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Obesity and outcomes after sacrocolpopexy

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Abstract

OBJECTIVE—The purpose of this study was to compare outcomes after sacrocolpopexy (SC) between obese and healthy-weight women.

STUDY DESIGN—Baseline and postoperative data were analyzed from the Colpopexy And Urinary Reduction Efforts (CARE) randomized trial of SC with or without Burch colposuspension in stress continent women with stages II–IV prolapse. Outcomes and complications were compared between obese and healthy-weight women.

RESULTS—CARE participants included 74 obese (body mass index ≥30 kg/m^2), 122 overweight (25–29.9 kg/m^2), and 125 healthy-weight (18.5–24.9 kg/m^2) women, and 1 underweight (<18.5 kg/m^2) woman. Compared to healthy-weight women, obese women were younger (59.0 ± 9.9 vs 62.1 ± 10.3 yrs; P = .04), more likely to have stage II prolapse (25.7% vs 11.2%; P = .01), and had longer operative times (189 ± 52 vs 169 ± 58 min; P = .02). Two years after surgery, stress incontinence, prolapse, symptom resolution, and satisfaction did not differ between the obese and healthy-weight groups.

CONCLUSION—Most outcomes and complication rates after SC are similar in obese and healthy-weight women.

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Keywords

abdominal sacrocolpopexy; obesity; postoperative complications; surgical outcomes

Women 50–79 years of age are at highest risk for undergoing surgery for pelvic floor disorders, and more than one third of American women in this age range are obese.[1–3] Obese women are more likely to have both urinary incontinence and pelvic organ prolapse.[4,5] While some studies suggest that surgery holds more risks for obese people, little is known about how obesity affects surgical complications in women undergoing pelvic floor disorder surgery. Operative times are longer,[6,7] but a recent study found that complications were not more common in obese than healthy-weight women undergoing retropubic incontinence surgeries.[8]

Obesity may also influence surgical effectiveness. Studies have mixed results about whether obese women have lower success rates after antiincontinence surgery.[9–11] We are aware of no published study that has assessed whether obesity impacts the effectiveness of surgeries for prolapse.

To adequately counsel obese women about surgery and to develop strategies to improve care for obese women, clinicians need information about special problems encountered by these patients. The objectives of this study were to compare anatomic and symptomatic outcomes and complication rates 2 years after sacrocolpopexy with and without Burch colposuspension between obese and healthy-weight women enrolled in the Colpopexy and Urinary Reduction Efforts (CARE) trial.

Materials and Methods

The CARE trial included 322 stress-continent women with stages II–IV pelvic organ prolapse who were planning abdominal sacrocolpopexy.[12,13] This trial was performed through the Pelvic Floor Disorders Network (PFDN), a cooperative agreement network sponsored by the National Institute of Child Health and Human Development. Each clinical site received institutional review board approval, and all women provided written informed consent. The enrolling sites were tertiary care centers, and pelvic floor reconstructive specialists performed the sacrocolpopexy procedures. Some aspects of intraoperative and postoperative care were mandated by protocol, such as deep venous thrombosis prophylaxis, as standard for that site. Other aspects of care were typical (although not specified in the protocol), like early ambulation and early feeding to regular diet before discharge.

This prospectively planned analysis included baseline and 2-year postoperative outcome data and complication and safety data collected throughout the 2-year postoperative period. Demographics and medical history were collected by interview at baseline. We quantified the burden of chronic illness at baseline using the Cumulative Illness Rating Scale (CIRS).[14] At baseline and 2-year postoperative visits, participants underwent the Pelvic Organ Prolapse Quantification (POP-Q) examination[15] by examiners blinded to group assignment. POP-Q points Ba, Bp, C, and the most dependent POP-Q point were used to assess descent of the anterior compartment, posterior compartment, apex, and maximum point of descent, respectively. A standardized stress test was conducted at maximal capacity or 300 mL, whichever was less, in the sitting or standing position, using Valsalva and/or cough as the stress maneuver. A catheterized postvoid residual volume (PVR) was measured after spontaneous voiding.

