Sexual Satisfaction Changes Reported by Men After Their Partners' Robotic-Assisted Laparoscopic Sacrocolpopexies

Patrick J. Culligan, MD, Sean Haughey, BA,† Christa Lewis, MD,‡ Jennifer Priestley, PhD,§ and Charbel Salamon, MD‡*

Objectives: This study aimed to compare the preoperative and postoperative sexual satisfaction reported by male sexual partners of women undergoing surgical correction of pelvic organ prolapse.

Methods: This was a single-center prospective cohort study. Heterosexual, sexually active English-speaking couples in which the women were planning to undergo robotic-assisted laparoscopic sacrocolpopexy for correction of pelvic organ prolapse were eligible for enrollment in the study. Validated sexual function questionnaires—the Sexual Experience Questionnaire (SEX-Q; Mulhall et al. *J Sex Med*. 2008) and Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire-12 (Rogers, et al. *Int Urogynecol J Pelvic Floor Dysfunct*. 2003)—were used to evaluate preoperative and postoperative male and female sexual experience, respectively. These preoperative scores were compared using paired *t* tests. The Student *t* and the Mann-Whitney tests were used to compare study-eligible couples with noneligible couples and to compare study participants with nonparticipants.

Results: During the study enrollment period, 92 couples met the inclusion criteria and 45 of those were enrolled. Complete data sets of preoperative and postoperative questionnaires were obtained for 36 couples. After their partners' successful reconstructive surgery, male study subjects reported improved total SEX-Q scores (mean ± SD, 71 ± 16.7 vs 76.5 ± 17.8; $P = 0.025$). Within the subscales of the SEX-Q, there was significant improvement between preoperative and postoperative "individual satisfaction" scores (mean ± SD, 65.7 ± 16.8 vs 78.9 ± 17.5; $P < 0.0001$), but not within the "erectile dysfunction" or "couple satisfaction" subscales. Female partners reported improved Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire-12 scores after surgery (mean ± SD, 36.6 ± 5.5 vs 40.0 ± 4.6; $P = 0.003$).

Conclusions: Sexually active heterosexual men and women reported improved sexual experience after successful prolapse repair.

Key Words: pelvic organ prolapse, robotic-assisted laparoscopic sacrocolpopexy, sexual function, male sexual satisfaction

(*Female Pelvic Med Reconstr Surg* 2019;25: 365–368)

Among adults in the United States who describe themselves as sexually active, up to 43% of women and 31% of men report sexual dysfunction.[1] Women with symptomatic pelvic organ prolapse (POP) often experience sexual dysfunction related to physical factors such as feeling a vaginal bulge or fear of their partners' reactions to their anatomic changes.[2] Although most of these women are known to experience improved sexual function after successful POP repair,[2,3] very little is known about the effects that their reconstructive surgery may have on their male partners' sexual function and satisfaction.[4] Therefore, the main objective of this study was to compare the reported sexual function and satisfaction preoperative and postoperatively among the male sexual partners of heterosexual, sexually active women after pelvic reconstructive surgery. For completeness sake, we also compared the preoperative and postoperative Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire-12 (PISQ-12) scores of the women in these couples.

MATERIALS AND METHODS

This was an institutional review board–approved (AHSR09-08-008) single-center prospective cohort study listed in clinicaltrials.gov (NCT01320631) before any subject recruitment. During 12 consecutive months, all English-speaking women at least 18 years of age planning to undergo robotic-assisted laparoscopic sacrocolpopexy at our center for stage II–IV symptomatic POP were screened for enrollment eligibility. We excluded women who reported that they were not sexually active or who reported a recent history of their partners' erectile dysfunction. In an effort to standardize our study group and limit confounding, we also excluded couples in which the women chose surgical approaches other than robotic-assisted laparoscopic sacrocolpopexy for correction of their POP. Other exclusion criteria were intraoperative conversion to another POP repair and discontinuation of sexual activity between the 2 partners for some reason unrelated to the surgery after enrollment. All surgeries were performed by fellowship-trained attending urogynecologists using our previously reported standardized techniques.[5,6]

