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Sexual Function Before and After Sacrocolpopexy for Pelvic Organ Prolapse

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Abstract

Objective—To describe sexual function before and after sacrocolpopexy.

Study design—In the Colpopexy and Urinary Reduction Efforts trial, sexual function was assessed in 224 women with sexual partners before and 1 year after surgery using validated questionnaires.

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Condensation One year after sacrocolpopexy, more women were sexually active than before surgery and significantly fewer women report sexual interference from pelvic floor symptoms or dyspareunia.

In addition to the authors, the following Pelvic Floor Disorders Network Members participated in the CARE trial:

University of Alabama at Birmingham, Birmingham, Alabama – K. Burgio, P. Goode, R. Varner, V. Willis

Baylor College of Medicine, Houston, Texas – P. Fine, P. Thompson, P. Lotze, N. Frierson

University of Iowa, Iowa City, Iowa – D. Brandt, D. Haury, K. Kreder, C. Bradley

Johns Hopkins Medical Institutes, Baltimore, Maryland – G. Cundiff, M. Sauter

Loyola University, Chicago, Illinois – M. FitzGerald, K. Kenton, D. Koch, C. Ball

University of Michigan, Ann Arbor, Michigan – J. Wei, J. DeLancey, D. Smith, J. Imus, B. Marchant, Y. Casher

University of North Carolina at Chapel Hill, Chapel Hill, North Carolina – A. Visco, A. Connolly, M. Jannelli, M. Loomis, A. Murphy, E. Wells, W. Whitehead

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Results—After surgery, significantly fewer women reported sexual interference from “pelvic or vaginal symptoms” (32.5% one year after surgery versus 7.8% prior to surgery), fear of incontinence (10.7% versus 3.3%), vaginal bulging (47.3% versus 4.6%), or pain (39.9% versus 21.6%). The proportion of women with infrequent sexual desire (32%) did not change. More women were sexually active 1 year after surgery (171, 76.3%) than before surgery (148, 66.1%). The 11 women (7.4%) who became sexually inactive were more likely than sexually active women to report infrequent sexual desire (70.05% versus 22.1%, $p < 0.001$). The addition of Burch colposuspension did not impact postoperative sexual function.

Conclusions—After sacrocolpopexy, most women reported improvements in pelvic floor symptoms that previously interfered with sexual function. These improvements were not impacted by concomitant Burch colposuspension.

Keywords

sacrocolpopexy; sexual function; genital prolapse

INTRODUCTION

Sexual function in women is multifactorial and is affected by psychological, sociological, environmental and physical factors. Abnormal sexual function is difficult to define, with sexual dysfunction as high as 43% in the United States¹. While various medical conditions negatively impact sexual function, our ability to predict how certain conditions do affect sexual function is poor².

Intuitively, pelvic organ prolapse would seem likely to adversely impact sexual function, potentially by causing discomfort, urinary incontinence, or embarrassment during sexual activity. In fact, there is some evidence that advanced prolapse negatively affects sexual function^{3,4}. However, older age and postmenopausal status, common in women with prolapse, are also associated with sexual dysfunction⁵ and may confound the association between prolapse and sexual function. In one study of 80 women with pelvic floor disorders and 30 controls⁶, advancing age predicted poorer sexual function. Controlling for age, global sexual function was similar for women with pelvic floor disorders and controls⁶. In another study, sexual function and urinary incontinence were both improved 3–6 months after surgery for urinary incontinence and/or prolapse, suggesting that sexual function can improve with surgical treatment of incontinence⁷.

Much of the sparse data about sexual function in women with prolapse is limited by the use of non-validated outcome measures^{6,8,9}. Some studies of the impact of surgical intervention have also been limited by an absence of baseline data¹⁰. This research was based on data from the Colpopexy and Urinary Reduction Efforts (CARE) study^{11,12}, a randomized clinical trial of Burch colposuspension versus no Burch at the time of sacrocolpopexy. The CARE trial provides a unique opportunity to investigate sexual function in a well-characterized group of women with clinically significant prolapse. Using validated measures to assess prolapse and sexual function, we studied sexual function at baseline and 1 year after surgery.

The aims of this analysis were to: 1) characterize the baseline prevalence of sexual activity in women before sacrocolpopexy for prolapse, 2) compare baseline characteristics of women with partners who were or were not sexually active before surgery, 3) describe the condition-specific sexual complaints, and 4) compare sexual activity before and 1 year after surgery.

