

Long term outcomes of Burch colposuspension and transobturator tape and single incision needleless (DynaMesh®- SIS minor) for the surgical treatment of female stress urinary incontinence patients who underwent combined pelvic reconstructive surgery or hysterectomy

Yesim Akdemir (✉ yesimakdemir@yahoo.com)

Zonguldak Bulent Ecevit Universitesi Tip Fakultesi <https://orcid.org/0000-0002-8574-5065>

Fadime Dincer

Zonguldak Bulent Ecevit Universitesi Tip Fakultesi

Cagatay Buyukuysal

Zonguldak Bulent Ecevit Universitesi Tip Fakultesi

Ulku Ozmen

Zonguldak Bulent Ecevit Universitesi Tip Fakultesi

Muge Harma

Zonguldak Bulent Ecevit Universitesi Tip Fakultesi

Mehmet Ibrahim Harma

Zonguldak Bulent Ecevit Universitesi Tip Fakultesi

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Abstract

Background

Women with SUI often require combined pelvic reconstructive surgery because of sharing risk factors of pelvic relaxation. The aim of this study was to evaluate the efficacy of Burch colposuspension, the transobturator tape (TOT), and single incision needleless (DynaMesh®- SIS minor) procedures in patients with SUI who also underwent combined pelvic reconstructive surgery or hysterectomy.

Methods

We carried out a prospective cohort study that included 142 patients who underwent Burch colposuspension (n:43), TOT(n:40), or SIS(n:39) procedures combined pelvic reconstructive surgery or hysterectomy between January 2010 and July 2018. During clinical follow-up, objective cure, subjective cure, failure and surgical success rates were analyzed. Quality of life and symptom severity were assessed by IIQ-7, UDI-6, OAB-V8, SSI, SSQ-8 and PGI-I. Primary outcome was surgical success which was defined when any of the objective cure, subjective cure or improvement has achieved and secondary outcomes were; intraoperative bladder injury, sling extrusion, de novo urgency, voiding dysfunction, length of hospital stay, and outcomes of patient reported quality of life questionnaires.

Results

Surgical success rate were higher in Burch group than SIS group and also higher in TOT group than SIS group (88,4% vs 61,5% and 87,5% vs 61,5% respectively, $p=0,003$) Urinary incontinence complaints were higher and quality of life were lower in in SIS group when compared with Burch group. No difference was seen in between Burch and TOT groups, and TOT and SIS groups in terms of IIQ-7, UDI-6, OAB-V8, SSI, and SSQ-8 scores.

Conclusions

Both Burch and TOT were safe and effective procedures in patients with SUI who required additional pelvic surgeries. Although surgical outcome of SIS procedure in SUI patients that had concomitant pelvic surgeries in our study was not promising, the data are not clear and further randomized studies are needed to clarify these observations.

Background

Stress urinary incontinence (SUI) is the leakage of urine when intra-abdominal pressure increases (frequently with coughing, laughing or sneezing) and the prevalence of SUI is 46% in women of reproductive age in Turkey (1). Women with SUI often require combined pelvic reconstructive surgery because of sharing risk factors of pelvic relaxation like obesity, pregnancy, and childbirth, or require hysterectomy for other gynecological pathologies.

Before Ulmsten and Petros (2) presented the tension free vaginal tape (TVT) procedure in 1995, and consecutively Delorme (3) practiced the transobturator tape (TOT) (outside-in) procedure in 2001, Burch colposuspension was considered the gold standard surgical treatment. Several observational and randomized studies have showed similar efficacy and lower morbidity for mid-urethral sling (MUS) operations compared with Burch colposuspension (4–7). However Burch colposuspension is still a frequently performed and effective operation for SUI especially when concomitant pelvic surgery is needed.

While being rare, bladder, vaginal, urethral, and vascular perforations or erosions, and groin pain reported after MUS procedures (8). To minimize these risks, single incision slings (SIS) that avoids retropubic or obturator space entry, have developed in 2006 (9). Despite potential advantages of SIS, reported cure rate ranges from 48–88% in 2–5 years follow-up (10–15).

