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Data Article

Opportunistic salpingectomy during robotic sacrocolpopexy: Data to support a widely accepted practice



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ABSTRACT

While surgical outcomes of prophylactic salpingectomy as an ovarian cancer risk reducing measure at the time of hysterectomy for benign indications has already been studied, data has traditionally been extrapolated to surgery for prolapse repair. A retrospective chart review was performed from medical records of patients who had undergone a sacrocolpopexy for pelvic organ prolapse. Variables collected included operation duration, length of hospital stay, readmission within 31 days, estimated blood loss (EBL), number and size of incisions, as well as narcotic use during hospitalization. Additional procedures performed at the time of operation including vaginal or laparoscopic hysterectomy, transobturator sling, anterior or posterior colporrhaphy, cystoscopy, and robotic ventral mesh rectopexy were collected as potential confounding variables. In addition, data to allow examination of pathology results of all fallopian tubes was collected to determine the proportion of pre-malignant and malignant pathology results. Statistical analyses were performed using SAS version 8. Two cohorts were created: (1) Patients who underwent adnexal surgery (bilateral salpingectomy or salpingoopherectomy) at time of the sacrocolpopexy and (2)

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Patients who underwent a sacrocolpopexy without adnexal surgery. Comparisons were performed with chi-square analysis for discrete variables and group t-tests for continuous level data. Narcotics administered during the immediate post-operative period until discharge was collected for each patient and converted to morphine milligram equivalents (MME) via multiplying the administered dose by the CDC established evidence-based conversion factor. Analysis of covariance (ANCOVA) as well as logistic regression was used to control for confounding variables, including the additional procedures patients had during their operation. An omnibus p-value of 0.05 was used to determine statistical significance for all tests. Due to the exploratory nature of this analysis, there were no corrections applied for multiple comparisons. This data can be used as a basis for researchers to build upon when assessing ovarian cancer primary prevention strategies and associated treatment modalities.

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Specifications Table

Subject	<ul style="list-style-type: none"> • Health and medical sciences • Gynaecology
Specific subject area	Surgical and patient outcomes of prophylactic salpingectomy as an ovarian cancer risk reducing measure at the time of hysterectomy for benign indications.
Type of data	De-identified database extracted from inpatient electronic medical records.
How data were acquired	After Institutional Review Board review and exempt determination, a retrospective chart review was performed for all robotic sacrocolpopexies performed with and without salpingectomies using the robot da Vinci Xi system at Stamford Hospital from January 1, 2014 to March 1, 2022. De-identified data was collected into a secure database, and subsequently coded.
Data format	Microsoft Excel raw database housed in repository: https://doi.org/10.3886/E183444V2
Description of data collection	De-identified data was requested from Stamford Hospital's data warehouse department for women 18+ years or older and billed for the following procedures: 'SACROCOLPOPEXY ROBOT ASSISTED' and 'LAPAROSCOPIC SACROCOLPOPEXY' identified by our hospital's billing and coding team. Patients were excluded if they had a historical salpingectomy (unilateral or bilateral) or salpingoophorectomy and/or any documentation of gynecological malignancies. Convenience sampling was used to include all patients meeting inclusion criteria during the data collection time periods.
Data source location	Institution: Stamford Health City/Town/Region: Stamford, Connecticut Country: United States Latitude and longitude (and GPS coordinates, if possible) for collected samples/data: 41° 3' 10" N, 73° 32' 20" W
Data accessibility	Repository name: Inter-university Consortium for Political and Social Research (ICPSR), openICPSR. Data identification number: 10.3886/E183444V2 Direct URL to data: https://www.openicpsr.org/openicpsr/project/183444/version/V2/view Citation: Dukhovich, Anna. Data to Support a Widely Accepted Practice in Cancer Prevention. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2023-01-03. https://doi.org/10.3886/E183444V2.11 Data for this research are accessible upon registering for a free account via: https://www.icpsr.umich.edu/rpxlogin .

