



# CONTRACEPTION

Adopting the “opportunistic salpingectomy philosophy” for benign hysterectomies has been fairly easy for ObGyns, but what about for permanent contraception? Is it time to advocate for this global practice?

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According to the most recent data (2011–2013), 62% of women of childbearing age (15–44 years) use some method of contraception. Of these “contracepting” women, about 25% reported relying on permanent contraception, making it one of the most common methods of contraception used by women in the United States (FIGURE 1, page 18).<sup>1,2</sup> Women either can choose to have a permanent contraception procedure performed immediately postpartum, which occurs after approximately 9% of all hospital deliveries in the United States,<sup>3</sup> or at a time separate from pregnancy.

The most common methods of permanent contraception include partial salpingectomy at the time of cesarean delivery or within 24 hours after vaginal delivery and laparoscopic occlusive procedures at a time unrelated to the postpartum period.<sup>3</sup> Hysteroscopic occlusion of the tubal ostia is a newer option, introduced in 2002; its worldwide use is concentrated in the United States, which accounts for 80% of sales based on revenue.<sup>4</sup>

Historically, for procedures remote from pregnancy, the laparoscopic approach evolved with less sophisticated laparoscopic equipment and limited visualization, which resulted in efficiency and safety

being the primary goals of the procedure.<sup>5</sup> Accordingly, rapid occlusive procedures were commonplace. However, advancement of laparoscopic technology related to insufflation systems, surgical equipment, and video capabilities did not change this practice.

Recent literature has suggested that complete fallopian tube removal provides additional benefits. With increasing knowledge about the origin of ovarian cancer, as well as increasing data to support the hypothesis that complete tubal excision results in increased ovarian cancer protection when compared with occlusive or partial salpingectomies, both the American College of Obstetricians and Gynecologists (ACOG)<sup>6</sup> and the Society of Gynecologic Oncology (SGO)<sup>7</sup> recommend discussing bilateral total salpingectomy with patients desiring permanent contraception. Although occlusive procedures decrease a woman’s lifetime risk of ovarian cancer by 24% to 34%,<sup>8,9</sup> total salpingectomy likely reduces this risk by 49% to 65%.<sup>10,11</sup>

With this new evidence, McAlpine and colleagues initiated an educational campaign, targeting all ObGyns in British Columbia, which outlined the role of the fallopian tube in ovarian cancer and urged the consideration of total salpingectomy for permanent

