OUTCOMES ASSESSMENT

Retrospective Analysis of Sexual Function After Transvaginal Mesh Surgery

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ABSTRACT

Introduction: Despite ample research regarding the impact of reconstructive surgery on anatomic/functional outcomes of pelvic organ prolapse (POP), including incidence of dyspareunia, evidence regarding sexual outcomes is equivocal.

Aim: To assess changes in sexual function in women followed up for at least 12 months after transvaginal mesh surgery for POP.

Methods: We conducted a retrospective review of women who underwent surgery for POP using different mesh products between 2008 and 2019. Baseline demographics were compiled along with intraoperative and postoperative information. The Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire short form (PISQ-12) was used to assess sexual function.

Main Outcome Measures: Women sexually active before and after surgery were assessed to determine changes in overall and question-specific PISQ-12 responses and potential factors to explain sexual function after surgery.

Results: 622 women underwent surgery using mesh at our center. 360 (58%) attended at least one visit at a median of 12 months (IQR 11−23 months), with 113 (31%) sexually active at baseline and 247 (69%) sexually inactive. 97 had complete PISQ-12 responses before and after surgery. There was an overall improvement in the median PISQ-12 scores of 2 points ($P < .001$); improvements persisted when scores were stratified by various factors. Specific improvements were noted in climax ($P = .046$) and orgasm intensity ($P = .002$), fear ($P < .001$) or actual incontinence during intercourse ($P = .004$), avoidance of intercourse due to prolapse ($P < .001$), and negative emotions ($P < .001$). There was a slight positive effect of the baseline PISQ-12 score on the postoperative PISQ-12 score (regression coefficient 0.24, 95% CI: 0.09-0.39), and a stronger negative effect of having a concomitant anal sphincteroplasty (−4.84, 95% CI: −8.42 to −1.25). Preoperative prolapse stage was not associated with postoperative sexual outcomes. There was a weak negative association between the postoperative PISQ-12 and Pelvic Organ Prolapse Distress Inventory-6 (POPDI-6) scores [$r_s(95) = -0.27$, $P = .008$] and a moderate negative association between postoperative PISQ-12 and total Pelvic Floor Distress Inventory short form [$r_s(94) = -0.42$, $P < .001$].

Conclusion: Transvaginal mesh surgery appears to positively impact sexual function, and improvements were independent of mesh or baseline prolapse severity. **Khandwala S, Cruff J, Williams C. Retrospective Analysis of Sexual Function After Transvaginal Mesh Surgery. Sex Med 2021;9:100281.**

Key Words: Pelvic Reconstructive Surgery; Pelvic Organ Prolapse; PISQ-12; Sexual Health; Transvaginal Mesh

INTRODUCTION

Pelvic organ prolapse (POP) is a highly prevalent condition occurring in up to 50% of parous women.[1] The lifetime risk of undergoing a POP or urinary incontinence operation in the United States is 11.1%.[2] When it comes to surgical management of POP, anatomic cure has been the focus of most studies. However, the female introitus, vulva, and vaginal cavity have crucial roles in the sexual function and well-being of women. It would seem that the presence of POP should have some effect on sexual functioning; however, studies regarding this question have been equivocal.[3,4] Other studies have reported that POP negatively impacts sexual function. In a study by Barber et al,[5] one-third of women reported that POP affected their ability to have sexual relations. Novi et al,[6] using the Pelvic Organ Prolapse/

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Urinary Incontinence Sexual Questionnaire short form (PISQ-12) to compare sexual function in women with and without POP noted lower total mean scores in women with POP than in controls.

This same variation persists when assessing the role of surgical management of POP on sexual function. Results from 2 previous prospective studies[3,5] showed that overall sexual satisfaction after pelvic reconstructive surgery using native tissue did not change. Transvaginal mesh has been incorporated into surgical repairs to augment weakened endopelvic tissue, but a number of studies have equivocal results regarding sexual outcomes. Sentilhes et al[7] demonstrated improved sexual function having less avoidance due to POP and improved orgasm. Other studies using the PISQ-12 show deterioration in sexual function.[8,9] Gauruder-Burmester et al[10] show no changes in sexual function. Thus, there is conflicting reporting on the role of both POP and POP surgery on sexual function in women.