Validated questionnaires were centrally administered by telephone by trained staff at the Quality of Life (QOL) Interviewing Center, including the Pelvic Floor Distress Inventory

(PFDI), Pelvic Floor Impact Questionnaire (PFIQ), and the 36-item Medical Outcomes Study Short-Form Health Survey (SF-36).[16–18] The PFDI assesses the presence and amount of bother caused by pelvic floor symptoms, and its scales include the Urinary Distress Inventory (UDI), the Pelvic Organ Prolapse Distress Inventory (POPDI), and the Colorectal-anal Distress Inventory (CRADI). Scale scores range from 0–300 (UDI and POPDI) and from 0–400 (CRADI), with higher scores indicating more symptoms, greater bother associated with symptom(s), or both. The PFIQ assesses the impact of symptoms on activities of daily living. The 3 PFIQ scales (Urinary Impact Questionnaire [UIQ], Pelvic Organ Prolapse Impact Questionnaire [POPIQ], and Colorectal-Anal Impact Questionnaire [CRAIQ]) have scores ranging from 0–400, with higher scores indicating greater functional impact. Generic health-related quality of life was assessed with the SF-36. The SF-36 has 2 summary indices, the Mental Component Summary (MCS) and the Physical Component Summary (PCS), which are derived from the weighted averages of the individual domain scores.[19]

Postoperative satisfaction was assessed by responses to 2 items included in the 2-year interviews: “In your opinion, has the treatment of your pelvic floor condition been: very successful, moderately successful, somewhat successful, or not at all successful?,” and “Compared to how you were doing before your recent pelvic floor operation, would you say that you are: much better, a little better, about the same, a little worse, or much worse?”

Serious adverse events (SAE) were recorded throughout the trial and defined as untoward life-threatening or fatal medical occurrences, prolonged hospitalization or readmission for the index surgery, any condition that resulted in persistent or clinically significant disability, or any other important medical condition that occurred in the intra- or postoperative period up to the 2-year visit. SAEs were reviewed by a committee of 3 investigators (who did not enroll or provide care for subjects in the CARE trial) and consensus was used to group the events by the affected organ system or as a febrile illness, wound complication, or blood transfusion.

Stress urinary incontinence was defined as an answer of “yes” to any item of the UDI stress subscale, including leakage related to “coughing, sneezing or laughing,” “physical exercise, such as walking, running, aerobics or tennis,” “lifting or bending over,” and “leakage of small amounts of urine leakage (that is, drops),” and “loss of urine during sexual activity.” Bothersome symptoms were defined as symptoms associated with “moderate” or “quite a bit” of bother. A composite “stress endpoint” was defined as a “yes” response to any of 3 questions on the UDI stress sub-scale (leakage with “coughing, sneezing or laughing,” “physical exercise,” or “lifting or bending over”); urine loss on the standardized cough stress test; or treatment for stress incontinence after the index surgery.

Urge symptoms were defined as an answer of “yes” to any UDI irritative sub-scale question, including urge incontinence, urgency, frequency, nocturia, and enuresis. In addition, a composite “urge endpoint” was defined as any bothersome urge symptom(s) or treatment for bothersome urge symptom(s) after the index surgery. As previously described, imputed values were used for the QOL outcomes in women who had treatment for stress or urge urinary symptoms after the index surgery.[20]

Continuous variables were summarized by mean and standard deviation (SD). Variables with nonnormal distributions were summarized by median with interquartile range (IQR). Baseline body mass index (BMI) was used to define weight groups: obese (≥ 30 kg/m^2), overweight (25–29.9 kg/m^2), healthy weight (18.5–24.9 kg/m^2), and underweight (<18.5 kg/m^2). Baseline characteristics, surgical outcomes, operative variables, and complication rates were compared between the obese and healthy-weight women, which we thought was the

most clinically relevant analysis. This would also help optimize our ability to detect differences associated with BMI using our available sample size. Categorical variables were compared using the χ^2 test (when unadjusted) or by fitting a logistic regression model and testing the coefficient for obesity cohort (when adjusted). Continuous/ordinal variables were compared using the Student *t* test or Wilcoxon rank-sum test (when unadjusted) or by fitting a general linear model either to the values of the dependent variable or to the ranks of the dependent variable and testing the coefficient of the obesity cohort (when adjusted). Comparisons of baseline symptom scores were adjusted for age, previous urinary incontinence or prolapse surgery, and baseline POP-Q stage. Analyses of postoperative variables were adjusted for age and randomization assignment (Burch or no Burch), previous urinary incontinence or prolapse surgery (only urinary incontinence outcomes), and baseline POP-Q stage (only prolapse outcomes).

