

# Spontaneous intrauterine pregnancy after tubal sterilization: A case report

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Lauren Lim<sup>1</sup>  and Heather Fuentes<sup>1,2</sup>

## Abstract

The sterilization failure rate of a total bilateral salpingectomy is unknown. After a total bilateral salpingectomy, spontaneous intrauterine pregnancy is extremely rare; only four cases have been documented. This case report describes a 34-year-old G4P1213 with a history of bilateral salpingectomy who was found to have a viable intrauterine pregnancy. The pregnancy was continued and ended in a repeat cesarean section. At the time of surgery, a left tubal remnant was noted. While the patient was originally reported to have a complete salpingectomy, the evidence of a tubal stump makes this an unintended partial salpingectomy. It is theorized that dense pelvic adhesions at the time of the left salpingectomy increased the likelihood of sterilization failure. This is the first case report to evaluate the pelvic cavity after an intrauterine pregnancy following a reported complete bilateral salpingectomy. Patients should be counseled on the risk of ectopic and intrauterine pregnancy following a bilateral salpingectomy.

## Keywords

Women's health, salpingectomy, failed sterilization, pathology, tubal sterilization

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## Introduction

A bilateral total salpingectomy is a permanent and irreversible form of contraception. Failure of a tubal sterilization more frequently results in an ectopic pregnancy rather than intrauterine pregnancy. Spontaneous intrauterine pregnancies following a total bilateral salpingectomy are extremely rare; only four cases have been reported.<sup>1</sup> None of these previously reported pregnancies were followed to delivery. The cause of failure is unknown, but a fistula tract, patent cornual end, and incomplete salpingectomies are some theories.<sup>1,2</sup> This case reviews the probable cause of a spontaneous intrauterine pregnancy following a reported bilateral complete salpingectomy. Ethical approval to report this case was obtained from the University of Nevada, Reno Institutional Review Board IRB #2011656-1, and written informed consent was obtained from the patient for their anonymized information to be published in this article.

## Case

The patient is a 34-year-old G4P1213 woman with no significant past medical history who presented in 2022 with a viable intrauterine pregnancy status post-bilateral salpingectomy. In 2017, the patient had a ruptured cornual ectopic

pregnancy, and the right fallopian tube was completely removed. The pathology report confirmed a 9.5 cm fimbriated fallopian tube. In 2018, the patient underwent a hysterosalpingography which showed a normal appearance of the left fallopian tube with free spillage and a surgically absent right fallopian tube with no spillage. In 2020, she had a planned pregnancy which resulted in an emergency cesarean section due to placental abruption at 27 weeks and 3 days. During this delivery, she requested permanent sterilization. In the operative report, the surgeon noted the right tube was completely absent and stated that the left tube was “incased in filmy adhesions, distorting normal anatomy” but that the entire tube was resected. The pathology report confirmed a 4.6 cm fimbriated fallopian tube.

In 2022, the patient presented to urgent care with symptoms of nausea and exhaustion. A urine pregnancy test was

<sup>1</sup>The University of Nevada, Reno School of Medicine, Reno, NV, USA

<sup>2</sup>Renown Medical Group- Women's Health, Reno, NV, USA

### Corresponding Author:

Lauren Lim, University of Nevada, Reno School of Medicine, 1664 N Virginia Street, Reno, NV 89557, USA.

Email: llim@med.unr.edu



positive. With transvaginal ultrasound, this pregnancy was confirmed to be a viable intrauterine pregnancy. The patient elected to continue the pregnancy. She had regular prenatal care, and the intrauterine pregnancy had no signs of abnormalities. The patient had an emergency cesarean section at 33 weeks of gestation, again due to placental abruption. During the surgery, the surgeon noted an apparent tubal remnant estimated to be 3–4 cm on the left side of the uterus. Prior to the emergency cesarean, the patient did not consent to any additional sterilization procedures, so the finding was not removed. The patient had a normal postpartum course. Her baby was admitted to the neonatal intensive care unit due to prematurity and was discharged home after 37 days. The patient was seen 2 weeks and 6 weeks following her surgery, and her postpartum course was uncomplicated.