We were interested in looking back at our experience using mesh in pelvic reconstructive surgery to investigate the overall effect of this method on sexual function. Thus, the aim of this study was to assess changes in the PISQ-12 scores from the preoperative to postoperative periods in women followed up at least 12 months after transvaginal mesh surgery for POP with the null hypothesis being no significant differences in the median PISQ-12 scores from baseline. Secondary aims were to identify factors independently associated with these changes and changes by individual PISQ-12 responses.

MATERIALS AND METHODS

This was a retrospective chart review of women who underwent vaginal surgery for POP using 3 different mesh products—Prolift + M (Ethicon Inc, Somerville, NJ), Exair (Coloplast, Humlebaek, Denmark), or Restorelle DirectFix (Coloplast, Humlebaek, Denmark)—at our center between September 2008 and April 2019. The Beaumont Health Institutional review board approved the study. Informed consent was not required from the subjects. Study inclusion criteria were all female subjects of the senior author (S.K.) who underwent pelvic reconstructive surgery using one of the 3 synthetic mesh products for symptomatic POP. Subjects who did not attend a follow-up visit at least 12 months from surgery or who had incomplete information regarding sexual function were excluded. 12 months was chosen as the follow-up endpoint, but those who presented as early as 10 months were included in the analysis.

At baseline, subjects underwent a complete history and examination. Baseline demographics included age, body mass index, menopause status, parity, prior prolapse surgery, prior hysterectomy, tobacco use, and Pelvic Organ Prolapse Quantification System[11] assessment. Subjects also completed the PISQ-12[12] and the Pelvic Floor Distress Inventory short form (PFDI-20)[13] at baseline. The PISQ-12[12] was used for sexual function assessment and is a valid and reliable instrument to assess treatment or intervention effects. Higher total PISQ-12 scores indicate better sexual function. Baseline dyspareunia was determined as an affirmative response to PISQ-12 question #5 asking "do you feel pain during sexual intercourse?" and answered as "sometimes", "usually", or "always". The PFDI-20[13] is a symptom-specific questionnaire comprised of 3 subscales assessing pelvic floor/prolapse (POPDI-6), colorectal (Colorectal-Anal Distress Inventory-8 [CRADI-8]; Urinary Distress Inventory-6 [UDI-6]), and urinary (UDI-6) complaints. The entire PFDI-20 was completed, but we were specifically interested in responses to the POPDI-6 subscale that asks questions related to the patient suffering from POP. Baseline pelvic pain was determined as an affirmative response to PFDI-20 question #20 asking "do you usually experience pain or discomfort in the lower abdomen or genital region?" and answered as "moderately" or "quite a bit." Surgical information included the mesh product used, mesh procedure type (anterior, posterior, or total), and any concomitant procedures that were performed. A vaginal examination was completed for anatomic assessment and to determine any mesh-related complications $\geq$12-month postoperative period. Subjects also repeated the PFDI-20 and PISQ-12 questionnaires at the follow-up visit. Those sexually active both before and after surgery were compared to determine changes in overall and question-specific PISQ-12 responses and potential risk factors to explain sexual function after surgery.

No power calculation was specified *a priori* in this study as the goal was to describe changes in sexual function before and after transvaginal mesh reconstructive surgery. Data are presented as the means ± standard deviation, median (interquartile range), or number (proportion). Statistical analysis was performed by an independent samples t-test, a chi-square/Fisher's exact test, where appropriate, for categorical data, or Wilcoxon signed-rank test for paired nonparametric data. To determine covariates associated with postoperative PISQ-12 responses, univariate regression analyses were performed. Multivariate analysis was then performed where all covariates were included in one model to predict the mean change of the dependent variable (postoperative PISQ-12 scores), given a one-unit change in the independent variable while holding the other variables in the model constant. Regression coefficients were determined with 95% CIs. We used Akaike information criterion model selection to determine the best-fit model for our data, and this included each parameter. Spearman's correlation was performed to determine any associations between postoperative PISQ-12 scores and PFDI-20/POPDI-6. $P < .05$ was considered statistically significant.