Value of the Data

- Previous research and outcomes of opportunistic salpingectomies have previously been studied and results extrapolated to prolapse repair surgery [2–11]. To the best of our knowledge, this is the first report to describe opportunistic salpingectomy at time of prolapse repair with robotic sacrocolpopexy.
- The gynecologic community, especially female pelvic medicine and reconstructive surgeons focused on prolapse repair, may benefit from data that originates in a cohort of patients they operate on, instead of from other surgical communities [12,13].
- This data highlights the importance of patient education and counseling regarding opportunistic salpingectomy when scheduling a robotic sacrocolpopexy [14,15].
- This data can be used as a foundation for multi-center prospective cohort studies with historical control subjects to assess the cost-effectiveness and long-term outcomes of opportunistic salpingectomy at the time of sacrocolpopexy [8,11,16,17].

1. Objective

The purpose of this dataset was to determine whether patients who underwent a bilateral salpingectomy at the time of robotic sacrocolpopexy differed in outcomes compared to those who did not have concomitant bilateral salpingectomy, based on historical data from our institution prior to a change in practice according to the associated Society of Gynecologic Oncology practice statement [15]. We believe our original raw data pertaining to previously unexplored comparisons among differing surgical population can aid future research in cancer prevention.

2. Data Description

The database contained 181 patients of which 86 were in sacrocolpopexy alone (SC) and 95 in sacrocolpopexy and adnexal surgery (SC-S) cohorts. Demographic comparisons between the SC and SC-S cohorts can be found in Table 1. Patients in the SC group had a mean age of 65.43 (SD = 10.46) with ten (9.3%) patients having prior major abdominal surgery and a mean BMI of 25.90 (SD = 4.26). Similar results were found for the SC-S cohort, with patients having a mean age of 64.24 (SD = 8.98), with only 4.21% (n = 4) having prior major abdominal surgery, and a mean BMI of 25.66 (SD = 3.98). Goodness of fit analysis between cohorts did not find a significant difference on variables including age and BMI.

Table 1
Univariate results between groups.

Variable	Category	Procedure (n=181)		P-value
		Sacrocolpopexy (SC) (n= 86)	Sacrocolpopexy with BS/BSO (SC-S) (n=95)	
		Count (%)	Count (%)	
History of Major Abdominal Surgery	Yes	8 (9.3%)	4 (4.21%)	0.23*
	No	78 (90.7%)	91 (95.79%)	
Readmission within 31 days	Yes	1 (1.16%)	3 (3.16%)	0.62*
	No	85 (98.84%)	92 (96.84%)	
		Mean (SD)	Mean (SD)	P-value
Age		65.43 (10.46)	64.24 (8.98)	0.41
BMI		25.90 (4.26)	25.66 (3.98)	0.68

Table 1 Caption: Demographic comparisons between groups. BS: Bilateral salpingectomy, BSO: Bilateral salpingoopherectomy, BMI: Body mass index, SD: standard deviation. *Fisher's Exact.

Table 2
Univariate outcomes assessment between groups.

Variable	Procedure (n=181)		P-value
	Sacrocolpopexy (SC) (n= 86) Mean (SD)	Sacrocolpopexy with BS/BSO (SC-S) (n=95) Mean (SD)	
Procedure Duration	147.7 (50.69)	152.0 (32.11)	0.47
EBL	85.34 (97.08)	102.7 (87.69)	0.21
LOS	1.19 (1.12)	1.02 (0.20)	0.13
	Count (%)	Count (%)	
Largest incision			
8mm	55 (64.71%)	84 (89.21%)	0.01
12 mm	23 (25.88%)	11 (11.58%)	
MME (mg)	885.5 (408.3)	760.6 (345.1)	0.03

Table 2 Caption: Outcome assessment between groups. BS: Bilateral salpingectomy, BSO: Bilateral salpingoopherectomy, SD: Standard deviation, EBL: Estimated blood loss, LOS: Length of Stay, MME: morphine milligram equivalents.

Table 3
Vaginal versus robotic outcomes analysis.