Statistical significance was reported if $P \leq .05$. With the sample size available for this analysis (74 obese and 125 healthy-weight women), there was 80% power to detect a difference between proportions of 0.5 and 0.7 when testing at a 5% level of significance. Also, when the dependent measure was continuous, there was 80% power to identify a change of 0.41 standard deviations (an effect size of 0.41) when comparing the 2 groups at a 5% level of significance.

Results

The CARE study population included 74 (23.0%) obese, 122 (37.9%) overweight, and 125 (38.8%) healthy-weight women and 1 (0.3%) underweight woman. In the obese group, 55 (74%) of the women had a BMI from 30 to < 35 m/kg^2, 17 (23%) ranged from 35 to <40 m/kg^2, and 2 (3%) had a BMI ≥40 m/kg^2. Patients ranged in age from 31–83 years. Compared to healthy-weight women, obese women who presented for surgery were younger. They were also more likely to be African American, more likely to report diabetes, and more likely to have stage II (rather than stages III or IV) prolapse. The obese group also reported more colorectal symptoms and related functional impact (higher CRADI and CRAIQ scores) and worse physical aspect of health-related QOL (lower SF-36 PCS scores). These and other baseline characteristics are presented in Table 1. (Data from the single underweight woman are not presented.) Comparison of the baseline CRADI subscale scores (data not shown) revealed that the difference seen in overall colorectal symptoms was explained by more painful and irritative colorectal symptoms and more bowel incontinence in the obese group compared to the healthy-weight women ($P = .0006$ and .002, respectively).

Surgical outcomes for obese and healthy-weight women are compared in Table 2. Two years after surgery, stress urinary incontinence and POP-Q stage did not differ between obese and healthy-weight women, and there was no difference in the proportion of women undergoing treatment for stress incontinence (13.8%, obese group and 18.3%, healthy-weight group). Obese women were somewhat more likely to meet the composite urge endpoint at 2 years (46.1% vs 33.3%; $P = .05$) and to obtain treatment for urge symptoms (10.8% vs 4.2%; $P = .06$). Symptom resolution, measured with UDI, POPDI, and CRADI score changes, and satisfaction with surgery did not differ between the groups. Similar to increased baseline bowel symptoms, obese women reported more postoperative bowel symptoms (higher postoperative CRADI scores) compared to healthy-weight women. The change in bowel symptoms from baseline to 2 years for colorectal obstructive and incontinence symptoms did not differ between the groups, and the obese women continued to have higher CRADI-Incontinence scores 2 years after surgery ($P = .001$). The obese group had greater resolution of painful and irritative colorectal symptoms compared to the healthy-weight women ($P = .01$; data not shown).

POP-Q points were similar in obese and healthy-weight women, except for POP-Q point Bp (posterior vaginal descent), which was lower (more prolapsed) in obese women compared to healthy-weight women. Lastly, similar to baseline findings, the SF-36 PCS remained lower in the obese group at 2 years' follow-up, suggesting worse health-related QOL in the physical dimension. There were no differences between the groups with respect to change in the SF-36 PCS and MCS scores.

Mean operative time was significantly higher in the obese cohort compared to the healthy-weight cohort (Table 3); otherwise, there were no differences in estimated blood loss, numbers of concurrent procedures performed, and blood transfusion. Length of hospital stay and immediate postoperative organ system complications, including wound issues and febrile morbidity, were not different between the groups (Table 3). There were also no differences between the groups in postoperative complications assessed at the 6-week, 3-month, and 1-year visits.

By the 2-year visit, significantly more obese women compared to healthy-weight women had at least 1 SAE (36.5% vs 22.4%; $P = .02$). The most common SAE in both groups was urogynecologic. However, the numbers of SAE classified as plausibly related to the index surgery and those affecting the gynecologic and urologic systems did not differ in obese compared to healthy-weight women.