RESULTS

Between September 2008 and April 2019, 622 women underwent pelvic reconstructive surgery using transvaginal mesh at our center. 360 (58%) of these were initially followed up in the immediate postoperative period and then attended at least one follow-up visit at a median of 12 months (interquartile range:

Table 1. Baseline characteristics of sexually active and non-sexually active subjects

	n	Sexually active (N = 113)	*n*	Not sexually active (N = 247)	*P**
Age (years)	113	59 ± 10	247	70 ± 9	<.001
Body mass index (kg/m^2)	112	28.3 ± 5.3	243	29.0 ± 5.3	.237
Menopausal status, *n* (%)	113		247		<.001
Premenopausal		14 (12)		6 (2)	
Postmenopausal		99 (88)		241 (98)	
Parity	110	3 (2-3)	241	3 (2-4)	.162
Tobacco use, *n* (%)	113		246		.839
Smoker		8 (7)		16 (7)	
Nonsmoker		105 (93)		230 (93)	
Prior prolapse surgery, *n* (%)	113		247		.592
Yes		17 (15)		32 (13)	
No		96 (85)		215 (87)	
Prior hysterectomy, *n* (%)	113		247		.488
Yes		48 (42)		96 (39)	
No		65 (58)		151 (61)	
Baseline prolapse stage, *n* (%)	113		246		<.001
II		25 (22)		15 (6)	
III		56 (50)		119 (48)	
IV		32 (28)		112 (46)	
Baseline pelvic pain, *n* (%)	105		206		.588
Yes		29 (28)		63 (31)	
No		76 (72)		143 (69)	
Mesh type, *n* (%)	113		247		.090
Prolift + M		63 (56)		107 (43)	
Exair		18 (16)		50 (20)	
Restorelle DirectFix		32 (28)		90 (36)	
Type of repair, *n* (%)	113		247		.112
Anterior		2 (2)		11 (4)	
Posterior		32 (28)		49 (20)	
Total		79 (70)		187 (76)	
Concomitant surgery, *n* (%)	113		247		.632
Yes		67 (59)		153 (62)	
No		46 (41)		94 (38)	

Data are presented as mean ± standard deviation, median (interquartile range), or by proportion.
*Determined by an independent samples t-test, Mann-Whitney U-test, or chi-square test, where appropriate.

11-23 months) and had information regarding their sexual disposition. Regarding baseline sexual activity, 113 (31%) women were sexually active, and 247 (69%) were not. As featured in Table 1, subjects not sexually active were older (70 ± 9 vs 59 ± 10, $P < .001$) on average, postmenopausal (98% vs 88%, $P < .001$), and had more advanced prolapse (stages III-IV) (94% vs 78%, $P < .001$) than those who were sexually active.

97 women had complete PISQ-12 responses before and after surgery. A separate analysis comparing sexually active women who completed the PISQ-12 (n = 97) with those sexually active women who did not complete the questionnaire or return for follow-up (n = 66) did not reveal any significant differences between these groups (see Table 2). Regards the 97 subjects with complete PISQ-12 information, there was an overall significant increase in the median PISQ-12 score by 2 points from baseline (see Table 3). This statistically significant increase also persisted when PISQ-12 scores were stratified separately according to age, BMI, parity, menopause status, tobacco use, baseline prolapse stages III-IV (advanced stages of prolapse), concomitant procedures performed, mesh used, and mesh procedure type. The only stratified PISQ-12 score not statistically increased after surgery was for those with baseline stage II prolapse.

Individual PISQ-12 questions were compared from baseline to follow-up as shown in Table 4. PISQ-12 subscale improvements were noted for climax and intensity of orgasm, fear of or actual incontinence during intercourse, avoidance of intercourse due to prolapse, and having negative feelings/emotions.

