

Surgeon preference for surgical treatment of stress urinary incontinence among urogynecologic surgeons, comparison after 15 years

GHAZALEH ROSTAMINIA¹, STEPHANIE PICKETT³, MICHAEL MACHIORLATTI²,
S ABBAS SHOBEIRI¹, MIKIO NIHIRA³

¹ Inova Fairfax Hospital - Ob&Gyn Department

² The University of Oklahoma Health Sciences Center, Biostatistics Department

³ The University of Oklahoma Health Sciences Center, FPMRS Department

Abstract: Innovation in the treatment of stress urinary incontinence (SUI) in the last twenty years has changed practice patterns. The aim of our study was to compare surgeons' preference for surgical treatment for SUI between two surveys collected from American Urogynecologic Society's (AUGS) administered fifteen years apart. This was a cross-sectional study performed at the AUGS annual meeting in 1998 and 2013. Paper survey consisting of nineteen questions was self-administered to all participants at the annual meeting. Simple descriptive and inferential statistics were performed as well as appropriate tests of difference. Database of 136 responders in 1998 and 137 responders in 2013 were available for analysis. Female responders in 1998 and 2013 were 46% and 56%, respectively. The reportedly preferred procedure for treatment of SUI in 1998 was transabdominal retropubic urethropexy consisting of 67.5% of all surgeries performed for SUI. In 2013, the mid-urethral synthetic sling was reported as the most preferred of all surgeries for SUI (89%). Interestingly, open retropubic urethropexy was the preferred surgical approach for primary SUI in 1998 regardless of planned vaginal or abdominal concomitant procedures. In 2013, mid-urethral sling was reportedly the most preferred procedure regardless of need for concomitant surgeries. From 1998 until 2013, there were notable changes in the reported surgical management of stress urinary incontinence. Documentation of this transformation holds important implications as new technologies are constantly introduced and practice patterns continue to evolve. Consideration of these changes in practices should inform curricular development for surgical training.

Keywords: Stress urinary incontinence; Surgeon; Survey.

INTRODUCTION

Surgical treatment is the standard approach for women with stress urinary incontinence (SUI) who have failed conservative management strategies such as lifestyle change, physical therapy, scheduled voiding regimens, behavioral therapy, and pessary.¹ Although many surgical procedures have been reported, the ideal surgical technique would be a procedure that is simple, inexpensive, easy to learn and perform, minimally invasive, with durable efficacy, and without long term morbidity.² SUI treatment surgeries traditionally consisted of retropubic urethropexy or pubovaginal sling.³ Since 1996, when Ulmsten *et al.* published the initial paper about retropubic tension free vaginal tape (TVT), the use of synthetic mid-urethral slings (MUS) has grown to become the most common surgery performed for SUI women.⁴⁻⁶

There are seven major types of corrective procedures that have been described for SUI; suburethral fascial plication in anterior colporrhaphy, artificial sphincter, periurethral bulking agent injection, pubovaginal sling procedures (employing a biologic graft and anchored either directly to or above the rectus fascia), transabdominal retropubic urethropexy, transvaginal (needle) retropubic urethropexy, and mid-urethral synthetic sling.

Comparison of the efficacy and safety of these different surgical methods for the treatment of SUI in women exist in the literature, including some randomized control trials.⁷⁻⁸ In addition, there are a large number of nonrandomized trials of SUI surgery that are often retrospective case series, with short and medium term follow up using outcome parameters.⁹⁻¹³ Many of these studies researched the efficacy and safety of each procedure in different case scenarios, like concomitant abdominal or vaginal surgeries based on patients' outcome. There is sparse data regarding the individual surgeon's practice patterns and the preferred surgical technique for the treatment of SUI by the individual surgeon especially when concomitant prolapse surgery is indi-

cated. The primary aim of our study was to compare surgeons' preference for surgical treatment for SUI in 2013 to a survey performed on the same surgical society fifteen years prior in 1998. Our secondary aim was to describe the practice pattern of surgeons for treatment of SUI in present time when concomitant prolapse surgery is indicated.