The aim of this study was to evaluate the efficacy of Burch colposuspension, TOT, and SIS (DynaMesh®-SIS minor) procedures in patients with SUI who also underwent combined pelvic reconstructive surgery or hysterectomy.

Materials And Methods

This was a prospective cohort study that evaluated women with SUI or stress predominant mixed urinary incontinence who underwent Burch colposuspension, TOT, or SIS procedures combined pelvic reconstructive surgery or hysterectomy between January 2010 and July 2018 in the Gynecology Clinic at Zonguldak Bulent Ecevit University, School of Medicine.

Inclusion criteria were; presence of clinically proven SUI by stress test, failed medical treatment or pelvic floor training, and postoperative follow-up duration 12 months or more. Exclusion criteria were: history of incontinence surgery, presence of urge predominant mixed incontinence, and chronic systemic disease such as neuropathy or history of urogenital cancer. Clinical history was taken, pelvic examination and POP-Q staging was done, and other gynecological pathologies were identified. Preoperative urodynamic studies were not routinely performed and SUI was diagnosed by identifying positive stress test with filled bladder.

The patients who had diagnosis of abnormal uterine bleeding, uterine leiomyoma or pelvic relaxation underwent surgeries as total abdominal hysterectomy (TAH), vaginal hysterectomy (VH), anterior colporrhaphy (AC), posterior colporrhaphy (PC), rectus fascia colpopexy (RFC), and or unilateral sacrospinous ligament fixation (SSF). At the end of these procedures Burch colposuspension, TOT or SIS was performed. All procedures were performed by three senior surgeons.

The Burch colposuspension was performed as originally described by placing bilateral two sutures between ipsilateral iliopectineal ligaments and vaginal wall at the levels of mid-urethra and urethrovaginal junction (16). The TOT procedure was performed according to Delorme (3) which is an outside to inside method. SIS procedure was performed by using DynaMesh®-SIS minor which is a non-absorbable,

fluoropolymer, polyvinylidene fluoride (PVDF) sling (17). After sharp bilateral paraurethral dissection was done until bilateral pubic rami, DynaMesh®- SIS minor was attached by self-attaching surface without any additional fixation device. Cystoscopy was performed after all Burch colposuspension procedures. A Foley catheter was placed and removed after 24 hours unless an AC procedure was performed. Post-void urine volume was measured and patient was discharged if residue was \leq 100 ml.

The patients were evaluated at 1, 6, 12 months and annually after. Stress test, Q-tip test, detailed urogynecological examination including groin and anterior vaginal mucosa for possible sling exposure, and POP-Q staging were carried out. Any symptom relevant with the procedures and outcomes of patient reported Turkish language validated versions of Incontinence Impact Questionnaire (IIQ-7) (18) and Urogenital Distress Inventory (UDI-6) (18), Sandvik Severity Index (SSI) (19), Surgical Satisfaction Questionnaire (SSQ-8) (20), Overactive Bladder Questionnaire V8 (OAB-V8) (21), and Patient Global Impression of Improvement (PGI-I) Scale (22) were recorded. Objective cure of SUI was defined as the negative stress test in the lithotomy position with a full bladder and patient reported continence. Subjective cure of SUI was defined as positive stress test but patient reported continence. Improvement was assessed with Patient Global Impression of Improvement (PGI-I) Scale and defined when answers were a little better, much better, and very much better (22). Failure was defined as presence of positive stress test and patient reported incontinence, persisted or recurrent SUI after surgery. At last, surgical success was defined when any of the objective cure, subjective cure or improvement has achieved.

Secondary outcomes were; intraoperative bladder injury, sling extrusion, de novo urgency, voiding dysfunction, length of hospital stay, and outcomes of patient reported quality of life questionnaires.

Statistical analysis

SPSS 19.0 was used for statistical analysis. Continuous values were presented with mean, standard deviation, median, minimum and maximum values, where categorical variables were presented with frequency and percent. Shapiro Wilk test were used for test of normality. Independent samples t-test or Mann Whitney U test were used for variables normal distribute or not. Yates and Fisher exact Chi-Square tests were used for comparison of categorical variables among groups. All statistical comparisons with a p value below 0,05 were assumed as statistically significant.