## IN THIS ARTICLE

**Total salpingectomy at delivery**

page 18

**Interval permanent contraception**

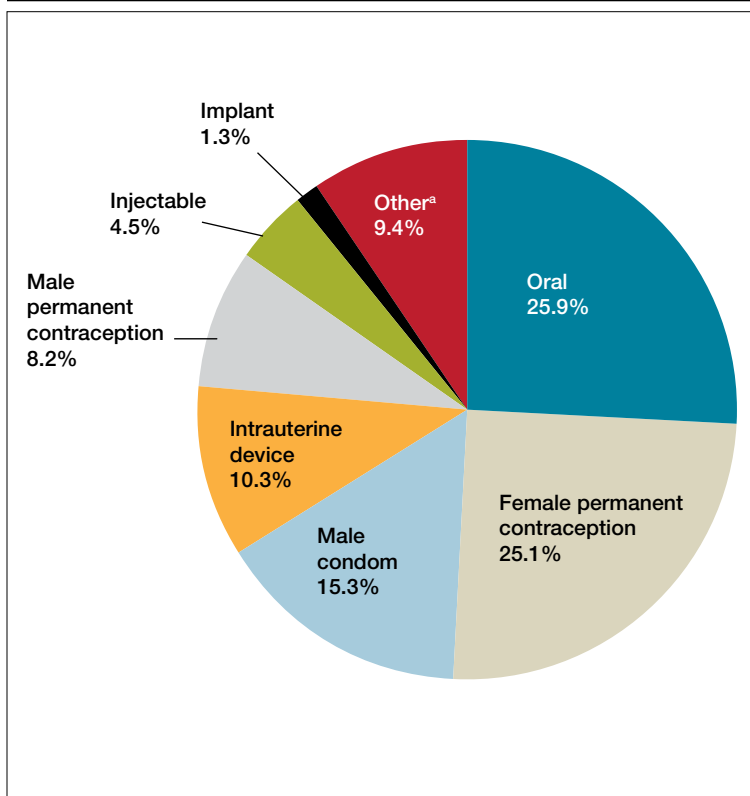
page 22

**Tube removal and ovarian reserve**

page 23



**FIGURE 1** Percent distribution of  
contracepting women by type of method:  
United States, 2011–2013<sup>1,2</sup>



<sup>a</sup>Other includes withdrawal (4.8%), hormonal ring or patch (2.6%), and “other” (2.0%).

contraception in place of occlusive or partial salpingectomy procedures. They found that this one-time targeted education increased the use of total salpingectomy for permanent contraception from 0.5% at 2 years before the intervention to 33.3% by 2 years afterwards.<sup>12</sup> On average, laparoscopic bilateral salpingectomy took 10 minutes longer to complete than occlusive procedures. Most importantly, they found no significant differences in complication rates, including hospital readmissions or blood transfusions.

Although our community can be applauded for the rapid uptake of concomitant bilateral salpingectomy at the time of benign hysterectomy,<sup>12,13</sup> offering total salpingectomy for permanent contraception is far from common practice. Similarly, while multiple studies have been published to support the practice of opportunistic salpingectomy at the time of hysterectomy, little has been published about the use of bilateral salpingectomy for permanent contraception until this past year.

In this article, we review some of the first publications to focus specifically on the feasibility and safety profile of performing either immediate postpartum total salpingectomy or interval total salpingectomy in women desiring permanent contraception.

## Stop using the term “sterilization”

Family Planning experts are now strongly discouraging the use of terms like “sterilization,” “permanent sterilization,” and “tubal ligation” due to sterilization abuses that affected vulnerable and marginalized populations in the United States during the early- to mid-20th century.

In 1907, Indiana was the first state to enact a eugenics-based permanent sterilization law, which initiated an aggressive eugenics movement across the United States. This movement lasted for approximately 70 years and resulted in the sterilization of more than 60,000 women, men, and children against their will or without their knowledge. One of the major contributors to this movement was the state of California, which sterilized more than 20,000 women, men, and children.

They defined sterilization as a prophylactic measure that

could simultaneously defend public health, preserve precious fiscal resources, and mitigate menace of the “unfit and feeble-minded.” The US eugenics movement even inspired Hitler and the Nazi eugenics movement in Germany.

Because of these reproductive rights atrocities, a large counter movement to protect the rights of women, men, and children resulted in the creation of the Medicaid permanent sterilization consents that we still use today. Although some experts question whether the current Medicaid protective policy should be reevaluated, many are focused on the use of less offensive language when discussing the topic.

Current recommendations are to use the phrase “permanent contraception” or simply refer to the procedure name (salpingectomy, vasectomy, tubal occlusion, etc.) to move away from the connection to the eugenics movement.

# Total salpingectomy: A viable option for permanent contraception after vaginal or at cesarean delivery

Shinar S, Blecher Y, Alpern S, et al. Total bilateral salpingectomy versus partial bilateral salpingectomy for permanent sterilization during cesarean delivery. *Arch Gynecol Obstet.* 2017;295(5):1185-1189.

Danis RB, Della Badia CR, Richard SD. Postpartum permanent sterilization: could bilateral salpingectomy replace bilateral tubal ligation? *J Minim Invasive Gynecol.* 2016;23(6):928-932.

Shinar and colleagues presented a retrospective case series that included women undergoing permanent contraception procedures during cesarean delivery at a single tertiary medical center. The authors evaluated outcomes before and after a global hospital policy changed the preferred permanent contraception procedure from partial to total salpingectomy.