METHODS

This was an anonymous cross-sectional study performed at the American Urogynecologic Society's (AUGS) annual meeting in 1998 and repeated again in 2013. The study was identified as exemption for IRB approval based on 45 CFR 46 IRB exemption categories. AUGS research committee reviewed and approved our study. A self-administered paper-based questionnaire was included in the initial registration packet given to each participant in the meeting. Individual physicians were asked to complete the survey any time during the four days of the meeting and return it to a designated collection box in the meeting area. Registrants who were not surgeons were asked to return the surveys incomplete.

Each questionnaire consisted of nineteen questions requesting both quantitative and qualitative data. The first seven questions documented the demographic data of the responder on age-category, race, gender, the type of practice, training time, proportion of procedures related to SUI, and proportion of procedures to treat urogynecologic/pelvic floor disorders. The remaining questions inquired about the surgical method that the individual surgeon used for SUI treatment in different circumstances. A six point and four point preference scale, choices of procedures, and yes/no responses were employed. See Tables 1-4 below.

All statistical analysis was performed with the SAS V9.2. Chi-Square tests were utilized to test differences in demographic characteristics between the two surveys as well as preferences and proportions for yes/no questions (Table 1 & 4). In questions where no comparison could be made due to the questions being different from 1998 to 2013, counts, proportions and 95% CIs were presented. Although there

were multiple comparisons being assessed, an alpha of 0.05 was deemed to be significant.

RESULTS

A total of 136 participants responded in 1998 and 137 responded in 2013. The demographic data for the survey participants are summarized in Table 1. The majority of the respondents in 1998 were male (54%) compared to 2013 when the majority was female (56%). The age of the respondents shifted over time from ages 41-50 (39%) in 1998 to less than 40 years of age in 2013 (52.6%). There was an increase in the proportion of respondents who had completed a formal, three-year Female Pelvic Medicine and Reconstructive Surgery fellowship after residency, with 1.5% of respondents completing a fellowship in 1998 and 52% of respondents in 2013.

Surgeon's preferred surgical approach for primary SUI treatment and in different concomitant surgery cases:

The preferred surgical techniques based on different concomitant surgical indications are summarized in Table 2. The preferred procedure reported for treatment of primary SUI in 1998 was transabdominal retropubic urethropexy, consisting of 67.5% of all surgeries performed for SUI. In 2013, the MUS was reported as the preferred surgery for the treatment of SUI (89%), while transabdominal urethropexy was only performed 6.2% of the time. In 1998, retropubic urethropexy was reported as the most preferred

TABLE 1. – Demographic characteristics of survey participants - n (%).

	Surv, fall 1998 n=136	Survey, fall 2013 n=137	P-Value from Chi-Square Test
Gender			
Female	62 (45.6)	77 (56.2)	0.0794
Male	74 (54.4)	60 (43.8)	
Age			
< 40	71 (52.6)	37 (27.2)	0.0001
41-50	43 (31.8)	53 (39.0)	
51-60	16 (11.9)	35 (25.7)	
61-70	4 (3.0)	11 (8.1)	
> 70	1 (0.7)	-	
Type of practice			
Full time university	64 (47.4)	56 (42.1)	0.6650
University affiliated	30 (22.2)	34 (25.6)	
Private practice	41 (30.4)	43 (32.3)	
Formal Urogynecology training beyond Ob/Gyn residency			
None	42 (31.6)	26 (19.0)	<0.0001
six months	21 (15.8)	6 (4.4)	
One year	36 (27.1)	14 (10.2)	
Two years	32 (24.1)	21 (15.3)	
Three years	2 (1.5)	70 (51.1)	
Approximate number of procedures to treat SUI in a year			
1-10	3 (2.2)	2 (1.5)	0.0637
11-50	60 (44.1)	45 (32.9)	
51-100	55 (40.4)	56 (40.9)	
>100	18 (13.2)	34 (24.8)	
Proportion of practice strictly related to urogynecology			
<10%	1 (0.7)	1 (0.7)	<0.0001
11-51%	60 (44.4)	5 (3.7)	
>50%	74 (54.8)	131 (95.6)	

TABLE 2. – Mean and 95% Confidence Intervals for Rankings of Surgeon's preferred surgical approach for primary SUI treatment in different concomitant surgery cases.