Comment

Obese and healthy-weight women have similar anatomic and functional outcomes 2 years after abdominal sacrocolpopexy, with or without Burch colposuspension, for pelvic organ prolapse. While several studies reported varying results in obese and healthy-weight women after continence surgery,[9–11,21,22] ours is one of the first to report outcomes related to weight after prolapse surgery. Overall stage and symptoms of prolapse did not differ between obese and healthy-weight women 2 years after surgery, but longer follow-up is necessary to determine the effect of time on prolapse recurrence in this population. Literature suggests obese women are at higher risk for prolapse and prolapse progression.[5,23] However, these findings may not apply to prolapse recurrence after abdominal sacrocolpopexy.

Perioperative complications were similar in obese and healthy-weight women after abdominal sacrocolpopexy, in accord with results of a study of 250 women undergoing retropubic colposuspension.[8] In that study, most women underwent concomitant hysterectomy and prolapse surgery at the time of colposuspension, and intraoperative and postoperative complications were similarly low among obese and healthy-weight women. Also similar to our results, there were no differences in intraoperative complications, such as blood loss, organ injury, or other adverse events. Although operative time was slightly longer in obese women in both studies, this difference did not seem to impact perioperative events. In addition, although we found that obese women were more likely than healthy-weight women to have SAEs recorded during the 2-year trial, these excess SAEs did not appear to be related to the surgery, and likely represent medical morbidities that may be more common in the obese.

In our study, postoperative urge symptoms and treatment were higher in obese than healthy-weight women, but we found no difference in postoperative stress urinary incontinence. Previous studies have suggested that higher BMI is associated with more frequent and more severe urinary incontinence.[24–26] However, most of these studies emphasize the association between stress urinary incontinence and higher BMI and do not focus on women after surgery. While the CARE trial excluded women with baseline stress incontinence, we did

not find an increase in stress urinary incontinence in obese women after surgery; however, our power to detect a clinically meaningful difference was limited. Given the observed 38% rate of the composite stress outcome in the healthy-weight women, we had only 28% power to detect, for instance, a 10% increase in this outcome in the obese women.

Before surgery, obese women undergoing abdominal sacrocolpopexy reported more bother and QOL impact from colorectal symptoms and worse general physical health than healthy-weight women, although urinary and prolapse symptoms were similar among groups. Examination of CRADI subscale scores suggest the higher levels of colorectal symptoms in the obese group resulted from more painful/irritative and incontinence symptoms at baseline and from more incontinence symptoms 2 years after surgery. A large study of identical twin sisters found a similar association between obesity and colorectal symptoms in women.[27] In that study, CRADI-Incontinence subscale scores were 5-fold higher in obese than healthy weight identical twin sisters.

Strengths of our study include a large multisite population with numerous surgeons, validated subjective and objective outcome measures, and 2-year follow-up. However, our results are limited to an abdominal approach to prolapse surgery, including sacrocolpopexy with or without Burch colposuspension and other reconstructive procedures, performed by experienced pelvic floor reconstructive surgeons in mostly Caucasian women. Also, the majority of our obese patients were not morbidly obese, and we cannot generalize our results to that group. Additionally, CARE participants were all stress “continent” at baseline, and our UI outcomes may not apply to obese women with preoperative stress urinary incontinence. Longer term follow-up is necessary to determine if obesity is associated with prolapse recurrence over time.

Obese women undergoing abdominal sacrocolpopexy with or without Burch colposuspension have similar outcomes and perioperative complications as healthy-weight women, suggesting surgeons can counsel obese and healthy-weight women similarly in terms of expected outcomes and risks.

