

Original Article

Does Laparoscopic Tubal Sterilization cause Premature Menopause?

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ABSTRACT

Objective: Laparoscopic tubal sterilization is a commonly preferred contraceptive method in women. This surgical intervention can be associated with certain complications in the short term and it also has the risk of failure in the long term. On the other hand, relationship between laparoscopic tubal sterilization and premature menopause in the long term has not been elucidated. The present study addresses this subject.

Design: Retrospective cohort study

Setting: The local hospital of Ankara, Turkey

Subjects: The study group included 76 patients with the laparoscopic coagulation (Group 1) and 76 healthy women (Group 2).

Intervention: The study aimed to determine age at menopause between patients who underwent tubal sterilization using the laparoscopic coagulation method and the control group.

Main outcome measure: Age at menopause

Results: There was no statistically significant difference between the groups with regard to age of menopause (47.86 ± 1.72 vs. 48.19 ± 1.61 ; $p = 0.271$).

Conclusions: Tubal sterilization using the laparoscopic coagulation method does not result in premature menopause. However, further studies should focus on the effects of salpingectomy, which has proved to be protective against ovarian cancer.

KEY WORDS: contraception, menopause, sterilization

INTRODUCTION

Sterilization is a frequently used contraceptive method. This method is more commonly employed in females and can be performed employing various surgical approaches. These include laparoscopic, abdominal, and hysteroscopic approaches. Laparoscopic surgical approach is the most frequently employed method^[1]. In laparoscopic tubal sterilization, techniques such as coagulation, occlusion, or tubal excision are used^[1]. A combination of these techniques can also be used. However, coagulation is a more frequently preferred technique because of advantages such as experience of clinicians as well as shorter operation time.

Similar to all surgical interventions, comprehensive counseling must be provided to the women when employing this method. The outline of this counseling must include all perioperative complications and

problems (*i.e.*, anesthesia complications, bleeding, organ injury, and death)^[2]. In addition, a long-term counseling including outcomes would better reveal the safety and outcomes of the surgical approach. The long-term failure rate regarding the risk of pregnancy has been reported to be 0% in the first 3 years and 1.85% in 10 years^[2,3].

In our clinical practice, failure rate has been the first concern raised by women presenting with the desire to undergo tubal sterilization procedure; the risk of premature menopause has been the second-most frequently raised concern. The reason for this is that women feel more anxious about menopause with advancing age. Surgeons usually respond according to the theoretical knowledge that laparoscopic tubal sterilization does not cause premature menopause. The present study was conducted because of the lack of a study conducted on this subject in the literature.

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Table 1: Comparison of the groups with or without laparoscopic tubal sterilization

Parameter	LS tubal sterilization group (n = 76)		Control group (n = 76)		p-value
	Mean	SD	Mean	SD	
Parity	2.74	0.62	2.58	0.69	0.051
BMI (kg/m ²)	26.8	1.9	27.48	2.14	0.041
FSH (IU/l)	68.19	14.47	64.93	10.96	0.233
Age at menopause (years)	47.86	1.72	48.19	1.61	0.271

LS: laparoscopy; BMI: body mass index; FSH: follicle stimulating hormone; SD: standard deviation

MATERIALS AND METHODS

The research was designed as a retrospective cohort study. Patient records at a local hospital for the period between 2002 and 2016 were utilized. An approval was obtained from the local ethics committee (Ethics Committee Decision dated April 5, 2016, Issue number: 197). Medical data of women who presented with the desire to undergo tubal sterilization for contraception between 2002 and 2010 were reviewed. The study group consisted of patients who underwent laparoscopic tubal sterilization with the coagulation method as the most frequently preferred method. Medical records of these women for the period between 2010 and 2016 were reviewed. The patients who presented with climacteric complaints and then diagnosed with menopause between 2010 and 2016 were included in the study. The criteria for menopause were lack of menstrual cycle for the last 6 months and follicle-stimulating hormone (FSH) levels of >40 IU/l^[4].