Ethics statement

An ethics committee report was obtained from the School of Medicine, Zonguldak Bulent Ecevit University. Informed consent was obtained from all individual participants for whom identifying information is included in this article.

Results

We evaluated 43 women in the Burch group, 40 women in the TOT group, and 39 women in the SIS group. The mean follow-up were 20.97 ± 12.72 , 32.05 ± 19.5 , and 13.69 ± 4.48 months in the Burch, TOT, and SIS

groups respectively. No significant differences were found between the groups in terms of age, body mass index, parity, number of vaginal deliveries, menopausal status, comorbidities (hypertension and diabetes mellitus, chronic obstructive pulmonary disease), and smoking (Table 1). Types of urinary incontinence were similar between the groups. Stress predominant mixed urinary incontinence was the most common type of incontinence in both groups (67,4%, 80%, 84,6% in the Burch, TOT, and SIS groups respectively). The most performed concomitant procedure was TAH (90,9%) in the Burch group, AC (34,28%) in the TOT group, and AC (45,45%) in the SIS group (Table 1).

Table 1
Demographic and clinical parameters of patients.

	Burch (n:43)	TOT (n:40)	SIS (n:39)	p value^l
Duration of follow-up(mo) ^x	20,97 ± 12,72	32,05 ± 19,55	13,69 ± 4,48	< 0,001 ²
Age ^x	50,76 ± 10,86	52,05 ± 9,57	52,38 ± 8,48	0,845
BMI ^{a, x}	32,65 ± 8,01	31,13 ± 5,03	30,36 ± 4,48	0,418
Parity ^x	2,69 ± 1,05	3,35 ± 1,51	3,38 ± 1,61	0,149
Vaginal delivery ^x	2,97 ± 1,27	3,17 ± 1,70	3,30 ± 1,70	0,062
Menopausal status n(%)	20 (46,5)	21 (52,5)	18 (46,2)	0,815
Comorbidities n(%)	15 (39,4)	19 (47,5)	20 (51,3)	0,289
HT ^b	5 (11,6)	10 (25)	3 (7,7)	0,074
DM ^c	0 (0)	3 (7,5)	3 (7,7)	0,068
COPD ^d				
Smoking n(%)	7 (16,8)	7 (17,5)	12 (30,8)	0,215
Urinary incontinence type n(%)	14 (32,6)	8 (20)	6 (15,4)	0,157
SUI ^e	29 (67,4)	32 (80)	33 (84,6)	
Mixt				
Concomitant procedure n(%)	40 (90,9)	3 (8,57)	1 (3,03)	
TAH ^f	0	10 (28,57)	7 (21,21)	
VH ^g	0	12 (34,28)	15 (45,45)	
AC ^h	0	6 (17,4)	9 (27,27)	
PC ⁱ	4 (9,09)	0 (0)	1 (3,03)	
RFC ^j	0(0)	4 (11,42)	0 (0)	
SSF ^k				
^x Data presented as mean ± SD				
^a body mass index, ^b hypertension, ^c diabetes mellitus, ^d chronic obstructive pulmonary disease, ^e stress urinary incontinence, ^f total abdominal hysterectomy, ^g vaginal hysterectomy, ^h anterior colporrhaphy, ⁱ posterior colporrhaphy, ^j rectus fascia colpopexy, ^k sacrospinous ligament fixation				
^l Chi-square test, ² p value for each double comparisons				

No pelvic hematoma, urinary retention or recurrent urinary infection was seen after any of the procedures. Complications were demonstrated in Table 2. Sling extrusion was higher in SIS group than in TOT group [6 cases (15,4%) vs 2 cases (5,15%) p:0,008]. The two cases in TOT group were continent and referred for dyspareunia in second and tenth postoperative months. Sling was trimmed locally with local anesthesia

and no other interventions were required in both cases and patients remained continent during follow-up. Three of the six cases in the SIS group referred in the first 6 months with incontinence and vaginal discomfort. Sling extrusion was identified at after six postoperative months during follow-up in other three cases that were continent. Bladder injury, voiding dysfunction, and de novo urgency rates (no de novo urgency was seen after SIS procedures) were similar between groups. Length of hospital stay were significantly higher in Burch group than in TOT and SIS groups ($3,06 \pm 2,58$ vs $2,20 \pm 2,26$ vs $1,92 \pm 1,56$ in Burch, TOT and SIS groups respectively).