## Details of the Shinar technique and outcomes

Of the 149 women included, 99 underwent partial salpingectomy via the modified Pomeroy technique and 50 underwent total salpingectomy using an electrothermal bipolar tissue-sealing instrument (Ligasure). The authors found no difference in operative times and similar rates of complications. Composite adverse outcomes, defined as surgery duration greater than 45 minutes, hemoglobin decline greater than 1.2 g/dL, need for blood transfusion, prolonged hospitalization, ICU admission, or re-laparotomy, were comparable and were reported as 30.3% and 36.0% in the partial and total salpingectomy groups, respectively, ( $P = .57$ ). One major complication occurred in the total salpingectomy cohort; postoperatively the patient had hemodynamic instability

and was found to have hemoperitoneum requiring exploratory laparotomy. Significant bleeding from the bilateral mesosalpinges was discovered, presumably directly related to the total salpingectomy.

## Details of Danis et al

Intuitively, performing salpingectomy at the time of cesarean delivery does not seem as significant a change in practice as would performing salpingectomy through a small periumbilical incision after vaginal delivery. However, Danis and colleagues did just that; they published a retrospective case series of total salpingectomy performed within 24 hours after a vaginal delivery at an urban, academic institution. They included all women admitted for full-term vaginal deliveries who desired permanent contraception, with no exclusion criteria related to body mass index (BMI). The authors reported on 80 women, including 64 (80%) who underwent partial salpingectomy via the modified Pomeroy or Parkland technique and 16 (20%) who underwent total salpingectomy. Most women had a BMI of less than 30 kg/m<sup>2</sup>; less than 15% of the women in each group had a BMI greater than 40 kg/m<sup>2</sup>.

The technique for total salpingectomy involved a 2- to 3-cm vertical incision at the level of the umbilicus, elevation of the entire fallopian tube with 2 Babcock clamps, followed by the development of 2 to 3 windows with monopolar electrocautery in the mesosalpinx and subsequent suture ligation with polyglactin 910 (Vicryl, Ethicon).

Major findings included slightly longer operative time in the total salpingectomy compared with the partial salpingectomy group (a finding consistent with other



**Minimal operative time differences between total and partial salpingectomy were found in both case series**



studies<sup>12,14,15</sup>) and no difference in complication rates. The average (SD) surgical time in the partial salpingectomy group was 59 (16) minutes, compared with 71 (6) minutes in the total salpingectomy group ( $P = .003$ ). The

authors reported 4 (6.3%) complications in the partial salpingectomy group—ileus, excessive bleeding from mesosalpinx, and incisional site hematoma—and no complications in the total salpingectomy group ( $P = .58$ ).

### WHAT THIS EVIDENCE MEANS FOR PRACTICE

These 2 studies, although small retrospective case series, demonstrate the feasibility of performing total salpingectomies with minimal operative time differences when compared with more traditional partial salpingectomy procedures. The re-laparotomy complication noted in the Shinar series cannot be dismissed, as this is a major morbidity, but it also should not dictate the conversation.

Overall, the need for blood transfusion or unintended major surgery after permanent contraception procedures is rare. In the U.S. Collaborative Review of Sterilization study, none of the 282 women who had a permanent contraception procedure performed via laparotomy experienced either of these

outcomes.<sup>16</sup> Only 1 of the 9,475 women (0.01%) having a laparoscopic procedure in this study required blood transfusion and 14 (0.15%) required reoperation secondary to a procedure complication.<sup>17</sup> The complication reported in the Shinar study reminds us that the technique for salpingectomy in the postpartum period, whether partial or total, should be considered carefully, being mindful of the anatomical changes that occur in pregnancy.

While larger studies should be performed to confirm these initial findings, these 2 articles provide the reassurance that many providers may need before beginning to offer total salpingectomy procedures in the immediate postpartum period.

