (20). The recurrence rate of 4.7% observed in this study is therefore favourable and suggests good medium- to long-term efficacy. This lower recurrence rate may reflect appropriate patient selection, accurate surgical placement, and adherence to standardized operative protocols. Nevertheless, recurrence remains a recognised long-



term concern, influenced by factors such as ageing, progression of pelvic floor weakness, obesity, and chronic increases in intra-abdominal pressure.

Overall Assessment

Taken together, the complication rates in this study are comparable to, or better than, those reported internationally. The findings demonstrate that the TOT procedure is associated with predominantly minor, manageable complications and a low rate of significant adverse outcomes. These results further support the role of TOT as a safe and effective surgical option for stress urinary incontinence when performed with appropriate technique and patient counselling.

6.4 Patient-Reported Outcomes

Use of the PGI-I instrument strengthens the patient-centred evaluation. High satisfaction levels reinforce the clinical success of the TOT-V procedure.

6.5 Relevance to Low-Resource Settings

TOT-V's affordability, minimal equipment requirement, and clinical effectiveness make it particularly suitable for LMICs. Given increasing restrictions on synthetic mesh in high-income regions, access-driven, context-appropriate use remains crucial.

7. Limitations of current study

- Small sample size
- No comparison group
- Limited follow-up beyond two years
- Potential interviewer bias

Further large-scale, prospective studies are needed.

8. Conclusion

This study demonstrates a high level of patient satisfaction following the transobturator tape (TOT-V) procedure, confirming its continued effectiveness in the management of stress urinary incontinence,

particularly in low-resource settings. Optimal outcomes were achieved through appropriate preoperative assessment, careful patient selection, and sound surgical technique. Early postoperative complications were predominantly minor and included groin pain and bleeding from the surgical site. Late complications, such as recurrence of urinary incontinence and tape erosion, were infrequent, supporting the safety and durability of the TOT-V procedure. TOT-V is a safe, effective, and cost-efficient option for the management of stress urinary incontinence, particularly in low-resource settings.

9. Recommendations

1. TOT-V can be considered a first-line surgical option for SUI in resource-limited centres.
2. Postoperative follow-up protocols must be standardised to monitor complications early.
3. Training programmes should focus on surgical technique and complication management.
4. Future research should include randomised trials comparing TOT with alternative techniques.
5. Patient counselling on risks, benefits, and expectations should be standard practice.

10. Disclosure of interests - No conflicts of interest



11. How to cite this article

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