Table 2
Intraoperative and postoperative complications during follow up.

	Burch (n:43)	TOT (n:40)	SIS (n:39)	p value^a
Mesh extrusion n(%)	0 (0)	2 (5,1)	6 (15,4)	0,008 ¹
Bladder injury n(%)	1 (2,3)	1 (2,5)	0 (0)	0,459
De novo urgency n(%)	3 (7)	2 (5)	0 (0)	0,129
Voiding dysfunction	9 (21,4)	9 (22,5)	9 (23,1)	0,984
Hospital stay length (days) *	$3,06 \pm 2,58$	$2,20 \pm 2,26$	$1,92 \pm 1,56$	$< 0,001^2$
^a Chi-square test. * Data presented as mean \pm SD.				
¹ p value for comparison between TOT and SIS.				
² p value for comparisons between Burch and SIS, and between Burch and TOT.				

The objective cure rates were higher in Burch group than in SIS group and also higher in TOT group than SIS group (53,5% vs 30,85% and 65% vs 30,85% respectively, $p:0,008$) (Table 3). The subjective cure rates and the improvement rates were similar between groups. The failure rates were lower in Burch group than in SIS group and also lower in TOT group than SIS group (11,6% vs 38,5% and 12,5% vs 38,5% respectively, $p: 0,003$). Surgical success rate were higher in Burch group than in SIS group and also higher in TOT group than SIS group (88,4% vs 61,5% and 87,5% vs 61,5% respectively, $p:0,003$). There were no statistical significance between Burch and TOT groups in terms of objective cure, subjective cure, improvement, failure, and surgical success rates.

Table 3
Surgical and patient reported outcomes.

	Burch (n:43)	TOT (n:40)	SIS (n:39)	p value^a
Objective cure n(%)	23 (53,5)	26 (65)	12 (30,8)	0,008 ¹
Subjective cure n(%)	6 (14)	5 (12,5)	6 (15,4)	0,934
Improvement n(%)	9 (20,9)	4 (10)	6 (15,4)	0,390
Failure n(%)	5 (11,6)	5 (12,5)	15 (38,5)	0,003 ¹
Surgical success n(%)	38 (88,4)	35 (87,5)	24 (61,5)	0,003 ¹
OAB n(%)	20 (47,6)	28 (70)	33 (84,6)	0,002 ²
IIQ-7 ^x	24,49 ± 28,41	34,14 ± 32,59	48,57 ± 32,41	0,002 ²
UDI-6 ^x	26,32 ± 23,21	33,83 ± 25,33	45,98 ± 28,65	0,005 ²
OAB-V8 ^x	10,90 ± 9,32	15,25 ± 11,13	19,69 ± 11,25	0,001 ²
SSI ^x	3,90 ± 3,95	5,17 ± 4,84	7,38 ± 4,41	0,002 ²
SSQ-8 ^x	82,58 ± 24,71	78,15 ± 19,75	65,13 ± 24,80	0,01 ²
PGI-I ^x	2,14 ± 1,04	2,40 ± 1,46	3,30 ± 1,00	< 0,001 ¹
	Surgical Success (n:97)	Failure (n: 25)	p value^a	
IIQ-7 ^x	31,03 ± 31,03	53,27 ± 32,50	0,001	
UDI-6 ^x	30,65 ± 24,74	53,19 ± 27,76	< 0,001	
OAB-V8 ^x	13,29 ± 10,28	22,75 ± 11,21	< 0,001	
SSI ^x	4,28 ± 4,10	10,16 ± 3,39	< 0,001	
SSQ-8 ^x	81,60 ± 20,72	50,95 ± 21,85	< 0,001	

^x Data presented as mean ± SD

^aChi-square test.