Clinical preference	Fall 1998 n=136	Fall 2013 n=137
Average proportion of procedures annually for treatment of primary SUI		
1 - Anterior colporrhaphy	11.7 (8.1, 15.3)	4.9 (2.6, 7.2)
2 - Artificial sphincter	8.3 (1.2, 15.5)	1 (**, **)
3 - Periurethral collagen injection	11.3 (9.7, 12.9)	8.1 (6.6, 9.5)
4 - Sling procedures	26.1 (21.7, 30.5)	7.4 (2.0, 12.8)
5 - Transabdominal retropubic urethropexy	67.5 (63.1, 71.8)	6.2 (4.4, 8.0)
6 - Transvaginal (needle) retropubic urethropexy	16.8 (10.2, 23.4)	5.3 (1.1, 9.6)
7 - Mid-Urethral Synthetic sling	NA	89.0 (86.5, 91.4)
Average rank the following procedures for the treatment of primary genuine stress urinary incontinence		
1 - Anterior colporrhaphy	1.74 (1.59, 1.90)	1.62 (1.45, 1.79)
2 - Artificial sphincter	3.64 (3.31, 3.97)	2.83 (2.54, 3.12)
3 - Periurethral collagen injection	2.80 (2.62, 2.99)	3.27 (3.12, 3.41)
4 - Sling procedures	5.46 (5.34, 5.58)	4.55 (4.33, 4.77)
5 - Transabdominal retropubic urethropexy	5.36 (5.25, 5.47)	4.60 (4.44, 4.76)
6 - Transvaginal (needle) retropubic urethropexy	2.87 (2.70, 3.04)	2.82 (2.59, 3.05)
7 - Mid-Urethral Synthetic sling	NA	5.55 (5.38, 5.71)
Average Rank for the procedure given concomitant need for vaginal hysterectomy		
1 - Anterior colporrhaphy	2.37 (2.11, 2.63)	1.80 (1.59, 2.02)
2 - Artificial sphincter	1.31 (1.13, 1.49)	1.17 (1.04, 1.31)
3 - Periurethral collagen injection	1.88 (1.66, 2.09)	2.50 (2.25, 2.75)
4 - Sling procedures	4.22 (3.91, 4.54)	2.6(2.40, 2.98)
5 - Transabdominal retropubic urethropexy	5.20 (4.98, 5.42)	2.34 (2.08, 2.60)
6 - Transvaginal (needle) retropubic urethropexy	2.61 (2.34, 2.89)	1.78 (1.54, 20.3)
7 - Mid-Urethral Synthetic sling	NA	5.71 (5.52, 5.90)
Average Rank for procedure given concomitant need for abdominal hysterectomy or other transabdominal procedure		
1 - Anterior colporrhaphy	1.50 (1.33, 1.66)	1.40 (1.24, 1.57)
2 - Artificial sphincter	1.28 (1.12, 1.45)	1.19, 1.04, 1.35)
3 - Periurethral collagen injection	1.74 (1.54, 1.94)	2.06 (1.82, 2.30)
4 - Sling procedures	3.75 (3.45, 4.04)	2.49 (2.22, 2.77)
5 - Transabdominal retropubic urethropexy	5.81 (5.71, 5.92)	3.86 (3.58, 4.14)
6 - Transvaginal (needle) retropubic urethropexy	1.77 (1.55, 2.00)	1.71 (1.48, 1.94)
7 - Mid-Urethral Synthetic sling	NA	5.43 (5.22, 5.64)
Average Rank for procedure given concomitant need for pelvic organ prolapse repair that requires a transabdominal approach		
1 - Anterior colporrhaphy	1.67 (1.45, 1.89)	1.49 (1.30, 1.68)
2 - Artificial sphincter	1.27 (1.12, 1.41)	1.18 (1.02, 1.34)
3 - Periurethral collagen injection	1.69 (1.49, 1.89)	2.00 (1.77, 2.23)
4 - Sling procedures	3.93 (3.64, 4.23)	2.38 (2.11, 2.65)
5 - Transabdominal retropubic urethropexy	5.76 (5.64, 5.89)	3.71 (3.42, 4.00)
6 - Transvaginal (needle) retropubic urethropexy	1.82 (1.59, 2.06)	1.65 (1.41, 1.90)
7 - Mid-Urethral Synthetic sling	NA	5.46 (5.24, 5.68)
<i>Note: A 1-6 scale was used for both years; 1 presents the less preferred and 6 presents the most preferred technique, NA =procedure not available in 1998 ***= all values were the same so no 95% CI could be calculated.</i>		

TABLE 3. – Surgeon’s preferred surgical approach for SUI treatment influenced by patient’s situation – n (%).