MATERIAL AND METHODS

The CARE trial methods have been previously reported¹¹ and relevant details are summarized here. Eligible participants were stress-continent women planning abdominal sacrocolpopexy for stage II–IV prolapse. Data for this analysis were obtained at the preoperative and 1-year assessment points. Participants provided oral and written consent for participation in this trial. Institutional Review Board approval was obtained by all clinical sites and the data coordinating center.

Participants completed a standardized physical examination and interview before randomization to surgical groups. Prolapse was staged using the Pelvic Organ Prolapse Quantification (POP-Q) system, a standardized quantitative method of prolapse assessment¹³. At enrollment, all women were categorized as stress continent on the basis of their responses of "never" or "rarely" to six questions regarding symptoms of stress incontinence of the Medical, Epidemiological, and Social Aspects of Aging (MESA) questionnaire¹⁴.

Telephone interviews were performed at baseline and 1 year after surgery. Trained female interviewers from the Quality of Life Telephone Interviewing Center at the University of Michigan administered these interviews, which included generic and condition-specific measures of health status and health-related quality of life, and pelvic floor symptoms. Participants were also asked "In the past 3 months, have you engaged in sexual activities with a partner?" The phrase "sexual activity" was not otherwise defined. Those who had not been sexually active with a partner were asked "Do you have a partner at this time?" Our analysis was limited to the subset of women who had a sexual partner at baseline and 1 year after index surgery.

Among those who were sexually active, sexual function was assessed with the short form Pelvic Organ Prolapse/Urinary Incontinence Sexual Functioning Questionnaire (PISQ-12),^{3, 15, 16} which has been validated in sexually active heterosexual women³. The PISQ-12 includes 12 questions about 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. Scores range from 0 to 48, with higher scores indicating better sexual function. For analysis, PISQ responses were considered negative for "seldom" or "never" and positive for "sometimes", "usually" or "always." Infrequent sexual desire was defined as responses of "seldom" or "never."

We were interested in identifying reasons why some women with sexual partners did not engage in sexual activity. Therefore, women who had not engaged in sexual activity with a partner in the preceding 3 months were asked four questions selected from the PISQ-12 (see appendix). These four items address desire, satisfaction with variety of sexual activity, fear of incontinence that restricted sex, and avoiding sex because of a bulge. In addition, these women were asked if "fear of pain during sexual intercourse restricts your activity".

Baseline demographic and clinical variables were analyzed to identify possible factors associated with abstaining from sexual activity. Age, race, marital status, educational attainment, and menopause status were self-reported at enrollment. Because both Burch colposuspension and posterior colporrhaphy have been associated with postoperative dyspareunia,^{8, 9} the potential impact of those procedures on postoperative sexual function was analyzed. In the CARE trial, concomitant Burch was randomly assigned at the time of sacrocolpopexy and posterior colporrhaphy was performed at the discretion of the surgeon¹¹.

Proportions were compared using Fisher's exact test. Group means were compared by a two-sample t-test. Since the data were collected centrally by telephone interview, we did not adjust analyses by clinical site. Paired t-tests and McNemar's test were used to compare changes from baseline to 1 year. All statistical tests were two-tailed using an alpha of 0.05.

RESULTS

Of 322 women who participated in the CARE trial, 288 (89.4%) completed the 1-follow-up. Of these, the 224 women (77.8%) who had a sexual partner both before and after surgery form our study population.

At baseline, sexually active women were younger, less likely to be postmenopausal, and less likely to have stage IV prolapse than women who were not sexually active (Table I). Other characteristics, including race, body mass index (BMI), marital status, smoking, medical comorbidities, and previous surgery for prolapse or urinary incontinence did not differ significantly between sexually active and not sexually active women.

Before sacrocolpopexy, 68 women (30.4%) reported that pelvic or vaginal symptoms affected sexual relations (Table II). This complaint was less common among sexually active women (25.7%) than among those who were not sexually active (46.2%; $p=0.004$). Infrequent sexual desire was also less common among sexually active women (24.3%) than among those who did not engage in sexual relations (46.7%; $p=0.001$). There were no statistically significant differences between women who were or were not sexually active in the percentage of women who avoided sex because of bulging in the vagina (45.3% versus 52.6%, $p=0.32$) or for fear of urinary incontinence (10.1% versus 10.7%, $p=1.0$). At enrollment, almost half (65, 43.9%) of the sexually active women reported that intercourse was limited by pain, while more than one-quarter (22, 29.3%) of those who did not engage in sex reported that fear of pain restricted their sexual activity ($p=0.04$).