¹ p value for comparisons between Burch and SIS, and between TOT and SIS, ²p value for comparisons between Burch and SIS.

	Burch (n:43)	TOT (n:40)	SIS (n:39)	p value^a
PGI-I ^x	2,17 ± 0,94	4,33 ± 0,96	< 0,001	
^x Data presented as mean ± SD				
^a Chi-square test.				
¹ p value for comparisons between Burch and SIS, and between TOT and SIS, ² p value for comparisons between Burch and SIS.				

Urinary incontinence complaints were higher and quality of life were lower in in SIS group when compared with Burch group. IIQ-7, UDI-6, OAB-V8, and SSI scores were significantly higher in SIS group than in Burch group (Table 3). SSQ-8 scores which positively related with surgical satisfaction were higher in Burch group than in SIS group (82,58 ± 24,71 vs 65,13 ± 24,80, p:0,01). There were no difference in between Burch and TOT groups, and TOT and SIS groups in terms of IIQ-7, UDI-6, OAB-V8, SSI, and SSQ-8 scores.

On the other hand, PGI-I scores which were negatively related with cure and improvement, were higher in SIS group than Burch group and also were higher in SIS group than TOT group. No difference were seen between Burch and TOT groups in terms of PGI-I scores (Table 3).

We investigated persistent urgency with OAB-V8 and postoperative overactive bladder diagnosed as OAB-V8 scores higher than 12 (21). Although we could not classified persistent urgency as de novo urgency, we found postoperative overactive bladder rate were lower in Burch group than SIS group (47,6% vs 84,6%, p:0,002) even similar preoperative stress predominant mixt incontinence rates were existed in all groups.

To clarify the relation between surgical success and overactive bladder or stress urinary incontinence symptoms and quality of life, we further compared the patients with surgical success and patients with failure (Table 4). Not surprisingly, IIQ-7, UDI-6, OAB-V8, SSI, PGI-I scores were significantly lower and SSQ-8 scores were higher in patients with surgical success.

Table 4 Comparison of quality of life and urinary incontinence in patients with surgical success and failure.

	Surgical Success (n:97)	Failure (n: 25)	p value^a
IIQ-7^x	31,03 ± 31,03	53,27 ± 32,50	0,001
UDI-6^x	30,65 ± 24,74	53,19 ± 27,76	<0,001
OAB-V8^x	13,29 ± 10,28	22,75 ± 11,21	<0,001
SSI^x	4,28 ± 4,10	10,16 ± 3,39	<0,001
SSQ-8^x	81,60 ± 20,72	50,95 ± 21,85	<0,001
PGI-I^x	2,17 ± 0,94	4,33 ± 0,96	<0,001

^x Data presented as mean ± SD

^aChi-square test.

Discussion

Because of the common etiology, it is not surprising that almost half of the women with SUI underwent additional pelvic surgeries with incontinence surgeries (23, 24). Nevertheless, there is currently no consensus regarding surgical treatment of SUI in patients who require concomitant surgical procedures for pelvic relaxation or benign uterine pathologies. In this series, we found that 88,4%, 87,5%, 61,5% of women with SUI that had concurrent pelvic reconstructive surgery or hysterectomy got benefit from Burch colposuspension, TOT, and DynaMesh®- SIS minor mini-sling respectively.

Mellier et al. found that the cure rate which was considered as the complete absence of incontinence which obtained by UDI-6 and IIQ-7 at 17 months median were 73% in patients had TOT (Monarch®) alone and 57% in patients had TOT and other surgeries including VH, AC, PC and vaginal vault suspension (25). They reported that sling extrusions and infections rates were similar in both groups but severe voiding dysfunction was occurred only in TOT only group and TOT procedure could be safely applied with concomitant vaginal procedures (25). In the case series of Lo, 51 patients who had advanced genital prolapse and SUI treated with TOT (Monarch®) and vaginal genital reconstructive surgery and 86% of the patients were cured of incontinence at 12 months (26). In similar, we found surgical success of TOT procedure was 87,5% at 28 months median in our study.