Acknowledgments

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TABLE 1

Baseline characteristics presented by weight group and compared between obese and healthy-weight women[a]

Characteristic	Healthy-weight (N = 125)	Overweight (N = 122)	Obese (N = 74)	*P* value[b]
Age (y)	62.1 ± 10.3	61.9 ± 10.2	59.0 ± 9.9	.04
Vaginal parity	3 (2–4)	3 (2–4)	3 (2–3)	.82
Race				.02
White	121 (96.8)	113 (92.6)	64 (86.5)	
Black/African American	2 (1.6)	8 (6.6)	7 (9.5)	
Other	2 (1.6)	1 (0.8)	3 (4.1)	
Education				.19
High school or less	49 (39.2)	67 (54.9)	36 (48.7)	
College degree or higher	76 (60.8)	55 (45.1)	38 (51.4)	
Married or living as married	91 (73.4)	92 (75.4)	55 (75.3)	.76
Postmenopausal	108 (87.8)	110 (90.2)	60 (85.7)	.68
Current smoking	4 (3.2)	12 (9.8)	7 (9.5)	.06
Previous surgery for prolapse or urinary incontinence	50 (40.0)	45 (36.9)	32 (43.2)	.65
Previous abdominal or pelvic surgery	101 (80.8)	99 (81.1)	65 (87.8)	.20
Previous hysterectomy	86 (81.9)	83 (83.0)	58 (89.2)	.20
History of diabetes	2 (1.6)	6 (4.9)	8 (10.8)	.004
History of cardiovascular impairment	62 (49.6)	67 (55.4)	34 (45.9)	.62
History of respiratory impairment	29 (23.4)	26 (21.5)	22 (29.7)	.32
History of renal impairment	2 (1.7)	1 (0.9)	4 (5.5)	.14
Number of prescription medications	3.9 ± 3.1	4.1 ± 2.4	4.2 ± 2.9	.54
CIRS	3.7 ± 2.6	4.1 ± 3.3	4.3 ± 3.4	.16
POP-Q stage				.01
II	14 (11.2)	11 (9.0)	19 (25.7)	
III	91 (72.8)	86 (70.5)	40 (54.1)	
IV	20 (16.0)	25 (20.5)	15 (20.3)	
Randomization to Burch group	62 (49.6)	59 (48.4)	35 (47.3)	.75
				P value[c]
UDI	44.2 (28.7–83.7)	56.2 (28.1–81.2)	57.5 (36.1–97.2)	.23
POPDI	90.5 (57.7–150.0)	91.4 (52.7–149.4)	108.3 (57.1–170.2)	.78
CRADI	40.5 (14.3–92.9)	53.0 (19.6–96.7)	67.6 (21.4–144.4)	.01
UIQ	21.0 (7.7–54.8)	26.9 (10.7–73.3)	43.3 (18.5–97.0)	.002
POPIQ	15.7 (2.3–51.7)	23.6 (0–58.3)	26.7 (4.5–120.6)	.18
CRAIQ	0 (0–18.4)	5.8 (0–36.4)	9.4 (0–81.9)	.001
SF-36 PCS	50.7 (42.3–54.9)	47.1 (39.9–51.9)	41.4 (36.0–49.4)	<.0001
SF-36 MCS	54.4 (49.8–57.5)	54.8 (50.1–58.6)	51.2 (44.0–57.1)	.24

CIRS, Cumulative Illness Rating Scale; *CRADI*, Colorectal Anal Distress Inventory; *CRAIQ*, Colorectal Anal Impact Questionnaire; *MCS*, Mental Component Summary; *PCS*, Physical Component Summary; *POPDI*, Pelvic Organ Prolapse Distress Inventory; *POPIQ*, Pelvic Organ Prolapse Impact Questionnaire; *POP-Q*, Pelvic Organ Prolapse Quantification; *SUI*, stress urinary incontinence; *UDI*, Urinary Distress Inventory; *UIQ*, Urinary Impact Questionnaire.

[a] Weight groups were defined by body mass index: healthy weight (18.5–24.9 kg/m^2), overweight (25–29.9 kg/m^2), and obese (≥ 30 kg/m^2). Data presented as N (column %), mean ± SD, or median (interquartile range).

[b] *P* values for 2-way comparison between healthy weight and obese groups calculated using Student *t* test or χ^2 tests.

[c] *P* value for 2-way comparison between healthy weight and obese groups calculated by fitting a general linear model to ranks, and adjusted for age, baseline POP-Q stage, and previous urinary incontinence or prolapse surgery.