One year after sacrocolpopexy (Table III), the number of sexually active women rose significantly, from 148 (66.1%) to 171 (76.3%). The number of women who avoided sex because of vaginal bulging decreased from 103 (47.3%) to 10 (4.6%), and significantly fewer women reported interference with sex from "pelvic or vaginal symptoms" or fear of incontinence. Intercourse was limited by pain for 60 women before surgery and 35 (58%) of these reported they did not have dyspareunia after surgery. Eleven of the 76 (14.5%) women who did not report pain limiting intercourse before surgery reported pain one year after sacrocolpopexy, regardless of concomitant Burch colposuspension. The proportion of women with infrequent sexual desire did not change after surgery. Among sexually active women, the proportion of women who felt sexually excited during sexual activity with a partner didn't change substantially (85% before surgery versus 91% one year after surgery, $p=0.06$). There was no significant change in the proportion of women reporting orgasm with intercourse (71% before surgery versus 79% after surgery, $p=0.10$). Finally, among women who were sexually active before and after surgery, mean PISQ-12 score improved significantly (34.1 ± 6.8 to 37.3 ± 5.2 , $p<0.001$).

Comparing 110 women randomized to Burch colposuspension versus 114 women in the non-Burch group, we did not find a significant difference in the proportion of sexually active women 1 year after surgery (78.2% versus 75.4%, $p=0.53$). In sexually active women, those in the Burch group were not more likely than women in the non-Burch group to report dyspareunia 1 year after surgery (20 of 86, 23.2% versus 20 of 84, 23.8%, $p=1.0$). Mean PISQ-12 scores among sexually active women did not differ between the Burch versus non-Burch groups (37.2 ± 5.4 versus 37.4 ± 5.1 , $p=0.82$).

We investigated the role of concomitant hysterectomy on post-sacrocolpopexy sexual function by comparing the 64 women who had concomitant hysterectomy to 160 women who did not have concomitant hysterectomy (almost all of whom had prior hysterectomy). Women who had a concomitant hysterectomy were more likely to be sexually active 1 year after surgery (86% versus 73%, $p=0.04$). Also, at one year, there was no difference in the rates of dyspareunia between sexually active women with concomitant hysterectomy and those without concomitant hysterectomy (17 of 55, 31% with concomitant hysterectomy, versus 23 of 115, 20% without hysterectomy, $p=0.13$). Mean PISQ-12 scores did not differ between these groups (38.2 ± 4.5 versus 37.1 ± 5.4 , $p=0.18$).

We also examined the impact of posterior repair performed in 70 women. The proportion of sexually active women at one year was similar in women with and without posterior repair at the time of sacrocolpopexy (51 of 70 with repair [72.8%] versus 120 of 154 without repair [77.9%], $p=0.40$). Mean PISQ-12 scores in women with and without posterior repair were not significantly different after surgery (37.4 ± 5.3 versus 37.3 ± 5.2 , $p=0.95$). More women who underwent posterior repair reported postoperative dyspareunia, although the difference did not reach statistical significance (17 of 51 [33.3%] versus 23 of 119 [19.3%], $p=0.07$). The combination of Burch and posterior repair was not associated with a further increase in dyspareunia; this complaint was reported by 7 of 23 (30.4%) women after posterior repair and Burch, compared to 10 of 28 (35.7%) after posterior repair alone. Likewise, in women without posterior repair, Burch did not affect dyspareunia, which was reported by 13 of 63 (20.6%) women after Burch, compared to 10 of 56 (17.8%) women with neither Burch nor posterior repair.

Overall, 34 of 76 (44.7%) women who were not sexually active before surgery became sexually active after surgery. The preoperative symptom of avoiding intercourse because of “bulging in the vagina” was strongly associated with resumption of sexual activity after surgery. This symptom was reported by 40 of 76 (52.6%) women who were sexually inactive before surgery; of these, 27 (67.5%) reported sexual activity 1 year after surgery. In contrast, only 7 of 36 (19.4%) women without this symptom preoperatively became sexually active after surgery.

Only 11 of 148 (7.4%) women who were sexually active before surgery became sexually inactive after surgery. These women did not differ in age or preoperative prolapse severity from women who continued sexual activity after surgery. None of the women who became sexually inactive reported postoperative sexual interference from fear of incontinence or vaginal bulging. Comparing postoperative symptoms of women who became sexually inactive after sacrocolpopexy with those who continued sexual activity, the proportion of women with intercourse limited by pain was similar (22% versus 26%, $p=1.0$). However, more women who became sexually inactive after surgery, compared to those who remained sexually active, reported infrequent sexual desire after surgery (7 of 10 [70.0%] versus 30 of 136 [22.1%], $p<0.001$).