Burch colposuspension is an effective incontinence procedure especially abdominal route will be used for hysterectomy. However, Moon et al. compared the efficacy of Burch colposuspension and TOT in patients who had concomitant abdominal hysterectomy and abdominal sacrocolpopexy (ASC) and found that the cure rate was significantly higher in patients after TOT with ASC than Burch colposuspension with ASC (69% and 98% respectively) (27). The authors speculated that extensive traction on bladder neck made by

ASC mesh and Burch colposuspension could be the reason of the failures and de novo urgency. On the other hand, little or no effect of Burch colposuspension on postoperative failures, de novo overactive bladder or voiding dysfunction was demonstrated in a recent Cochrane review (28). In our series, 4 of 43 patients underwent Burch colposuspension for SUI with RFC for vault suspension and surgical success was obtained 3 of the 4 patients at 16 months which was coherent with Burch colposuspension group surgical success rate.

Although SIS procedure could be performed with concomitant pelvic reconstructive surgery, data is scarce. Most of the studies that reported SIS results in patients with SUI, excluded the patients with genital prolapse (13, 15, 29). Fernandez-Gonzalez et al. included patients with genital prolapse to their study which compared SIS (Contasure needless®) with TOT (Monarch®) in treatment of SUI and found Contasure needless® was not inferior to Monarch® (12). However, analysis of the surgical outcomes of the patients with genital prolapse as a subgroup was not done separately. We performed SIS procedure with DynaMesh®-minor after completion of reconstructive surgery and to our knowledge this is the first study that reported the surgical outcomes of SIS and also compares three different procedures to treat SUI in patients that had concomitant pelvic surgeries.

Most of the early studies revealed SIS (TVT Secur® was the largest sample) procedure had higher incontinence rate, higher chance of requiring repeat incontinence surgery than TOT procedure (30, 31). Because of these medicolegal issues and inferior results of early trials many SIS were withdrawn from the market. Nevertheless, SUI procedures with newer SIS are promising. A randomized controlled study that compared SIS (Contasure-needleless®) versus TOT (Contasure-KIM®) found both procedures were comparable in terms of the objective, subjective cure and failure rates (13). Sivaslioglu et al. demonstrated better results in urodynamically proven SUI patients with Tissue Fixation mini-sling procedure than with TOT procedure in their randomized trial (14). Yildiz et al. reported high success rates with objective cure rate was 83% and failure rate was 9.8% at three years for Ophira mini-sling system (29). Also Gambini-Ricapa et al. published high urodynamically proven cure rate after Endopelvic free anchor minisling procedures at long follow-up and suggested that the success of the mini-sling technique was due to retropubic insertion route of sling to endopelvic fascia and pelvic diaphragm (15).

On the contrary of above studies, we found inferior objective cure and surgical success rates and higher failure rate in SIS (DynaMesh®- SIS minor) group than both Burch and TOT groups in our study. Inferiority was not seen between Burch and TOT groups. However, interpretation of results of our study must be made cautiously. First, the material of the SIS that we used was PVDF which is a non-absorbable, fluoropolymer monofilament, was different from the studies above (most commonly polypropylene). Little data exists in literature about PVDF slings that used in urinary incontinence procedures. While Padilla-Fernandez et al. reported less tolerance and less success rates of PVDF slings in TOT procedures (32), Sabadell et al. demonstrated similar efficacy and safety of PVDF slings with polypropylene slings (33). Currently, there are no studies that compare PVDF with polypropylene SIS. Second, Nambiar et al. concluded that the fixation mechanism of SIS was very important and poor performance of the withdrawn SIS might due to lack of specific fixation systems (31). DynaMesh®- SIS

minor is a short sling that has self-attaching surface and was used without need of any additional fixation device. Third, The Independent Medicines and Medical Devices Safety Review that published at December 2018 included the announcement of FEG Textiltechnik that DynaMesh®-SIS minor would be removed from the market worldwide in the near future and the reason to remove the product was not affected by an undesired clinical results and would not be carried out under the scope of a Field Safety Corrective Action (34). This action of FEG Textiltechnik will limit the further comparative studies.

