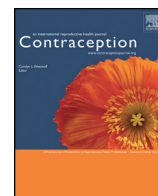




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Original research article

Successful completion of total and partial salpingectomy at the time of cesarean delivery^{☆,☆☆}

Kristiana Lehn^a, Linda Gu^a, Mitchell D. Creinin^{a,b}, Melissa J. Chen^{a,b,*}

^a University of California, Davis School of Medicine, Sacramento, CA 95817

^b Department of Obstetrics and Gynecology, University of California, Davis, Sacramento, CA 95817

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ABSTRACT

Objective: Evaluate completion of partial or total salpingectomy during Cesarean delivery based on intended procedure.

Study design: We conducted a retrospective study of women who had a permanent contraception procedure during Cesarean delivery at an urban, academic hospital from November 2015 through April 2017. We reviewed all charts of women who had a Cesarean delivery to identify those who underwent concomitant tubal surgery, including both completed and attempted procedures. We compared demographic, medical, and obstetric characteristics of participants by planned and completed method using univariate analysis.

Results: We identified 122 women who underwent Cesarean delivery with planned concurrent permanent contraception procedure. Thirty-two (26.2%) women preferred partial salpingectomy and 90 (73.8%) preferred total salpingectomy. All women who desired partial salpingectomy had the procedure performed. However, 17 (18.9%) women desiring total salpingectomy could not have the procedure performed bilaterally: nine underwent a mixed procedure and seven underwent bilateral partial salpingectomy because of adhesions, engorged vasculature, or unspecified reasons. One woman had significant adhesive disease preventing any procedure. Among women who planned a total salpingectomy, having ≥ 3 Cesarean deliveries was the only factor associated with needing an alternative procedure ($P=.04$).

Conclusion: As interest in total salpingectomy for permanent contraception increases, surgeons should counsel women who are interested in total salpingectomy at time of Cesarean delivery that adhesions and tubal proximity to adjacent vessels may preclude completion of bilateral tubal removal and discuss alternative options prior to surgery.

Implications: Interest in bilateral total salpingectomy for permanent contraception at the time of Cesarean delivery is increasing; accordingly, surgeons should counsel patients that adhesions and proximity to large vessels may preclude completion of bilateral total salpingectomy, especially in women who have had multiple prior Cesarean deliveries.

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1. Introduction

In the last decade, fallopian tube removal has emerged as an approach for reducing the risk of ovarian cancer in the absence of an effective screening strategy for this deadly disease [1]. Several studies have demonstrated increasing utilization of total salpingectomy during hysterectomy or laparoscopic interval sterilization [2–6]; however, postpartum total salpingectomy is performed much less commonly [6].

Postpartum permanent contraception procedures occur after 8–9% of hospital deliveries [7], and about 75% of procedures take place during

Cesarean delivery [8]. Therefore, expanding the practice of total salpingectomy for women seeking concomitant permanent contraception with Cesarean delivery has the potential to affect over 300,000 women per year [8]. In addition to ovarian cancer risk reduction, total removal of the fallopian tubes offers nearly 100% contraceptive efficacy, while also reducing the risk of ectopic pregnancies after tubal surgery [9]. In contrast, partial salpingectomy, the traditional method of postpartum female permanent contraception, has a 10-year cumulative failure rate of 7.5 pregnancies per 1000 procedures [10].

Despite these benefits, providers may be concerned about surgical risks with postpartum total salpingectomy, especially those related to engorged mesosalpinx vasculature [9, 11]. Currently, small studies report a slightly longer operative time without an increase in complications when the procedure is successfully completed [6, 12–14]. However, limited data exist describing how often and why total

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* Corresponding author. Tel.: +1 916 734 5673.

E-mail address: mejchen@ucdavis.edu (M.J. Chen).

salpingectomy procedures are unable to be completed at the time of Cesarean delivery [13, 14]. As more clinicians adopt total salpingectomy, information regarding the likelihood of successful completion of bilateral total salpingectomy and differences in safety outcomes between completed and attempted procedures is important to discuss with patients during counseling. In this study, we evaluate the successful completion and safety outcomes of partial and total salpingectomy at the time of Cesarean delivery based on intended procedure.

2. Materials and methods

We performed this retrospective study of all women who underwent a permanent contraception procedure during Cesarean delivery at University of California, Davis Medical Center from November 2015 through April 2017. This time period represents the first 18 months after performing the initial Cesarean delivery with total salpingectomy for permanent contraception. This procedure occurred after family planning specialists collaborated with obstetric providers to increase clinician awareness of total salpingectomy as an option for permanent contraception at Cesarean delivery and to

incorporate standardized patient education tools regarding different permanent contraception methods. The University of California, Davis Institutional Review Board approved this study.

We identified women who had a Cesarean delivery during the study period using the Labor and Delivery Operating Room record, which included both scheduled and unscheduled surgeries. We reviewed all charts to identify women who underwent Cesarean delivery with concomitant tubal surgery, including both completed and attempted procedures. We excluded women who had a peripartum hysterectomy.