TABLE 2

Surgical outcomes 2 years after sacrocolpopexy with or without Burch colposuspension in healthy-weight and obese participants[a]

Outcomes	Healthy-weight (N = 125)	Obese (N = 74)	*P* value
Urinary incontinence/bladder testing[b]			
SUI symptoms	41 (34.2)	24 (36.9)	.72
Bothersome SUI symptoms	26 (21.7)	13 (20.0)	.74
Positive cough stress test	6 (5.9)	6 (11.3)	.14
Treatment for SUI	22 (18.3)	9 (13.8)	.41
Composite stress outcome[e]	48 (38.4)	27 (41.5)	.90
Urge symptoms	89 (74.2)	53 (81.5)	.14
Bothersome urge UI symptoms	10 (8.3)	9 (13.8)	.19
Treatment for urge symptoms	5 (4.2)	7 (10.8)	.06
Composite urge outcome[f]	40 (33.3)	30 (46.1)	.05
Postvoid residual volume (mL)	29.1 ± 31.3	21.7 ± 24.3	.12
Change in symptom scores[c]			
UDI	12.9 (5.0–27.7)	19.2 (5.0–47.7)	.25
Change in UDI	−26.9 (−55.5 to −9.6)	−27.6 (−58.1 to 0)	.92
POPDI	14.3 (0–37.5)	19.4 (4.2–56.5)	.10
Change in POPDI	−65.8 (−105.9 to −37.5)	−73.5 (−101.2 to −28.6)	.69
CRADI	16.9 (0–43.0)	30.6 (7.7–75.2)	.02
Change in CRADI	−17.4 (−47.9 to 0)	−13.1 (−79.2 to 6.2)	.60
UIQ	3.6 (0–16.1)	7.7 (0–33.2)	.15
Change in UIQ	−8.3 (−37.7 to 0)	−25.7 (−53.7 to −4.2)	.03
POPIQ	0 (0–0)	0 (0–6.8)	.23
Change in POPIQ	−12.1 (−42.6 to 0)	−20.8 (−96.9 to 0)	.22
CRAIQ	0 (0–4.2)	0 (0–15.5)	.20
Change in CRAIQ	0 (−11.6 to 0)	−4.2 (−46.5 to 0)	.03
Prolapse[d]			
POP-Q Stage			.59
0	22 (21.8)	7 (13.2)	
I	36 (35.6)	23 (43.4)	
II	41 (40.6)	23 (43.4)	
III	2 (2.0)	0	
IV	0	0	
Maximal vaginal descent (cm)	−2.0 (2–2.5 to −1.0)	−1.5 (−2.0 to −1.0)	.27
Maximal anterior vaginal descent (point Ba, cm)	−2.0 (−3.0 to −1.0)	−2.0 (−3.0 to −1.5)	.24
Maximal posterior vaginal descent (point Bp, cm)	−3.0 (−3.0 to −2.0)	−2.0 (−3.0 to −1.0)	.003
Maximal apical vaginal descent (point C, cm)	−8.0 (−9.0 to −7.0)	−8.0 (−9.0 to −7.5)	.28

Outcomes	Healthy-weight (N = 125)	Obese (N = 74)	*P* value
Retreatment for prolapse	2 (1.7)	2 (3.1)	.70
Satisfaction and generic health-related quality of life[c]			
"Treatment of pelvic floor condition has been…"			.37
Very successful	83 (72.2)	41 (64.1)	
Moderately successful	19 (16.5)	12 (18.7)	
Somewhat successful	11 (9.6)	10 (15.6)	
Not at all successful	2 (1.7)	1 (1.6)	
"Compared to before your surgery, are you…"			.69
Much better	98 (85.2)	52 (81.3)	
A little better	7 (6.1)	8 (12.5)	
About the same	6 (5.2)	0	
A little worse	4 (3.5)	3 (4.7)	
Much worse	0	1 (1.6)	
SF-36 PCS	52.7 (47.8–56.4)	46.7 (39.5–53.4)	<.001
Change in SF-36 PCS	2.1 (−1.9 to 8.1)	2.5 (−3.0 to 8.2)	.69
SF-36 MCS	55.4 (51.7–58.0)	53.9 (48.9–58.6)	.44
Change in SF-36 MCS	0.4 (−3.3 to 5.6)	0.9 (−3.0 to 7.0)	.75

CRADI, Colorectal Anal Distress Inventory; *CRAIQ*, Colorectal Anal Impact Questionnaire; *MCS*, Mental Component Summary; *PCS*, Physical Component Summary; *POPDI*, Pelvic Organ Prolapse Distress Inventory; *POPIQ*, Pelvic Organ Prolapse Impact Questionnaire; *POP-Q*, Pelvic Organ Prolapse Quantification; *SUI*, stress urinary incontinence; *UDI*, Urinary Distress Inventory; *UI*, urinary incontinence; *UIQ*, Urinary Impact Questionnaire.