Clinical preference	Fall 1998 n=136	Fall 2013 n=137	P-Value from Chi-Square Test
Degree to which patient preference for a transvaginal procedure influences your decision to perform a vaginal compared to a transabdominal procedure*			
1	33 (24.8)	30 (22.6)	<0.0001
2	45 (33.8)	24 (18.1)	
3	43 (32.3)	30 (22.6)	
4	12 (9.0)	49 (36.7)	
Do you counsel patients that transvaginal retropubic urethroplexies are less efficacious than transabdominal retropubic urethroplexies?			
Yes	115 (87.1)	50 (40.7)	<0.0001
No	17 (12.9)	73 (59.4)	
Does the presence of a large abdominal girth or pannus influence your preference away from abdominal procedure toward vaginal procedure?			
Yes	57 (43.5)	89 (66.4)	<0.0002
No	74 (56.5)	45 (33.6)	
Do you routinely perform complex cystometrics prior to proceeding to anti-incontinence surgery?			
Yes	116 (87.2)	89(66.9)	<0.0001
No	17 (12.8)	44 (33.1)	
Does presence of a chronic cough or other condition that results in habitual increase in intra abdominal pressure influence your choice of surgical procedure?			
Yes	122 (90.4)	85 (63.0)	<0.0001
No	13 (9.6)	50 (37.0)	

surgical approach for incontinence for primary SUI regardless of whether other abdominal or vaginal procedures were planned. In 2013, MUS was reportedly the most preferred procedure regardless of need for concomitant abdominal or vaginal surgeries.

Surgeon’s preferred surgical approach for SUI treatment influenced by patient’s characteristics:

The degree to which patients’ preference for a transvaginal procedure influenced surgeon’s decision to perform a vaginal procedure compared to a trans-abdominal procedure increased from 9% to 36.7% in 1998 and 2013, respectively. The approach to the treatment of patients with a large abdominal girth changed over time with 43.5 % of surgeons in 1998 choosing a vaginal approach for incontinence treatment compared to 66.4% of surgeons in 2013. A majority of the time, complex cystometrics was routinely performed prior to an anti-incontinence surgery in both 1998 and 2013 for 87.2% and 66.9%, respectively (Table 3).

Two different case scenarios were described in the survey, one implying low urethral pressure and the other implying low leak point pressure. Participants were asked to suggest their preferred surgical approach. In both cases, pubovaginal sling procedures and mid-urethral sling procedures were the most preferred methods of treatment in 1998 and 2013, respectively (Table 4).

DISCUSSION

Our study documented the notable change in reported surgical management of stress urinary incontinence from 1993 to 2013. Currently, MUS surgery is preferred surgical method for treatment of primary SUI based on the survey results. This technique is also the preferred method by surgeons in cases with indication of concomitant abdominal or vaginal surgeries. Reported current practice relegates trans-abdominal retropubic urethropey to only 6.2% of annual surgeries performed for SUI treatment. Even in the case of concomitant abdominal surgery, surgeons preferred to perform MUS.

Based on literature, transabdominal retropubic urethropey can be as effective as MUS.^{3,14,15} Our study showed that over time, surgeons’ preferred surgical technique for SUI has dramatically changed. This change has occurred even with recent evidence demonstrating a significant cure rate with the use of abdominal urethropey, particularly when concomitant abdominal procedure is indicated for the patient.

In 2007 Sivaslioglu et al. performed a randomized comparison of transobturator tape (TOT) and Burch colposuspension in the treatment of female stress urinary incontinence (14). 100 women were recruited in the study with a 24 months follow up period. TOT procedure resulted in similar cure rates of SUI at 1 and 2 years compared to Burch procedure. The TOT procedure had a shorter operative time and length of hospital stay. Foote et al. in a study on 97 women aimed to determine if laparoscopic colposuspension was as effective as vaginal suburethral slingplasty.¹⁵ Upon a follow up of 24 months, the success rates were similar (88.3 vs 81.8%), and they observed that laparoscopic colposuspension is as effective as vaginal suburethral slingplasty after two years’ follow-up.