Results of Spearman's correlation analysis indicated that there was a weak negative association between postoperative PISQ-12 and POPDI-6 scores [$r_s(95) = -0.27$, $P = .008$] and a more

Table 2. Comparison of sexually active PISQ-12 completers versus noncompleters

	n	Sexually active completers (n = 97)	*n*	Sexually active noncompleters (n = 66)	*P**
Age (years)	97	58 ± 10	66	60 ± 9	.242
Body mass index (kg/m^2)	97	28.3 ± 5.5	65	27.8 ± 5.1	.519
Menopausal status, *n* (%)	97		66		.730
Premenopausal		12 (12)		7 (11)	
Postmenopausal		85 (88)		59 (89)	
Parity	95	3 (2–3)	63	3 (2–3)	.516
Tobacco use, *n* (%)	97		66		.600
Smoker		8 (8)		4 (6)	
Nonsmoker		89 (92)		62 (94)	
Prior prolapse surgery, *n* (%)	97		66		.439
Yes		16 (16)		8 (12)	
No		81 (84)		58 (88)	
Prior hysterectomy, *n* (%)	97		65		.816
Yes		40 (41)		28 (43)	
No		57 (59)		37 (57)	
Baseline prolapse stage, *n* (%)	97		65		.857
II		21 (22)		12 (18)	
III		50 (52)		36 (55)	
IV		26 (27)		17 (26)	
Baseline pelvic pain, *n* (%)	90		53		.647
Yes		27 (30)		14 (26)	
No		63 (70)		39 (74)	
Baseline dyspareunia, *n* (%)	97		47		.805
Yes		29 (30)		15 (32)	
No		68 (70)		32 (68)	
Baseline PISQ-12 score	97	36.0 (30.0–39.0)	44	34.0 (29.5–39.0)	.516

PISQ-12 = Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire short form.
Data are presented as mean ± standard deviation, median (interquartile range), or by proportion.
*Determined by an independent samples t-test, Mann-Whitney U-test, or a chi-square test.

moderate negative association between postoperative PISQ-12 and PFDI-20 scores [$r_s(94) = -0.42$, $P < .001$].

From univariate regression analysis (see Table 5), the only covariates that were significantly associated with responses in postoperative PISQ-12 scores were baseline PISQ-12 scores (regression coefficient 0.24, 95% CI: 0.09–0.39) and those who had concomitant anal sphincterplasty procedures (−4.84, 95% CI: −8.42 to −1.25). Table 6 presents results from multivariate analysis where these same variables remained significant when adjusted for the other covariates.

In regard to the rate of mesh exposure, from the original cohort of 360 women, 247 had examination information available and 8 (3.2%) had exposures at the time of follow-up. 17 of 355 (4.8%) subjects reported pelvic pain at postoperative follow-up.

DISCUSSION

This study shows a positive impact on sexual function after transvaginal mesh surgery for POP as assessed by the validated PISQ-12 questionnaire. The improvement in PISQ-12 scores were seen for all mesh types, and hence, this indicates that overall transvaginal mesh surgery for POP has a positive impact. This is contrary to the findings by Su et al[9] who noted a negative impact of transvaginal Prolift (Ethicon Inc, Somerville, NJ) surgery on sexual function at 6 months follow-up. However, the authors also noted some improvement in patients seen at 1-year follow-up. They suggest that 6-month follow-up may not be a true indication of postoperative sexual function, and a longer term follow-up is necessary. At our ≥12-month follow-up, we saw a positive effect.

Altman et al[8] reported reductions in PISQ-12 scores of almost 4 points 1 year after trocar-guided transvaginal mesh surgery using Prolift because of deterioration in behavior/emotive and partner-related aspects. In our study, we noted improved emotive subscale and no change in the partner subscale. Similar to our findings regarding PISQ-12 subscale improvements, Sentilhes et al[7] also noted improvements in avoidance of intercourse because of POP and in the number of women reporting orgasm, having the same or higher intensity after surgery. However, Rogers et al[14] found no change in intensity of orgasm. Similar to our findings, Sentilhes et al[7] also found no significant differences