## Feasibility of interval laparoscopic permanent contraception via bilateral salpingectomy

*Westberg J, Scott F, Creinin MD. Safety outcomes of female sterilization by salpingectomy and tubal occlusion. Contraception. 2017;95(5):505-508.*

In this retrospective study, authors used billing data to identify women undergoing interval laparoscopic permanent contraception at a single academic medical center. They educated physicians and patients about the potential benefits to ovarian cancer risk with total salpingectomy (similar to the educational initiative done in British Columbia) and discussed the requirement for the extra incision and more time for the surgery. From

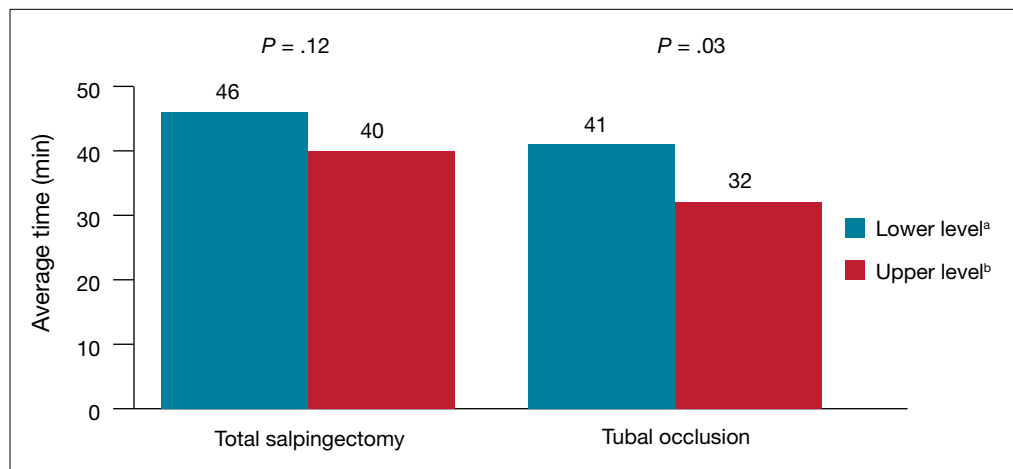
2013 to 2015 use of salpingectomy for permanent contraception changed from 45% of the procedures to 85%, a fairly dramatic trend.<sup>18</sup> With these data, the authors compared outcomes between the women receiving tubal occlusive procedures and women receiving bilateral salpingectomy.

### Details of surgical time and complications

Tubal occlusion procedures were performed through 2 abdominal ports, and device placement was at the discretion of the provider. Bilateral salpingectomies were



**FIGURE 2** Surgical times for total salpingectomy and tubal occlusion procedures based on gynecology resident year<sup>15</sup>



<sup>a</sup>Years 1 and 2 of residency.  
<sup>b</sup>Years 3 and 4 of residency.

performed through 3 abdominal port sites with an electrothermal bipolar tissue-sealing instrument. A total of 149 procedures were identified, 68 tubal occlusions (19% Falope rings, 32% bipolar cautery, and 47% Filshie clips) and 81 bilateral salpingectomies.

The surgical time average (SD) was 6 minutes longer for the salpingectomies (44 [13] minutes vs 38 [15] minutes;  $P = .018$ ). As would be expected, more experienced residents had shorter surgical times when compared with less experienced residents for both procedures (FIGURE 2).<sup>15</sup> Similar rates of both immediate and short-term surgical complications were noted. One immediate complication was reported in each group, both of which were secondary to anesthesia issues.

Interestingly, short-term complications were lower in the salpingectomy group (4.9%) versus the tubal occlusion group (14.7%), although this difference was barely not statistically significant ( $P = .051$ ). These complications included 1 incisional site infection requiring oral antibiotics and

3 cases of increased pain in the salpingectomy group and 4 incisional site infections with 6 patients reporting increased pain in the tubal occlusion group.