Recently National Institute for Health Research of UK published ESTHER systematic review to evaluate the clinical effectiveness, safety, and cost effectiveness of surgical treatments of SUI (35). In that study the cure rates at 12 months were 89.1% for TVT, 76.7% for Burch colposuspension, 64.1% for TOT, and 39.8% for SIS. Need for repeat surgery was higher in TOT when compared with TVT (18,3% vs 0.5%) and also were higher in SIS when compared with TOT (5.1% vs 2.9%). Although there was considerable uncertainty around the estimate of effect, voiding difficulties were higher in Burch colposuspension when compared with TOT (OR 1.96) and higher in TOT when compared with SIS (OR between 0.34–0.93). In the comparison of sling extrusion rate, similar results were obtained in short term between SIS and TOT (4.8% vs 3.7%) but long term results favored TOT again with uncertainty (OR 2.43–5.02). Results of our study also showed that the sling extrusion was higher in SIS group than in TOT group at long term but voiding dysfunction rate was similar between three groups.

Another conflicting issue is the uncertainty about the optimum predictor of successful treatment. Despite the ease of assessment and objectivity of negative stress test, patient's subjective impressions regarding cure and improvement might be more important. According to this, some studies used only validated questionnaires or women's self-report to assess cure (25, 35). Majority of studies demonstrated both women's subjective cure and improvement by quality of life questionnaires or simply examined satisfaction rate and objective cure by negative stress test (4, 12–15, 29, 36–38). On the other hand, Lo preferred to report only objective cure rate and results of urodynamic investigations (26). To our opinion, patient's subjective impression of cure and improvement, objective cure that defines negative stress test and patient's quality of life assessments with validated questionnaires are both important and should be evaluated together.

Furthermore, worsening of urge symptoms or persistent urgency might deteriorate patient's quality of life even they had objectively cured. Domingo et al. concluded that mixed incontinence was not improved which assessed by quality of life questionnaires after TOT procedure and the main reason was patient's worsening urge symptoms (36). Likewise we found that OAB-V8 scores were lower in patients with surgical success than in patients with failure and the rate of overactive bladder after surgery was higher in SIS group which also associated with the lowest surgical success rate.

The strengths of our study were as follows: we compared Burch colposuspension, TOT, and SIS procedures to treat SUI in patients that had concomitant pelvic surgeries in first-time; follow-up periods were relatively long; we used validated questionnaires to evaluate patient's quality of life and also determined all objective and subjective cure, improvement, failure, and surgical success rates.

Despite the insights that the present study provided, it had limitations; we did not obtain quality of life assessments prior to surgery; the study group includes all patients with pure SUI or stress predominant mixed urinary incontinence and this might produce bias while evaluating patient's quality of life in aspect of urgency symptoms; the concomitant pelvic surgeries were in a wide spectrum; we could not perform urodynamic studies so we could not exclude patients with intrinsic sphincter deficiency which could be a possible bias.

Conclusions

In conclusion, we found that Burch colposuspension and TOT procedures were more efficacious than SIS (DynaMesh®- SIS minor) procedure in patients with SUI who also underwent combined pelvic reconstructive surgery or hysterectomy. Quality of life scores were also higher in patients who underwent Burch colposuspension or TOT procedures than in patients who underwent SIS (DynaMesh®- SIS minor) procedure. Considering the results of this study, both Burch and TOT were safe and effective procedures in patients with SUI who required additional pelvic surgeries and either could be applied by selecting the route of surgery. Although surgical outcome of SIS (DynaMesh®- SIS minor) procedure in SUI patients that had concomitant pelvic surgeries in our study was not promising, the data are not clear and further randomized studies are needed to clarify these observations.

Disclosure Statement

The authors declare that there is no conflict of interest associated with this manuscript.

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