Two authors (K.L., L.G.) reviewed patient charts in the electronic medical record, and a third investigator (M.J.C.) confirmed the accuracy of abstracted data. We obtained demographic information (age, ethnicity/race, insurance status), medical co-morbidities, previous abdominal surgeries, obstetric history (gravidity, parity, number of prior Cesarean delivery), smoking status, and body mass index (BMI) at time of delivery. The primary outcome of the study is the proportion of permanent contraception procedures completed as planned. We reviewed both preoperative documentation (e.g., prenatal care notes, history and physical, and consent form) and the operative report to determine the type of permanent contraception procedure planned and

Table 1

Demographic, obstetric, and medical characteristics by planned and completed procedure in women desiring permanent contraception at Cesarean delivery

Characteristic	Planned and completed partial salpingectomy (n=32)	Planned and completed total salpingectomy (n=73)	Planned total salpingectomy and completed partial, mixed, or no procedure (n=17)*	p-value comparing all three groups	p-value comparing women who planned total salpingectomy
Age (years)	33 (26.5–37)	34 (32–38)	32 (29–36)	.28 [†]	.17 [‡]
BMI (kg/m ²) at delivery	33.1 (29.0–39.6)	33.4 (28.7–38.9)	34.2 (30.0–36.6)	.89 [†]	.74 [‡]
Obese (BMI≥30)	20 (62.5)	52 (71.2)	13 (76.5)	.59 [§]	.77
Race/ethnicity					
White	10 (31.3)	33 (45.2)	5 (29.4)	.21	.36
Hispanic	11 (34.4)	30 (41.1)	7 (41.2)		
African American	3 (9.4)	5 (6.8)	3 (17.6)		
Asian and Pacific Islander	6 (18.8)	4 (5.5)	2 (11.8)		
Other or missing	2 (6.3)	1 (1.4)	0		
Publicly Insured	20 (62.5)	37 (50.7)	12 (70.6)	.26 [§]	.18
Gravidity	4 (2.5–6)	4 (3–5)	4 (3–5)	.94 [†]	.88 [‡]
Parity	2 (1–3)	2 (1–3)	2 (1–3)	.84 [†]	.64 [‡]
Number of prior Cesarean deliveries					
0	9 (28.1)	20 (27.4)	1 (5.9)	.20	.04
1	12 (37.5)	27 (37.0)	8 (47.1)		
2	7 (21.9)	20 (27.4)	3 (17.6)		
3 or more	4 (12.5)	6 (8.2)	5 (29.4)		
Other abdominal surgery	8 (25.0)	16 (21.9)	1 (5.9)	.28	.18
Medical co-morbidities					
Autoimmune disease	0	1 (1.4)	1 (5.9)	.12 [§]	.42 [#]
Chronic hypertension and hypertensive disorders in pregnancy	10 (31.3)	16 (21.9)	4 (23.5)		
Drug use	0	2 (2.7)	0		
Gestational diabetes	10 (31.3)	20 (27.4)	5 (29.5)		
Pre-gestational diabetes	3 (9.4)	8 (11.0)	2 (11.8)		
Pre-existing infection	1 (3.1)	1 (1.4)	1 (5.9)		
Pulmonary disease	7 (21.9)	9 (12.3)	3 (17.6)		
Renal disease	1 (3.1)	1 (1.4)	0		
Structural heart disease and/or heart failure	2 (6.3)	4 (5.5)	1 (5.9)		
Structural uterine diagnoses	4 (12.5)	4 (5.5)	1 (5.9)		
Vascular disease with or without anticoagulation	1 (3.1)	3 (4.1)	0		
None	12 (37.5)	43 (58.9)	8 (47.1)		
Multiple gestation	3 (9.4)	5 (6.8)	0	.59	.58
Smoking during pregnancy	3 (9.4)	1 (1.4)	1 (5.9)	.09	.34
Gestational age at delivery	38.6 (36.7–39.0)	39.0 (37.0–39.1)	38.1 (37.3–39.0)	.75 [†]	.55 [‡]
Scheduled delivery	17 (53.1)	51 (69.9)	12 (70.6)	.25 [§]	>.99
Low transverse cesarean delivery	32 (100.0)	71 (97.3)	16 (94.1)	.50	>.99
Transverse skin incision	31 (96.9)	72 (98.6)	16 (94.1)	.35	.34

Data presented as n (%) or median (interquartile range).

* This group includes 7 women who had bilateral partial salpingectomy, 9 who had mixed total and partial salpingectomy, and 1 who was unable to have any permanent contraception procedure completed.

[†] Kruskal-Wallis test used to perform comparison.

[‡] Mann-Whitney *U* test used to perform comparison.

[§] chi-Square test used to perform comparison.

^{||} Fisher's Exact test used to perform comparison.

[§] Each woman could have more than one medical-comorbidity. chi-Square test used to compare proportion of women with no medical co-morbidities among the groups.

[#] Each woman could have more than one medical-comorbidity. Fisher Exact test used to compare proportion of women with no medical co-morbidities among the groups.

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