Table 3. Overall and stratified analysis of PISQ-12 scores at baseline and follow-up

	n	Baseline	Postoperative	*P**
Overall PISQ-12 score	97	36.0 (30.0–39.0)	38.0 (36.0–41.0)	<.001
Body mass index (kg/m^2)				
≤25	26	37.0 (34.3–39.0)	40.5 (38.0–42.0)	<.001
>25	71	34.0 (29.0–38.5)	38.0 (35.0–40.0)	<.001
Menopause				
Yes	85	36.0 (29.0–39.0)	38.0 (36.0–40.0)	<.001
No	12	35.5 (30.8–39.5)	41.0 (37.5–42.0)	.048
Tobacco user				
Yes[†]	8	36.5 (34.8–38.8)	38.0 (35.5–40.3)	–
No	89	35.0 (30.0–39.0)	38.0 (36.0–41.0)	<.001
Concomitant surgery				
Yes	58	34.0 (29.0–37.0)	38.0 (35.3–40.0)	<.001
No	39	37.0 (34.0–39.5)	40.0 (36.0–42.0)	.010
Age				
≤65	77	35.0 (30.0–39.0)	38.0 (36.0–41.0)	<.001
>65	20	36.5 (32.0–38.3)	37.0 (34.8–40.0)	.030
Parity				
<3	43	36.0 (29.0-39.0)	37.0 (34.5-41.0)	.002
≥3	52	36.0 (31.0-39.0)	39.0 (37.0-41.0)	<.001
Baseline prolapse stage				
II	21	36.0 (31.0–39.0)	37.0 (34.0–41.0)	.204
III	50	36.0 (30.0–39.0)	39.0 (36.3–40.8)	<.001
IV	26	34.5 (29.0–37.0)	38.0 (36.0–40.0)	<.001
Mesh type				
Prolift + M	52	35.5 (30.0–39.0)	38.0 (34.8–41.0)	.003
Exair	17	36.0 (29.0–39.0)	38.0 (36.0–40.0)	.012
Restorelle DirectFix	28	35.5 (29.8–38.3)	39.0 (37.0–41.3)	.001
Anterior mesh repair	1	–	–	N/A
Posterior mesh repair	28	37.0 (33.5–40.0)	40.5 (35.8–42.0)	.023
Total mesh repair	68	34.5 (29.0–38.0)	38.0 (36.0–40.0)	<.001

PISQ-12 = Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire short form.
Data are presented as the median (interquartile range).
*Determined by a Wilcoxon signed-rank test.
[†]<10 subjects; an accurate *P*-value could not be determined.

in women reporting partner difficulty having erections or with premature ejaculation.

A normative PISQ-12 score of 40 has been suggested for sexually active women without pelvic floor disorders, namely POP or urinary incontinence; women bothered by POP/incontinence had a mean score of 36 (±5.6).[15] In our study, the median preoperative PISQ-12 score was 36, compared with a median postoperative score of 38.

According to responses to the PISQ-12, we found no significant differences in dyspareunia from before to after surgery. Despite deterioration in overall sexual function from partner-related and behavioral-emotive factors, Altman et al[8] also showed no changes in dyspareunia per the PISQ-12 in their study. It is generally understood that prolapse by itself does not cause pain or dyspareunia, so no changes in this study may indicate unresolved dyspareunia from another condition (eg, vaginal atrophy or bladder pain syndrome) that would not be addressed by the surgical intervention.

In our study, preoperative prolapse stage was not significantly associated with the PISQ-12 score. On multivariate regression analysis, preoperative prolapse stage was not significantly associated with the postoperative PISQ-12 score. Moreover, despite finding a statistically significant negative correlation between postoperative PISQ-12 and POPDI-6 scores (ie, as prolapse symptoms improve with a lower POPDI-6 score, PISQ-12 scores increase for improved sexual function), the association was weak ($r_s = -0.27$) and only slightly more moderate ($r_s = -0.42$) for the composite PFDI-20 score that incorporates other urinary and colorectal aspects of pelvic floor dysfunction. Similarly, others such as Lowenstein et al[16] demonstrated that worse sexual function is associated with severe subjective prolapse symptoms and self-perceived body image and not with the physical stage of the prolapse.