Couples signed informed consent documents before study enrollment—on the same day that the surgical informed consent documents were signed—and then filled out a validated male and female sexual function questionnaires. The male questionnaire was called the Sexual Experience Questionnaire (SEX-Q),[7] and it was completed at preoperative "baseline" and again 6 months postoperatively. The SEX-Q is a validated male sexual experience questionnaire that contains 12 questions and is divided into 3 domains: erectile function, individual satisfaction, and couple satisfaction.[7] Each question is scored on a 5-point Likert scale, ranging from 1 to 5. Raw scores are transformed to a 0–100 scale, with higher scores indicative of better sexual experience. Total preoperative and postoperative scores for the SEX-Q were compared, as were the domain scores. The 3 domain scores of the SEX-Q were key secondary end points. We chose the SEX-Q as our outcome measure, because at the time of study initiation, we felt that it was the most relevant male sexual function questionnaire available. The questions included within the SEX-Q are listed in Figure 1. These preoperative SEX-Q questionnaires were filled out by the male partners on the day of surgery. We recommend refraining from intercourse for 6 weeks after surgery; we chose the 6-month time

From the *Department of Urology, Weill Cornell Medicine Center for Female Pelvic Health, New York, NY; †University of Virginia School of Medicine, Charlottesville, VA; ‡Atlantic Urogynecology Associates, Morristown, NJ; and §Department of Statistics and Analytical Sciences, Kennesaw State University, Kennesaw, GA.

Correspondence: Patrick J. Culligan, MD, Center for Female Pelvic Health, 525 E 68th St, New York, NY 10065. E-mail: pjc9007@med.cornell.edu.

Clinicaltrials.gov reference: NCT01320631 https://clinicaltrials.gov/ct2/show/NCT01320631?term=NCT01320631&rank=1

Dr. Salamon is a paid instructor for Intuitive Surgical. Dr Culligan is a paid consultant for Intuitive Surgical and Coloplast and stockholder of Origami Surgical, LLC. The other authors have no disclosures.

Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.

DOI: 10.1097/SPV.0000000000000574

Copyright © 2019 Wolters Kluwer Health | Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

Over the past 4 weeks,

1. How often were you able to maintain an erection for as long as you wanted to?
2. During sexual intercourse,how often were you able to penetrate your partner?
3. How much have you worried about whether you could get an erection?
4. How confident were you that you could get an erection when you wanted to?
5. How satisfied were you with the hardness of your erections?
6. How satisfied were you with the duration of your erections?
7. How satisfied were you with your level of sexual desire?
8. How satisfied were you with your overall sexual activity?
9. How much pleasure did you get from sexual activity?
10. How confident were you that you could satisfy your partner during sexual activity?
11. How often did you achieve mutual satisfaction with your partner?
12. How satisfied were you with your ability to control the timing of your ejaculations?

The erection domain of the SEX-Q is described by items 1–6, the individual satisfaction domain by items 7–9, and the
couple satisfaction domain by items 10–12.

FIGURE 1. Questions within the SEX-Q.

frame for collection of our postoperative measures so as to give ample time for resuming sexual relations.

Each female study patient underwent our standard comprehensive preoperative and postoperative urogynecologic evaluation including POP quantification (POP-Q) examination[8] and administration of the Pelvic Floor Distress Inventory-20.[9] The female study questionnaire was a prolapse/urinary incontinence–specific sexual function questionnaire (PISQ-12)[2] also completed at baseline and at the 6-month postoperative interval. The PISQ-12 is a condition-specific validated sexual function questionnaire divided into 3 domains; behavioral emotive, physical, and partner related. The PISQ-12 questions specifically address sexual desire, ability to be aroused and experience orgasm, satisfaction with sexual variety, pain, urinary incontinence and fear of urinary or fecal incontinence during sex, avoidance of intercourse because of prolapse, emotional response to sexual activity, partner sexual dysfunction, and intensity of orgasm. Individual questions are scored on a 5-point scale. Total scores range from 0 to 48, with higher scores being indicative of better sexual function.