[a] Weight groups defined by body mass index: healthy weight (18.5–24.9 kg/m^2) and obese (≥30 kg/m^2). Data presented as N (%), mean ± SD, or median (interquartile range).

[b] *P* value calculated by fitting a logistic regression or a general linear model adjusted for age, Burch, and prior POP/UI surgery.

[c] *P* value calculated by fitting a general linear model to the ranks, adjusted for age and Burch.

[d] *P* value calculated by fitting either logistic regression or a general linear model fit to ranks, adjusted for age, Burch, and baseline POP-Q stage.

[e] Defined as a "yes" response to any of 3 questions on the UDI stress subscale (leakage with "coughing, sneezing or laughing," "physical exercise," or "lifting or bending over") or urine loss on the cough stress test or treatment for SUI.

[f] Defined as any bothersome urge symptom (any UDI irritative subscale symptom [urge incontinence, urgency, frequency, nocturia, and enuresis] present with at least moderate bother) or treatment for any of these symptoms.

TABLE 3

Perioperative and postoperative complication outcomes after sacrocolpopexy with or without Burch colposuspension in healthy-weight and obese participants[a]

	Healthy-weight (N = 125)	Obese (N = 74)	*P* value
Perioperative variables			
General anesthesia	123 (98.4)	73 (98.7)	.98
Estimated blood loss (mL)	203.4 ± 129.6	239.5 ± 156.1	.15
Operative time (min)	169.3 ± 57.9	188.9 ± 52.3	.02
Operative time in no Burch group	157.3 ± 59.5	178.8 ± 54.6	.09
Operative time in Burch group	181.2 ± 54.2	200.0 ± 47.8	.13
Orientation of incision			.09
Vertical	16 (12.8)	14 (18.9)	
Transverse	109 (87.2)	60 (81.1)	
Paravaginal repair performed	26 (20.8)	8 (10.8)	.06
Hysterectomy performed	34 (27.2)	14 (18.9)	.11
Posterior/perineal repair or sacrocolpoperineopexy performed	34 (27.2)	23 (31.1)	.70
Blood transfusion	9 (7.3)	2 (2.7)	.26
Hospital length of stay (d)	2.8 ± 0.8	2.8 ± 1.2	.78
Wound complication	4 (3.2)	1 (1.4)	.48
Febrile complication	18 (14.4)	8 (10.8)	.45
Organ complication	1 (0.8)	4 (5.4)	.06
Cardiovascular complication	9 (7.2)	2 (2.7)	.16
Pulmonary complication	13 (10.4)	5 (6.8)	.50
Gastrointestinal complication	23 (18.4)	15 (20.3)	.77
Neurologic complication	1 (0.8)	1 (1.4)	.71
Adverse event or SAE occurred during hospitalization	19 (15.2)	11 (14.9)	.82
2-year variables			
Hospitalization	25 (20.0)	19 (25.7)	.32
Mesh erosion	7 (5.6)	8 (10.8)	.29
Subjects with SAE(s)	28 (22.4)	27 (36.5)	.02
Subjects with plausibly related SAE(s)	13 (10.4)	10 (13.5)	.60
Subjects with gynecologic or urologic SAE(s)	10 (8.0)	10 (13.5)	.33
Subjects with gastrointestinal SAE(s)	9 (7.2)	7 (9.5)	.32

SAE, serious adverse event.

[a]Weight groups defined by body mass index: healthy weight (18.5–24.9 kg/m^2) and obese (≥ 30 kg/m^2). Data presented as N (%) or mean ± SD. *P* value calculated by fitting logistic regression or a general linear model applied to the ranks, adjusted for age and Burch/no Burch.