Table 4. Individual PISQ-12 responses at baseline and at postoperative follow-up

PISQ-12		*n*	Baseline	Postoperative	*P**
Total		97	36.0 (30.0–39.0)	38.0 (36.0–41.0)	<.001
q1	Sexual desire	95	2.0 (2.0–3.0)	3.0 (2.0–3.0)	.430
q2	Climax (orgasm)	96	2.5 (2.0–3.0)	3.0 (2.0–3.0)	.046
q3	Sexual excitement	95	3.0 (2.0–3.0)	3.0 (3.0–4.0)	.080
q4	Satisfaction with sexual activities	96	3.0 (2.0–4.0)	3.0 (3.0–4.0)	.317
q5	Dyspareunia	97	3.0 (2.0–4.0)	3.0 (2.0–4.0)	.944
q6	Having incontinence with intercourse	97	4.0 (3.0–4.0)	4.0 (4.0–4.0)	.004
q7	Fear of incontinence with intercourse	97	4.0 (3.0–4.0)	4.0 (4.0–4.0)	<.001
q8	Avoidance of sex because of prolapse	94	3.0 (1.3–4.0)	4.0 (4.0–4.0)	<.001
q9	Having negative emotions	97	4.0 (3.0–4.0)	4.0 (4.0–4.0)	<.001
q10	Partner's erections	93	4.0 (2.0–4.0)	4.0 (2.0–4.0)	.984
q11	Partner's premature ejaculation	96	4.0 (4.0–4.0)	4.0 (4.0–4.0)	.418
q12	Intensity of orgasm	89	2.0 (1.0–2.0)	2.0 (1.0–2.0)	.002

PISQ-12 = Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire short form.
Data are presented as the median (interquartile range).
*Determined by a Wilcoxon signed-rank test.

Transvaginal mesh for use in pelvic reconstructive surgery was introduced to help mitigate the risks of recurrent prolapse. However, there were a number of complications reported to the FDA resulting in reclassifying mesh as a class III device,[17] with its eventual discontinuation for transvaginal use in April 2019,[18] citing a lack of superiority over native tissue repair. Therefore, the 3 mesh kits featured in this study are currently not manufactured or sold in the United States. Transvaginal mesh may still benefit certain patients, especially those who have failed a prior native tissue surgery or who desire prolapse repair with uterine preservation. Despite these mesh kits no longer being commercially available, our results may be useful to those planning longer term safety and efficacy studies using synthetic materials or to those who may be using biologic mesh in pelvic reconstructive procedures. In addition, a 2016 Cochrane review by Maher et al[19] showed that from a sexual function/dyspareunia

Table 5. Univariate regression analysis

	Regression coefficient (95% CI)	*P*
Age	−.09 (−.18 to .01)	.077
Menopause	−2.41 (−5.14 to .31)	.086
Parity	.28 (−.44 to 1.00)	.450
Baseline pelvic pain	1.57 (−.5 to 3.64)	.141
Baseline dyspareunia	−1.29 (−3.27 to .68)	.202
Baseline PISQ-12 score	.24 (.09–.39)	.002
Mesh		
Prolift + M	Ref.	-
Exair	.01 (−2.5 to 2.52)	.994
Restorelle	.98 (−1.12 to 3.09)	.363
Concomitant procedures		
None	Ref.	
Sling	−1.03 (−2.96 to .89)	.295
Anal sphincteroplasty	−4.84 (−8.42 to −1.25)	.010
Both	−.98 (−4.57 to 2.61)	.595
Preoperative prolapse stage		
II	Ref.	-
III	.56 (−1.78 to 2.90)	.643
IV	−.02 (−2.67 to 2.62)	.986
Mesh procedure		
Posterior only	Ref.	-
Total	−1.50 (−3.51 to .50)	.144

PISQ-12 = Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire short form.

standpoint, there was no difference between vaginal mesh surgery and vaginal native tissue surgery. Thus, although mesh is not presently available for vaginal placement, these results still apply for any type of vaginal surgery for prolapse. Future well-powered research using mesh should not only investigate long-term efficacy and safety but must also include a careful assessment of sexual function.