**FAST TRACK**

**Tubal occlusion procedure length averaged only 6 minutes less than bilateral salpingectomies, and more experienced residents had shorter surgical times**

**WHAT THIS EVIDENCE MEANS FOR PRACTICE**

This retrospective analysis provides further reassurance regarding the safety of offering bilateral salpingectomy to patients desiring permanent contraception. This study again consistently demonstrates that bilateral salpingectomy increases the operative time, but only minimally, which is unlikely clinically significant, especially when considering the potential benefits from total salpingectomy (increased ovarian cancer protection, higher contraceptive efficacy, decreased ectopic pregnancy rates, reduced risk of future surgeries for such tubal pathology as hydrosalpinx, etc). The study also shows that educational initiatives targeted at providers likely will increase acceptability as well as uptake of this practice for permanent contraception.

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## Our contraceptive counseling philosophy: The shared decision-making model

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When women present for permanent contraception counseling, we must remember that our patients' needs are often far too diverse and dynamic to allow a universal counseling technique. Every provider likely has a counseling style, with a structure and language that has been altered and changed through years of practice, patient experiences, and new scientific technologies and data. Unfortunately, provider biases and past coercive practices also influence contraceptive counseling.

Historically, some providers used formulas related to a woman's age and parity to decide if she could have a permanent contraception procedure, possibly based on fears of patient regret. Such practices are an embarrassment to the principles of patient autonomy and empowerment, which should serve as the foundation for any contraceptive conversation. Studies of regret after permanent contraception procedures are often misinterpreted; although younger women experience higher rates of regret, the absolute rate still favors performing the procedure.<sup>1,2</sup> When comparing women aged 30 or younger to those older than 30 years at the time of procedure, the vast majority (about 80%) of those 30 and younger do not express regret.<sup>1</sup> Less than 5% of women who express regret access a reversal procedure.<sup>2,3</sup> Our job as providers is to educate and allow women to understand the options—and with permanent contraception that also means explaining the potential for regret; however, empowering women does not mean limiting an opportunity for the majority to potentially impact the minority.

Our contraceptive counseling philosophy follows the shared decision-making model. This model informs the patient, tailors the conversation toward her priorities, and maintains patient autonomy, while empowering the patient to take control of her reproductive health and future. When a patient expresses the desire for permanent contraception, we ensure she understands the permanence of the procedure and offer information about other Tier 1 contraceptive options, including long-acting reversible methods and vasectomy. We use the evidence-based World Health Organization counseling table<sup>4,5</sup> to assist with the discussion and provide vasectomy referral and further information about specific intrauterine devices or the contraceptive implant based on the woman's interests.

For women who desire a female permanent contraception procedure, we also provide information tables comparing laparoscopic tubal occlusion procedures, laparoscopic bilateral salpingectomy, and hysteroscopic tubal occlusion. These tables review how each procedure is performed; risks and benefits, including failure rates over time; and ovarian cancer protection estimates. Our office also has devised tables to inform women seeking permanent contraception immediately after delivery and unrelated to pregnancy. Ultimately, the woman can choose what makes the most sense for her at that specific time in her life, and as providers we must support and uphold that decision.

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**Offering patients comparative information on permanent contraception options, risks, benefits, failure rates, and ovarian cancer prevention can aid the decision-making process**

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### WATCH FOR...

**>> Update on femal sexual dysfunction**  
from Barbara Levy, MD

CONTINUED ON PAGE 44



# Does total removal of the tubes affect ovarian reserve?

Ganer Herman H, Gluck O, Keidar R, et al. Ovarian reserve following cesarean section with salpingectomy vs tubal ligation: a randomized trial. *Am J Obstet Gynecol.* 2017;doi: 10.1016/j.ajog.2017.04.028.