Female study patients' demographic information was collected including age, body mass index (BMI), vaginal parity, hormonal replacement status, prior hysterectomy, prior prolapse surgery, and whether concomitant perineorrhaphy and/or suburethral sling placement was performed with the index operation. We did not collect demographic information from the male sexual partners of our female patients; we wanted to preserve the perception of anonymity of the male participants.

Surgical results at 6 months were assessed via the POP-Q, with each female patient classified as having either "optimal" or "suboptimal" results at that postoperative interval. To be classified as having an "optimal surgical result" at 6 months, all of the following criteria had to be met: no complaints of prolapse symptoms on PDFI-20, no complaints of dyspareunia, POP-Q point C at −7 or better, and points Ba and Bp both less than −1.

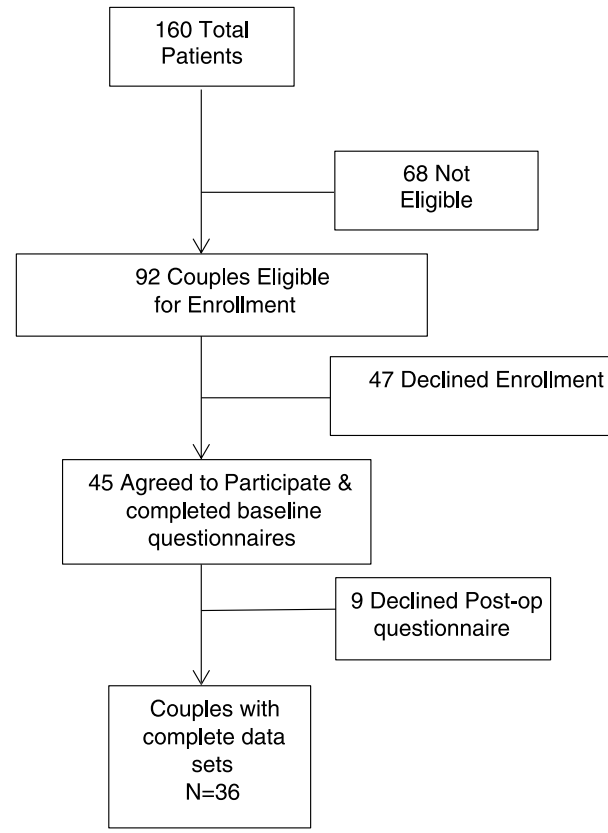

FIGURE 2. A flow diagram describing the study group.

© 2018 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2019 Wolters Kluwer Health | Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

TABLE 1. Comparison of Female Patients Who Were Eligible and Noneligible for Study Participation

	Eligible Female Patients (n = 92), Mean ± SD	Noneligible Female Patients (n = 68), Mean (SD)	*P*	95% CI
Age, y	53.6 ± 8.3	59.3 ± 9.3	<0.0001	−2.9 to −8.5
BMI, kg/m^2	25.1 ± 4.1	26.9 ± 4.3	0.006	−0.5 to −3.2
Vaginal parity	2.3 ± 0.9	2.6 ± 1.1	0.30	0.02 to −0.6
Prolapse stage*	2.5 ± 0.5	2.6 ± 0.6	0.21	0.4 to −0.3

*Mann Whitney test.
CI, confidence interval.

Postoperative dyspareunia was assessed for women using PISQ-12 question 5, with responses of 0 or 1 dichotomized as "no dyspareunia" and responses of 2–5 as "dyspareunia."

Demographics for all female patients undergoing robotic-assisted laparoscopic sacrocolpopexy at our center during the study enrollment period were analyzed to find any potential differences between eligible and noneligible female study patients or between participating and nonparticipating female patients who were eligible.