Our study has several strengths. We analyzed a large group of women who underwent a similar type of pelvic reconstructive surgery. A validated self-reported questionnaire was used to assess various parameters of sexual function. Different types of pelvic mesh were used throughout the time period under review.

We acknowledge certain limitations including those inherent to a retrospective study. Other limitations include lack of a comparison group, low proportion (58%) with complete data for analysis at 12 months, and a relatively low baseline rate of sexual activity (31%), although this rate was similar as reported by Altman et al[8] (40%). Unfortunately, we did not collect any baseline information regarding subjects' reasons for not being sexually active, and this information would be important in determining the impact of POP on sexual function. For future research, we shall consider using the International Urogynecological Association—revised (PISQ-IR)[20] questionnaire, a modification of the PISQ by the International Urogynecological Association that accounts for those who are sexually inactive. In regard to the low follow-up rate, not all subjects during the study period completed the postoperative PISQ-12, so this limited the data available for analysis. Unfortunately, our sample size was too small to directly compare different mesh products. In addition, because the products studied are no longer manufactured, our results may not be applicable to future surgeries involving vaginal mesh unless similar products are used. Finally, despite our low mesh exposure rate at follow-up (with subjects following up over 2 years and information from the most recent visit recorded), it is possible that some subjects had exposures that were previously treated, so our overall rate of mesh exposure could not be determined.

Although recent studies have placed more emphasis on patient-related outcomes and quality-of-life changes along with anatomic cure, future studies should specifically assess the impact of both POP and POP surgery on all aspects of sexual function and not just dyspareunia, which is also inconsistently reported. Preoperative and postoperative dyspareunia rates, including *de novo* dyspareunia, should be carefully reported and analyzed to determine if associated with the surgical intervention or another etiology. Moreover, overall sexual function may still be affected despite a satisfied patient if the partner has negative feelings after POP surgery.

CONCLUSIONS

In conclusion, transvaginal mesh surgery for prolapse repair appears to show a positive impact on sexual function 12 months

Table 6. Multivariate regression analysis

	Regression coefficient (95% CI)	*P*
Age	−.1 (−.23 to .04)	.166
Menopause	−.13 (−3.78 to 3.52)	.946
Parity	−.05 (−.82 to .72)	.904
Baseline pelvic pain	1.94 (−.27 to 4.15)	.090
Baseline dyspareunia	.07 (−2.28 to 2.41)	.956
Baseline PISQ-12 score	.31 (.12 to .5)	.002
Mesh		
Prolift + M	Ref.	-
Exair	.32 (−2.85 to 3.49)	.844
Restorelle	1.73 (−.71 to 4.18)	.169
Concomitant procedures		
None	Ref.	-
Sling	.09 (−2.16 to 2.34)	.937
Anal sphincteroplasty	−5.1 (−9.19 to −1.02)	.017
Both	1.36 (−2.5 to 5.21)	.493
Preoperative prolapse stage		
II	Ref.	-
III	−.71 (−3.87 to 2.45)	.661
IV	−.35 (−4.45 to 3.75)	.868
Mesh procedure		
Posterior only	Ref.	-
Total	−.17 (−3.19 to 2.86)	.914

PISQ-12 = Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire short form.

after surgery. There is likely a place for transvaginal mesh to still be used to treat certain high-risk patients with a higher likelihood of failure if only native tissue surgery is performed. We intend to conduct future prospective studies using transvaginal mesh to treat POP to better understand the impact of this particular surgery on sexual function.

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STATEMENT OF AUTHORSHIP

Salil Khandwala, Conceptualization, Methodology, Project administration, Supervision, Validation, Writing - original draft, Writing - review & editing; Jason Cruff, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing - original draft, Writing - review & editing; Cheau Williams, Data curation, Investigation, Methodology, Writing - review & editing.

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