As acceptability of total salpingectomy for permanent contraception increases, one concern is that complete removal may alter blood supply to the ovary, resulting in decreased ovarian reserve and, subsequently, earlier menopause. Several studies have addressed the potential effect of salpingectomy on ovarian function when performed at the time of hysterectomy, most of which have noted no difference in anti-Müllerian hormone (AMH) levels and sonographic parameters following surgery.<sup>19</sup> However, very little has been published to assess this same question when the salpingectomy is performed for the purpose of permanent contraception.

Ganer Herman and colleagues aimed to assess short-term ovarian reserve by measuring AMH levels preoperatively and 6 to 8 weeks postoperatively in patients undergoing partial or total salpingectomy at the time of elective cesarean delivery.

## Details of the study

The study included women aged 18 to 45 who presented for elective cesarean delivery and who requested permanent contraception. Exclusion criteria included previous tubal surgery, emergent cesarean delivery, personal history of breast carcinoma, familial history of ovarian carcinoma, and *BRCA* carriage.

Women were randomly assigned at a 1:1 ratio to bilateral total salpingectomy or bilateral partial salpingectomy. A complete blood count and AMH level were drawn the night prior to surgery. Intraoperatively, after delivery and hysterotomy closure, partial sal-

pingectomy, via the Parkland technique, or total salpingectomy, using a suture ligation technique, was performed.

Of the 46 women enrolled, follow-up was completed by 16 of 22 women (72%) in the total salpingectomy group and 18 of 24 women (75%) in the partial salpingectomy group. Patients in the total salpingectomy group were slightly older (mean age, 37 vs 34 years;  $P = .02$ ), but otherwise all demographic and obstetric characteristics were comparable.

**No differences were noted in preoperative and postoperative AMH levels between groups**, with an average (SD) increase of 0.58 (0.98) ng/mL versus 0.39 (0.41) ng/mL in the total salpingectomy and partial salpingectomy groups, respectively ( $P = .45$ ), consistent with known postpartum AMH level trends.

Other findings included an average 13-minute increase in operative time in the total salpingectomy cases, similar safety profile of the 2 methods as there were no postoperative complications during the study period, and no differences in postoperative hemoglobin levels.


## Conclusion

The studies reviewed in this article are some of the first to evaluate the feasibility and safety of opportunistic, or total, salpingectomy for permanent contraception since the ACOG and SGO recommendations were published. Just as our community has adopted the common practice of opportunistic salpingectomy at the time of hysterectomy, we should continue to advocate for a similar practice when discussing permanent contraception. Additionally, the Westberg study provides good evidence that educational initiatives can influence provider practices, which upholds the data published by McAlpine and colleagues in British Columbia. This information is promising and valuable.



**Preoperative and postoperative anti-Müllerian hormone levels were similar for women undergoing partial or total salpingectomy at elective cesarean delivery**

Our universal goal as ObGyns is to provide the best reproductive health care possible based on the most recent evidence available. Continuing to advocate for oppor-

tunistic salpingectomy for permanent contraception purposes meets this goal and potentially provides significant noncontraceptive benefits. 

## WHAT THIS EVIDENCE MEANS FOR PRACTICE

This study was designed as a pilot trial to assess feasibility of enrollment, safety, and short-term ovarian reserve after salpingectomy for permanent contraception. Although the study is small and does not assess long-term effects, the findings are reassuring, especially in conjunction with other data.

A meta-analysis demonstrated no effect on ovarian reserve up to 18 months after salpingectomy based on AMH changes.<sup>19</sup> A 5-year follow-up evaluation of 71 women undergoing total laparoscopic hysterectomy with bilateral salpingectomy also showed no effect on ovarian reserve as measured by

multiple hormone levels including AMH and ultrasonographic findings.<sup>20</sup> Thus, it is highly unlikely that a permanent contraception procedure that does not include removal of the uterus will have long-term ovarian reserve effects.

Additionally, consistent with other trials, Ganer Herman and colleagues demonstrate a slightly increased operative time and no increased complications. The surgical technique used in the study reflects the concern for postoperative bleeding from the mesosalpinx, and methods that ensure excellent hemostasis with suture ligation were used.

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