Variable	Category	Hysterectomy (n=144)		P-value
		Vaginal (n= 131) Count (%)	Laparoscopic supracervical (n=13) Count (%)	
Largest incision	8mm	109 (80%)	1 (7.69%)	<.0001
	12 mm	21 (12.31%)	12(92.31%)	
Procedure Duration		155.2 (41.55)	174.5 (39.42)	0.11
EBL (mL)		104.5 (96.27)	49.23 (34.02)	0.04
MME		797 (358.8)	742 (429.4)	0.62

Table 3 Caption: Outcome Assessment Between Hysterectomies. EBL: Estimated blood loss, MME: morphine milligram equivalents.

Univariate outcome analysis between the cohorts can be found in [Table 2](#). There was a significant difference in the amount of narcotic use during hospitalization between the groups (p=0.03), with the SC-S cohort having comparatively lower mean MME (760.6 mg ± 345.1) than the SC cohort (885.5mg ± 408.3). The difference in length of the largest incision between groups was significantly different (p= 0.001), with the SC cohort having 55 (64.71%) patients with 8mm of largest incision and 23 patients (25.88%) with 12mm. For the SC-S group, 80 patients (84.21%) had 8mm incisions while 11 patients (11.58%) had 12mm as the largest incision. Differences were not found for procedure duration (p = 0.47), EBL (p= 0.21) and LOS (p=0.13). All specimens analyzed by pathology for malignancy were negative.

[Table 3](#) shows the outcomes analysis between the hysterectomies (vaginal vs robotic). There was a significant difference in the length of largest incision differing by route of hysterectomy (p <.0001). There were 12 patients (92.31%) who had a 12 mm incision after undergoing a laparoscopic supracervical hysterectomy as compared to 104 (80%) patients' largest incision was 8mm if they had a vaginal hysterectomy. The mean blood loss after vaginal hysterectomy was 104.5mL± 96.27 compared to 49.235mL± 34.02 in laparoscopic hysterectomy (p=0.04). Significant differences were not found for procedure duration and narcotic use during hospitalization between hysterectomy group.

Further sub-analysis with and without anterior/posterior colporrhaphy can be found in [Table 4](#). Out of 181 patients, 40 (22.1%) had this additional procedure while 141 (77.9%) patients did not. The mean procedure duration with a colporrhaphy was significantly higher (167.2 minutes± 53.17) as compared to 145.1 mins± 36.91 for those only undergoing sacrocolpopexy

Table 4

Adjusting for confounder: "Additional procedures"- ANCOVA analysis.

Variable	Beta (SC-S vs SC)	Procedure (n=181)		P-value
		Sacrocolpopexy (SC) (n= 86) Mean (SD)	Sacrocolpopexy with BS/BSO (SC-S) (n=95) Mean (SD)	
Procedure Duration	3.53	147.65 (50.69)	152.16 (32.11)	0.47
EBL	14.38	85.35 (97.08)	102.66 (87.68)	0.21
LOS	-0.18	1.19 (1.12)	1.02 (0.20)	0.13
MME	-120.89	855.75 (45.74)	734.86 (43.14)	0.03
Age	-1.09	64.81 (1.17)	63.71 (1.09)	0.45
BMI	-0.24	25.85 (0.46)	25.61 (0.46)	0.69

Table 4 Caption: Age, BMI, MME are normally distributed when normality test was done. For others, Levene's test was performed. Non-significant p-value for Levene's test was observed (not shown on the table) which indicates that equal variances are assumed. BS: Bilateral salpingectomy, BSO: Bilateral salpingoophorectomy, EBL: Estimated blood loss, LOS: Length of Stay, MME: morphine milligram equivalents, BMI: Body mass index.

Table 5

Adjusting binary outcome variables for "Additional procedures" confounder via Logistic Regression.

Outcome	Estimating	Beta	P-value	Odds Ratio	95% CI
History of major abdominal surgery (event= Yes)	Sacrocolpopexy with BS/BSO (SC-S)	-0.83	0.18	0.43	0.12-1.50
Readmission within 31 days (event= Yes)	Sacrocolpopexy with BS/BSO (SC-S)	0.96	0.41	2.60	0.26- 25.77

Table 5 Caption: BS: Bilateral salpingectomy, BSO: Bilateral salpingoophorectomy.