COMMENT

The importance of sexual function as a surgical outcome has been recognized by a growing number of surgical investigators, including Paraiso¹⁷, Silva¹⁰, Shah¹⁸, and Glavind¹⁹. This study specifically investigated the impact of sacrocolpopexy and includes data from 224 patients originally enrolled in the CARE trial. The majority (66%) reported that they were sexually active prior to surgery. We found that many sexually active women experienced improvements in sexual function following sacrocolpopexy, including a reduction in pelvic floor symptoms and pain during intercourse. In addition, fewer women avoided sexual intercourse after surgery because of a vaginal bulge. While this improvement was anticipated, we did not predict such a substantial decrease in dyspareunia. The high prevalence of

dyspareunia before surgery was also unexpected. The number of women in this study who reported that intercourse was limited by pain dropped substantially after surgery, suggesting that preoperative dyspareunia may have been related to prolapse. However, we cannot exclude other causes of dyspareunia. Nevertheless, the observed resolution of dyspareunia with sacrocolpopexy should be reassuring to sexually active women considering sacrocolpopexy.

Following surgery, 34 of 76 (44.7%) who had not been sexually active before sacrocolpopexy became sexually active. As might be expected, resumption of sexual activity after surgery was associated with a preoperative complaint of avoiding intercourse because of “bulging in the vagina.” Women who underwent a concomitant hysterectomy were more likely to be sexually active one year after surgery, but we suspect that this finding is confounded by the older mean age of women with prior hysterectomy.

In contrast, a much smaller number of sexually active women stopped sexual activity following surgery. Most women who became sexually inactive after surgery had infrequent sexual desire. The overall proportion of women with infrequent sexual desire did not change with surgery. Unfortunately, there is a dearth of information on female sexual desire in general and particularly with regard to the impact of gynecologic surgery. Further research on sexual desire, and other aspects of sexual function, is sorely needed in women with and without prolapse, and before and after surgery.

There was no increase in dyspareunia after the Burch procedure. Improvement in dyspareunia has been reported after the combination of Burch and sacrocolpopexy²⁰. However, because Burch was randomly assigned in the CARE trial, we are able to examine the impact of sacrocolpopexy alone versus Burch plus sacrocolpopexy. The random assignment of Burch reduces the possibility that women who underwent Burch differed from the non-Burch group in other factors that could influence sexual function. Thus, our assessment of the effect of Burch on sexual function is unlikely to be biased by the other characteristics of these women. This finding should be reassuring to clinicians planning Burch colposuspension at the time of sacrocolpopexy for sexually active women.

In contrast, posterior repair was not randomly assigned but instead was performed at the discretion of the surgeon. Therefore, the decision to perform posterior repair could have been associated with factors that also put women at increased risk of postoperative dyspareunia. We found that dyspareunia was more prevalent after posterior repair, although this finding was not statistically significant. This result is consistent with previous studies reporting that posterior colporrhaphy is associated with postoperative dyspareunia.^{8, 9} Further research is needed to understand the cause of dyspareunia in women with prolapse, and to improve resolution and prevent new dyspareunia in women after prolapse surgery.

Our study is strengthened by the use of a validated measure of sexual function, prospective data collection by research staff blinded to the subjects' randomized group assignment, and the geographical diversity of participating study sites. However, because sexual function was not a primary aim of the CARE trial, characterization of sexual function was limited. As with any questionnaire that asks participants to recall their experience, sexual activity responses over the past three months may have been affected by recall bias. Clinicians are cautioned regarding application of these results to women with prolapse and overt symptoms of stress incontinence, as the CARE trial focused on stress-continent women with prolapse.

Pelvic organ prolapse is known to impact body image²¹ and the impact on sexual function is not known. Although we did not assess body image, we plan to consider such assessments in future trials. The adaptive sexual practices of these women are not known and deserve further study. Further investigations of why women do or do not resume sexual activity after surgery may benefit from a combination of quantitative and qualitative research methods.

Our findings can be used in surgical counseling of women considering sacrocolpopexy. One year after surgery, the proportion of sexually active women increased, the proportion who avoided sex because of prolapse symptoms decreased, and the mean PISQ-12 scores improved. In addition, the addition of Burch colposuspension did not adversely influence sexual function. These results suggest that most sexually active women can expect to continue sexual activity following sacrocolpopexy and experience less impact from pelvic floor symptoms.