The inclusion criteria of the study were as follows: not diagnosed with or received therapy for infertility, no history of ovarian surgery, non-smoking status, lack of a systemic disorder (*e.g.*, diabetes mellitus and hypertension), and absence of family history for premature menopause. Seventy-six women meeting these criteria were included in the study. The control group consisted of 76 healthy women meeting the same inclusion criteria.

Statistical Analysis

For statistical analyses, SPSS for windows version 15.0 (SPSS, Inc., Chicago, IL) was used. The one-sample Kolmogorov–Smirnov test was used to analyze normality for continuous variables. For comparison of continuous variables, the Mann–Whitney U-test was used. Data were presented as mean \pm standard deviation. A p-value of <0.05 was considered to be statistically significant.

RESULTS

Parity, FSH levels, and age at menopause did not significantly differ between patients who underwent

tubal sterilization using the laparoscopic coagulation method and the control group. Body mass index (BMI) was higher in the control group.

The mean age was 47.86 ± 1.72 years in the laparoscopic tubal sterilization group and 48.19 ± 1.61 years in the control group. The mean parity was 2.74 ± 0.62 and 2.58 ± 0.69 , the mean BMI was 26.8 ± 1.9 and 27.48 ± 2.14 ($p = 0.041$), and the mean FSH levels were 68.19 ± 14.47 IU/l and 64.93 ± 10.96 IU/l, respectively, in the laparoscopic tubal sterilization and control groups (Table 1).

The mean age at operation was 38.1 ± 1.86 years in the laparoscopic tubal sterilization group.

DISCUSSION

Tubal sterilization is a commonly preferred contraceptive method in women. Lower failure rate compared to other methods, the lack of need to take drugs every day similar to other oral contraceptives, and the absence of complications commonly observed with intrauterine devices are important factors for preferring tubal sterilization. However, due to the need for surgical intervention, surgeons must be proactive against many complications, and women must be informed accordingly.

Along with anesthesia-related complications during surgery, many other surgical complications such as intraoperative bleeding and injury to the adjacent organs may also occur. Respiratory problems and infectious complications may also occur after surgery.

Failure rate is extremely low in the long term^[5]. Whether laparoscopic tubal sterilization causes premature menopause in the long term is one of the most frequently asked questions among women. Until recently, we have managed these questions by informing patients that no clear studies on this subject exist in the literature, but such outcomes are not expected. The present study was conducted to provide women clearer answers about this subject; our findings indicate that laparoscopic tubal sterilization does not cause premature menopause.

Nelson *et al* compared 134 patients who

underwent bilateral tubal ligation in premenopausal period with 172 control subjects^[6]. After a 4-year follow-up period, no significant difference was found between the patients with regard to perimenopausal symptoms. The symptoms evaluated were hot flashes, decreased libido, and anxiety with increasing intensity with advancing age. The previous study did not intend to assess age at menopause. In addition, the study was conducted in perimenopausal women and set targets that were different from the present study by following the patients for 4 years. Another study using a similar design reported more common occurrence of perimenopausal symptoms in women that underwent tubal sterilization^[7]. In their study, Harlow *et al* examined the effects of tubal sterilization on menorrhagia and dysmenorrhea^[8]. Hormonal changes were also evaluated, although this was not the focus of the study. The results suggest that there is no significant difference between women with and without tubal sterilization with regard to hormonal changes. Another study conducted by Ercan *et al* examined the effects of tubal sterilization on ovarian reserves^[9]. FSH, luteinizing hormone, estradiol, anti-mullerian hormone, antral follicle count, and ovarian volume criteria were evaluated at baseline before sterilization and 3 months after surgery. No significant difference was found between the measurements. The present study focused on the ovarian reserve. In a similar study, Dede *et al*^[10] reported that bilateral tubal sterilization (electrocoagulation) had no effect on ovarian reserve and its function. On the other hand, the study conducted by Goynumer *et al* suggested that tubal sterilization using the same method decreased the ovarian reserve. As we glance at these studies, all examined ovarian reserve and function in women undergoing tubal sterilization with electrocoagulation method and focused mainly on perimenopausal symptomatology. The focus of the present study was age at menopause in women who underwent laparoscopic tubal sterilization with electrocoagulation method and the objectives of the study were set accordingly. This method was found to not change the menopausal age.