## Discussion

Tubal ligation is one of the most common forms of contraception in the United States because it is a safe procedure with extremely effective outcomes.<sup>3–5</sup> The U.S. Collaborative Review of Sterilization conducted a prospective trial between 1978 and 1986 that revealed women between the ages of 28 and 33 who have a postpartum partial salpingectomy have a failure rate of 1.2 for every 1000 cases.<sup>6</sup> The 10-year failure rate of tubal sterilization through various salpingectomy techniques, including partial and total, is 0.0185% (95% CI 15.1–21.8).<sup>6</sup> A failure consisted of a positive pregnancy, regardless of pregnancy location and outcome. Since the trial, total salpingectomies have begun to replace partial salpingectomies as the standard of care for tubal sterilization. Total salpingectomy has come into favor because research has shown up to 70% of ovarian cancers may arise from the fallopian tube.<sup>3,5,7</sup> For this reason, the American College of Obstetricians and Gynecologists and The Society of Gynecologic Oncology recommend a total salpingectomy over a partial salpingectomy.<sup>8</sup> While failures following sterilization have been reported, total salpingectomy remains an extremely effective form of contraception.<sup>3,6</sup> However, to the best of the author's knowledge, the failure rate of total bilateral salpingectomy specifically has not been reported in the literature.

The failures of total bilateral salpingectomies can result in ectopic or intrauterine pregnancies.<sup>9,10</sup> A 2022 systematic review identified only four cases of spontaneous intrauterine pregnancy after a total bilateral salpingectomy.<sup>1</sup> Three of the four of these pregnancies were terminated. Two of these cases reported previous cornual ectopic pregnancies, similar to the patient in this case. Prior to this patient's most recent c-section in which the tubal remnant was discovered, this case would have met the inclusion criteria of the aforementioned systematic review. However, because the tubal stump was recognized on the repeat c-section, it is now clear that this case would not meet the inclusion criteria. This case cannot be considered a complete bilateral salpingectomy, but a partial salpingectomy secondary to incomplete surgical resection. This is the first case report to evaluate the pelvic

cavity following a spontaneous intrauterine pregnancy status post-total bilateral salpingectomy.

In reviewing operative notes of this case from the c-section and left tubal removal in 2020, the prior surgeon believed the whole tube was resected. Upon further evaluation of the pathology report and following surgeries, this was not the case. The operative note describes adhesions surrounding the fallopian tube that were carefully dissected before the ligation of the tube. The pathology reports note the left fallopian tube was 4.6 cm while the right fallopian tube was 9.5 cm. The 3–4 cm tubal remnant was seen on the left side of the uterus. This length discrepancy supports the theory that the left tube was not entirely removed, despite what the operative report indicated. While the remnant found during the patient's most recent c-section has been clinically determined to be a tubal stump, the finding was not removed. So, there is no pathology report to confirm that the remnant was indeed a segment of the left fallopian tube.

The pelvic adhesions noted by the surgeon may have caused the tubal dissection to be more challenging, resulting in an accidental incomplete dissection. This patient's obstetric and pelvic surgery history is a major risk factor for the development of dense pelvic adhesions. Previous case reports emphasize the importance of complete resection of tubal stumps to prevent the occurrence and recurrence of ectopic pregnancies.<sup>11,12</sup> The U.S. Collaborative Review of Sterilization trial's report of failure rate did not take surgeon skill into account but surgical learning curve and surgical volume are important considerations when reviewing surgical outcomes.<sup>13–15</sup> Because the pelvic cavity was not evaluated in any of the four cases reported in the 2022 systematic review, it is unclear if these cases were true bilateral salpingectomies, or like in this case, unintentional partial salpingectomies.<sup>1</sup> A more difficult fallopian tube dissection could increase the risk of sterilization failure.

## Conclusion

This study describes the consequence of an incomplete fallopian tube resection resulting in an intrauterine pregnancy, rather than an ectopic pregnancy. Resection of the entire tube may be more difficult with increased adhesions from previous pelvic surgeries or trauma. Patients with a history of bilateral salpingectomy who present with symptoms of pregnancy should be evaluated with a beta-subunit of human chorionic gonadotropin, and if positive, a pelvic ultrasound performed to investigate the location of pregnancy. The long-term failure rate of bilateral salpingectomy has yet to be established. Patients interested in a bilateral salpingectomy for sterilization purposes should be reassured that the failure rate is likely exceedingly low, but the risk is not zero.

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### Author contributions

L.L. contributed to the investigation, writing, and editing and H.F. contributed to the supervision and editing of the case report manuscript.

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### Informed consent

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### ORCID iD

Lauren Lim  <https://orcid.org/0000-0001-5077-4299>

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