($p=0.003$). Similarly, EBL among those with a colporrhaphy was significantly higher ($157.9\text{mL} \pm 133.1$) as compared to those without ($76.81\text{mL} \pm 68.44$) ($p < .0001$). Additionally, as seen in **Table 5**, after taking the additional procedures into account, the results of the regression analysis found lower odds of having a history of major abdominal surgery for the SC-S cohort when compared to the SC cohort, although results did not reach statistical significance (OR = 0.43, 95% CI: 0.12-1.50) ($p=0.18$).

3. Methods and Experimental Design

After Institutional Review Board review and exempt determination, a retrospective chart review was performed for all robotic sacrocolpexies performed with and without salpingectomies using the robot da Vinci Xi system at Stamford Hospital from January 1, 2014, to March 1, 2022. The target population included women who underwent robotic sacrocolpopexy with and without salpingectomy or salpingoophorectomy. Patients were included in the analysis if they were female, age 18 and over, and billed for the following procedures: 'SACROCOLPOPEXY ROBOT ASSISTED' and 'LAPAROSCOPIC SACROCOLPOPEXY' identified by de-identified billing data from our institution. Patients were excluded if they had a history of prior salpingectomies (unilateral or bilateral) or salpingoophorectomy, a history of prior gynecological malignancy, or if their records had missing data. The database containing the raw data analyzed for this report can be found in openICPSR.¹³

Patient charts and operative reports were reviewed and audited to ensure validity of the data. All records with the correct procedure code identified using the electronic medical record (Meditech) over the selected time period were included in the analysis. Variables of interest include operation duration, length of hospital stay, readmission within 31 days, estimated blood loss (EBL), number and size of incisions, and narcotic use during hospitalization. Additional procedures performed at the time of operation including vaginal or laparoscopic hysterectomy, tran-

softrator sling, anterior or posterior colporrhaphy, cystoscopy, and robotic ventral mesh rectopexy were collected as potential confounding variables. In addition, data to allow examination of pathology results of all fallopian tubes was collected to determine the proportion of pre-malignant and malignant pathology results.

All statistical analyses for this project were performed using SAS version 8. For this study, two cohorts were created: (1) Patients who underwent adnexal surgery (bilateral salpingectomy or salpingoopherectomy) at time of the sacrocolpopexy (SC-S) and (2) Patients who underwent a sacrocolpopexy without adnexal surgery (SC). Patient demographic data including age, body mass index (BMI), and history of prior abdominal surgeries was included in the analysis as potential confounding variables. Demographic and outcome variables of interest including procedure duration, EBL, and morphine milligram equivalents (MME) were compared between SC and SC-S cohorts using group t-tests with respective means and standard deviations presented.

Comparisons were performed with chi-square analysis for discrete variables and group t-tests for continuous level data. Narcotics administered during the immediate post-operative period until discharge was collected for each patient and converted to MME via multiplying the administered dose by the CDC established evidence-based conversion factor. Analysis of covariance (ANCOVA) as well as logistic regression was used to control for confounding variables, including the additional procedures patients had during their operation. An omnibus p-value of 0.05 was used to determine statistical significance for all tests. Due to the exploratory nature of this analysis, there were no corrections applied for multiple comparisons.

Ethics Statement

The study protocol (TSH_ObGyn_2019001, WIRB Work Order # 1-1168935-1) was reviewed and approved as exempt by the Stamford Hospital's Institutional Review Board (IRB) of record.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have or could be perceived to have influenced the work reported in this article.

Data availability

[Data to Support a Widely Accepted Practice in Cancer Prevention \(Original data\)](#) (ICPSR).

CRedit Author Statement

Anna Dukhovich: Conceptualization, Data curation, Investigation, Methodology, Writing – original draft; **Marie E. Sullivan:** Data curation, Writing – review & editing; **Josette Hartnett:** Data curation, Investigation, Methodology, Project administration, Resources, Supervision, Writing – review & editing; **Suzanne J. Rose:** Data curation, Investigation, Methodology, Project administration, Resources, Supervision, Writing – review & editing; **Brian J. Hines:** Conceptualization, Methodology, Writing – review & editing.

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