Our study evaluated the outcomes of coagulation method in laparoscopic sterilization. This is the most frequently used method since 1990s, when this method was introduced into our clinic for the first time^[1]. Therefore, we are unable to report data on other methods, which are rarely performed at our clinic. It is also obvious that many unknown factors could also affect menopause. We therefore suggest that our data and study sample are insufficient in this regard. In addition, BMI of the control population was higher than that of the study population. Mid-life obesity is

associated with a different menopausal experience, including associations with age at menopause^[11]. On the other hand, in both groups, age at menopause has not changed statistically significantly.

Bilateral salpingectomy has been preferred during tubal sterilization in recent years to avoid peritoneal and ovarian tumors^[12]. In the last 5 years, we prefer bilateral salpingectomy in patients presenting with the desire to undergo sterilization procedure. It can be considered that periovarian vascular structures could become injured during salpingectomy and, theoretically, such injuries could cause premature menopause by affecting the ovarian reserve. However, before drawing such conclusions, prospective, randomized studies should be conducted; alternatively, retrospective studies that are designed similar to the present study could be conducted in future.

CONCLUSION

Tubal sterilization using the laparoscopic coagulation method does not affect age at menopause. However, further studies should focus on the effects of salpingectomy use recently, which has proved to be protective against ovarian cancer.

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REFERENCES

1. Moss C, Isley MM. Sterilization: A review and update. *Obstet Gynecol Clin North Am* 2015; 42:713-724.
2. Baill IC, Cullins VE, Pati S. Counseling issues in tubal sterilization. *Am Fam Physician* 2003; 67:1287-1294.
3. Schollmeyer T, Talab Y, Lehmann-Willenbrock E, Mettler L. Experience of laparoscopic tubal surgery at the department of obstetrics and gynecology, University of Kiel, from 1999 through 2000. *JSL* 2004; 8:334-338.
4. Menopause: Full Guideline. National Collaborating Centre for Women's and Children's Health (UK). London: National Institute for Health and Care Excellence (UK); 2015 Nov 12.
5. Rackow BW, Rhee MC, Taylor HS. Training of residents in laparoscopic tubal sterilization: Long-term failure rates. *Eur J Contracept Reprod Health Care* 2008; 13:148-152.
6. Nelson DB, Sammel MD, Freeman EW, Gracia CR, Liu L, Langan E. Tubal ligation does not affect hormonal changes during the early menopausal transition. *Contraception* 2005; 71:104-110.
7. Visvanathan N, Wyshak G. Tubal ligation, menstrual changes, and menopausal symptoms. *J Womens Health Gen Based Med* 2000; 9:521-527.

8. Harlow BL, Missmer SA, Cramer DW, Barbieri RL. Does tubal sterilization influence the subsequent risk of menorrhagia or dysmenorrhea? *Fertil Steril* 2002; 77:754-760.
9. Ercan CM, Sakinci M, Coksuer H, Keskin U, Tapan S, Ergun A. Ovarian reserve testing before and after laparoscopic tubal bipolar electrodesiccation and transection. *Eur J Obstet Gynecol Reprod Biol* 2013; 166:56-60.
10. Dede FS, Dilbaz B, Akyuz O, Caliskan E, Kurtaran V, Dilbaz S. Changes in menstrual pattern and ovarian function following bipolar electrocauterization of the fallopian tubes for voluntary surgical contraception. *Contraception* 2006; 73:88-91.
11. Karvonen-Gutierrez C, Kim C. Association of mid-life changes in body size, body composition and obesity status with the menopausal transition. *Healthcare (Basel)*. 2016 Jul 13; 4(3).
12. Yoon SH, Kim SN, Shim SH, Kang SB, Lee SJ. Bilateral salpingectomy can reduce the risk of ovarian cancer in the general population: A meta-analysis. *Eur J Cancer* 2016; 55:38-46.