We added 2 nonvalidated questions for the male partners to answer at the 6-month postoperative interval: "Do you feel anything scratching your penis during penetration?" and "What effect did your partner's recent vaginal surgery have on your enjoyment of sexual intercourse?" The "scratching of the penis" question was scored as a simple "yes" or "no." The question addressing the effect that recent surgery had on overall enjoyment of sexual intercourse was scored on a Likert scale from 0 to 5 for answers of "much worse" or "worse," "no effect," "better," or "much better," but we dichotomized their answers by considering scores of 1 to 3 as "no improvement or worsened" and scores of 4 to 5 as "improvement." We added these 2 nonvalidated questions because the SEX-Q does not address these specific issues.

Based on the mean total SEX-Q score of 33 ± 17.4 in the original SEX-Q publication,[7] our sample size estimates called for 31 male subjects to have an 80% power to detect a 25% (ie, 0.5 SD) difference in the preoperative vs postoperative total SEX-Q scores with a 2-tailed α of 0.05. Because we expected significant attrition at the 6-month interval, we sought to enroll 45 sexually active couples.

Statistical analysis was performed using SAS 9.2 (SAS Institute Inc, Cary, NC). Demographics were assessed with descriptive statistics using standard methods. Comparisons of study group vs nonparticipant characteristics including age, BMI, parity, and POP-Q stage were assessed using Student *t* tests as appropriate. Changes between preoperative and postoperative SEX-Q and PISQ-12 scores were compared using paired *t* tests. The Student *t* and the Mann-Whitney tests were used to compare study-eligible couples with noneligible couples and to compare study participants with nonparticipants.

RESULTS

During the 12-month time of enrollment, 160 women underwent robotic-assisted laparoscopic sacrocolpopexy at our center. Of those, 92 (57.5%) reported being heterosexual and sexually active with a male partner who did not experience erectile dysfunction. A total of 47 couples declined enrollment, leaving us with a study group of 45 couples who completed their preoperative questionnaires. However, 9 of these couples never returned their postoperative questionnaires, leaving us with complete data sets for 36 couples (Fig. 2). Only 2 characteristics were statistically different between the eligible and noneligible female patients who underwent robotic sacrocolpopexy during our study interval. Eligible female patients were significantly younger and had a lower BMI (Table 1). There were no other demographic differences between these groups. Similarly, when compared with female study participants, female patients who declined enrollment were younger and had a lower BMI (Table 2).

All 36 female patients were classified as having optimal surgical results at their 6-month examinations based on the previously mentioned criteria. None of the female patients in our study had surgical complications. Furthermore, all of the female patients in this study experienced successful long-term outcomes of their robotic-assisted laparoscopic sacrocolpopexies. In fact, all of these female patients had 12-month subjective and objective results and had been included in our previous publications of robotic-assisted laparoscopic sacrocolpopexy using lightweight Y-mesh[5,6] and were therefore not duplicated for this article.

Table 3 includes the detailed comparisons of preoperative and postoperative SEX-Q and PISQ-12 scores. Total SEX-Q scores improved after surgery, driven by a very significant improvement in the "individual satisfaction" subscale. As expected, total postoperative PISQ-12 scores improved significantly compared with preoperative scores.

TABLE 2. Comparison of Female Participants vs Nonparticipants

	Study Participants (n = 45), Mean ± SD	Nonparticipants (n = 47), Mean ± SD	*P*	95% CI
Age, y	52.6 ± 8.3	54.6 ± 8.4	0.24	1.4 to −5.5
BMI, kg/m^2	24.8 ± 4.1	25.4 ± 4.2	0.049	1.1 to −2.3
Vaginal parity	2.3 ± 0.9	2.3 ± 1.0	0.94	0.4 to −0.4
Prolapse stage*	2.5 ± 0.5	2.5 ± 0.5	0.76	0.2 to −0.2

*Mann Whitney test.
CI, confidence interval.