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Appendix

Questions for women who were not sexually active with a partner within the preceding 3 months (modified from PISQ-12)

C1. Do you have a partner at this time?

1	2
Yes	No

C2. How frequently do you feel sexual desire? This feeling may include wanting to have sex, planning to have sex, feeling frustrated due to lack of sex, etc.

1	2	3	4	5
Never	Seldom	Sometimes	Usually	Always

C3. On a 5-point scale where “1” indicates very satisfied and “5” indicates not at all satisfied, how satisfied are you with the variety of sexual activity in your current sex life?

Very Satisfied			Not at all Satisfied	
1	2	3	4	5

C4. Does fear of pain during sexual intercourse restrict your activity?

1	2	3	4	5
Never	Seldom	Sometimes	Usually	Always

C5. Does fear of incontinence (either stool or urine) during sexual intercourse restrict your sexual activity?

1	2	3	4	5
Never	Seldom	Sometimes	Usually	Always

C6. Do you avoid sexual intercourse because of bulging in the vagina (either the bladder, rectum or vagina falling out)?

1 Never	2 Seldom	3 Sometimes	4 Usually	5 Always
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Table 1

Characteristics of 224 women who completed 1 year follow up and who had a sexual partner both before and after sacrocolpopexy.

Characteristic (mean ± SD or N (%))	Before sacrocolpopexy		1 year after sacrocolpopexy	
	Sexually active (N=148)	Not sexually active (N=76)	Sexually active (N=171)	Not sexually active (N=53)
Age (years)	58.0±10.3	63.8±7.4	58.7±9.8	64.3±7.7
Caucasian race	141(95.3%)	69(90.8%)	161(94.1%)	49(92.5%)
BMI** (kg/m ²)	27.1±4.5	27.5±4.0	27.1±4.4	27.7±4.0
Married	131(89.7%)	70(92.1%)	151(89.4%)	50(94.3%)
Education more than high school	91 (61.5%)	31(40.8%)	101 (59.1%)	21(39.6%)
Postmenopausal	118(80.3%)	72(94.7%)	139(81.8%)	51(96.2%)
Prolapse stage (at baseline)				
• Stage II	20 (13.5%)	7 (9.2%)	22(12.9%)	5(9.4%)
• Stage III	110(74.3%)	50(65.8%)	123(71.9%)	37(69.8%)
• Stage IV	18 (12.2%)	19(25.0%)	26(15.2%)	11(20.8%)

* Comparison of women who were or were not sexually active before surgery.

† Comparison of women who were or were not sexually active one-year after surgery.

** BMI = body mass index

Table II

Preoperative sexual symptoms among 224 women who completed one year follow up and who had a sexual partner both before and after sacrocolpopexy.

Symptom	Sexually active (N=148)	Not sexually active (N=76)	P value [*]
Pelvic or vaginal symptoms affect ability to have sexual relations	38 (25.7%)	30 (46.2%)	0.004
Fear of incontinence restricts sexual function	15 (10.1%)	8 (10.7%)	1.0
Avoids sex because of bulging in the vagina	67 (45.3%)	40 (52.6%)	0.32
Intercourse limited by pain [†]	65 (43.9%)	22 (29.3%)	0.04
Sexual desire "seldom" or "never"	36 (24.3%)	35 (46.7%)	0.001

* P-values with Fisher's exact test

[†] Sexually active women were asked: "Do you feel pain with sexual intercourse?" Women who were not sexually active were asked: "Does fear of pain during sexual intercourse restrict your activity?"

Table III

Sexual activity and sexual function before and 1 year after surgery (n=224).

	Before sacrocolpopexy	One year after sacrocolpopexy	P value*
Sexually active	148 (66.1%)	171 (76.3%)	<0.001
"Pelvic or vaginal symptoms" interfere with sex	68 (30.4%)	16 (7.1%)	<0.0001
Fear of incontinence restricts sexual function	23 (10.3%)	7 (3.1%)	0.003
Avoid sex because of bulging in the vagina	107 (47.8%)	10 (4.5%)	<0.0001
Intercourse limited by pain	87 (38.8%)	47 (21.0%)	<0.0001
Frequency of sexual desire "seldom" or "never"	71 (31.7%)	71 (31.7%)	1.00

* P-values by McNemar's test