A recently published meta-analysis including ten clinical trials comparing the objective and subjective cure rates between Burch abdominal (open or laparoscopic) urethropey with MUS operations did not show significant difference for MUS to Burch.³ Schimpf *et al.* in this review recruited 10 clinical trials that had compared Burch abdominal (open

TABLE 4. – Surgeon’s preferred surgical approach for SUI treatment in two specific case scenarios.

Clinical preference	Fall 1998 n=136	Fall 2013 n=137
<i>Given a patient with a static urethral pressure profile of < 20 cm H2O which procedure do you most favor for treatment?</i>		
1 - Anterior colporrhaphy	0	0
2 - Artificial sphincter	0	1 (0.8)
3 - Periurethral collagen injection	8 (6.11)	9 (6.8)
4 - Sling procedures	110 (84.0)	2 (2.52)
5 - Transabdominal retropubic urethropey	13 (9.9)	0
6 - Transvaginal (needle) retropubic urethropey	0	1 (0.8)
7 - Mid-Urethral Synthetic sling	NA	119 (90.2)
<i>Given a patient with a leak point pressure of < 60 cm H2O which procedure do you most favor for treatment?</i>		
1 - Anterior colporrhaphy	1 (0.8)	0
2 - Artificial sphincter	0	1 (0.8)
3 - Periurethral collagen injection	11 (8.4)	4 (3.0)
4 - Sling procedures	99 (75.6)	2 (1.5)
5 - Transabdominal retropubic urethropey	19 (14.5)	0
6 - Transvaginal (needle) retropubic urethropey	1 (0.8)	0
7 - Mid-Urethral Synthetic sling	NA	126 (94.7)

or laparoscopic) urethropexy with mid-urethral sling operations.³ Meta-analysis of objective cure did not show significant difference for MUS to Burch (OR, 1.18; 95% CI, 0.73-1.89). For subjective cure, no significant differences were observed for these two techniques (OR, 1.12; 95% CI, 0.79-1.60). In summary, for women considering MUS or Burch procedures for treatment of SUI, they suggested either intervention for objective and subjective cure, with the decision based on adverse events and other planned concomitant surgeries (vaginal vs abdominal).

Persson *et al.* compared the costs of laparoscopic Burch colposuspension to TVT to the country in a randomized prospective study in 270 women.¹⁶ They showed that laparoscopic Burch colposuspension was less expensive to the country than TVT.

Additionally, a majority of respondents in this survey perform complex cystometrics prior to proceeding to anti-incontinence surgery despite evidence that this may not be necessary for patients with simple SUI. The VALUE trial, published in 2012, suggested that women with uncomplicated SUI might only need a basic office evaluation for a preoperative workup.¹⁷ In the VALUE trial, complex cystometrics did not improve the rate of treatment success compared to those who only underwent an office-based evaluation. While our data shows the rate complex cystometrics has declined from 87% in 1998 to 67% in 2013, this trend will be interesting to watch as the pendulum swings towards cost-effective, efficient delivery of care.

Our study has added valuable information to the practice patterns of surgeons for the surgical treatment of SUI, however certain limitations exist. This was a self-administered questionnaire, and has greater chance of having no response items compared to interviewer-administered questionnaires. Alternately, self-administered questionnaires are less susceptible to information bias and can easily capture a large sample size. Another limitation can be noted in our study population, which included surgeons who participated in AUGS's meeting. This population can generate a selection bias as these surgeons may be from larger academic institution and potentially early adapters of new techniques. However, access to the same study population after 15 years is a definite strong point and makes our results reliable to compare during this period of time to show the existing change in practice patterns and preference on surgical procedures.

This study documents changes in surgical practices in SUI, which directly influences patient care. Surgeons in this cohort prefer to perform mid-urethral sling for surgical treatment of SUI even when concomitant abdominal surgery is indicated, while abdominal urethropexy occupies only 6.2% of annual surgeries performed presently. We suggest a long term follow up clinical trial to evaluate the cost of practice changes and to illustrate its effects on patients' subjective and objective outcomes. Given this reportedly low rate of performance, it is unlikely that trainees in OB/GYN or Urology will be exposed to this effective treatment option in routine clinical practice. If retropubic urethropexy is to remain relevant, other training methods such as simulation should be considered.

CONFLICTS

No conflict of interest of any of the Authors.

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Correspondence to:

Ghazaleh Rostaminia
3300 Gallows Road - FallsChurch VA - United States
E-mail: ghazaleh.rostaminia@inova.org