© 2018 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2019 Wolters Kluwer Health | Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

TABLE 3. Sex-Q* and PISQ-12 Results

	Preoperative (n = 36), Mean ± SD	Postoperative (n = 36), Mean ± SD	*P*	95% CI
SEX-Q total score	71.0 ± 16.7	76.5 ± 17.8	0.025	−0.5 to −5.7
ED	78.0 ± 19.2	80.2 ± 20.8	0.74	3.3 to −4.7
IS	65.7 ± 16.8	78.9 ± 17.5	<0.0001	−7.6 to −16.5
CS	62.4 ± 21.9	66.7 ± 21.7	0.54	4.0 to −7.7
PISQ-12 total score	36.6 ± 5.5	40.0 ± 4.6	0.003	−4.3 to −7.5

*Note that the transformed scores are used in this analysis: (100 × (Average of relevant items − 1))/4.

CS, "couple satisfaction" subscale; ED, "erectile dysfunction" subscale; CI, confidence interval; IS, "individual satisfaction" subscale.

No female patient experienced mesh erosion or exposure during the study period, and no male partner reported any sensation of something scratching the penis during intercourse. Nearly all of the male partners (34/36) reported that their partners' surgery had improved their own enjoyment of sexual intercourse. None of the female patients reported dyspareunia.

DISCUSSION

Within our study group of sexually active heterosexual couples, sexual satisfaction improved for both the men and women after successful POP repair via robotic-assisted laparoscopic sacrocolpopexy. Strengths of this study include our prospective cohort study design, the use of validated questionnaires for our primary outcome measures, the uniform nature of our surgical techniques, and that we fulfilled our prospective sample size goals. Weaknesses of this study include possible poor generalizability to other centers and/or other POP repair techniques, our use of 2 nonvalidated questions to assess the male partners' specific satisfaction with intercourse and whether they felt anything scratching their penises, and the relatively small study size. Although we enrolled enough patients to meet our needs derived from our power calculations, the clinical significance of the improved SEX-Q scores is not known. There is no published threshold for minimum clinically important difference for the SEX-Q. Other questionnaires validated since the start of our study may be more appropriate for future research on this topic. Our results may only be relevant to the subpopulation of women who experience successful reconstructive surgery.

Nevertheless, we are encouraged to report these data showing improved sexual function and satisfaction among male heterosexual partners of women who underwent repair via robotic-assisted laparoscopic sacrocolpopexy.

REFERENCES

1. Laumann E, Paik A, Rosen R. Sexual dysfunction in the United States: prevalence and predictors. *JAMA* 1999;281(6):537–544.
2. Rogers RG, Coates KW, Kammerer-Doak D, et al. A short form of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12). *Int Urogynecol J Pelvic Floor Dysfunct* 2003;14:164–168.
3. Salamon CG, Lewis CM, Priestley J, et al. Sexual function before and 1 year after laparoscopic sacrocolpopexy. *Female Pelvic Med Reconstr Surg* 2014; 20(1):44–47.
4. Kuhn A, Brunnmayr G, Stadlmayr W, et al. Male and female sexual function after surgical repair of female organ prolapse. *J Sex Med* 2009;6:1324–1334.
5. Culligan PJ, Gurshumov E, Lewis C, et al. Subjective and objective results 1 year after robotic sacrocolpopexy using a lightweight Y-mesh. *Int Urogynecol J* 2014;25(6):731–735.
6. Salamon CG, Lewis C, Priestley J, et al. Prospective study of an ultra-lightweight polypropylene Y mesh for robotic sacrocolpopexy. *Int Urogynecol J* 2013;24(8):1371–1375.
7. Mulhall JP, King R, Kirby M, et al. Evaluating the sexual experience in men: validation of the Sexual Experience Questionnaire. *J Sex Med* 2008;5: 365–376.
8. Bump RC, Mattiasson A, Bø K, et al. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. *Am J Obstet Gynecol* 1996;175:10–17.
9. Barber MD, Walters MD, Bump RC. Short forms of two condition-specific quality-of-life questionnaires for women with pelvic floor disorders (PFDI-20 and PFIQ-7). *Am J Obstet Gynecol* 2005;193:103–113.

© 2018 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2019 Wolters Kluwer Health | Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.