



Original Article

Experience With Opportunistic Salpingectomy During Vaginal Hysterectomy For Uterine Prolapsus

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ABSTRACT

Objective: The aim of this study was to evaluate the trend in uptake of salpingectomy at the time of vaginal hysterectomy after the Clinical Practice Statement of Society for Gynecologic Oncology and to assess the risk of operative/postoperative complications associated with salpingectomy during vaginal hysterectomy.

Material and Methods: Patients who underwent vaginal hysterectomy or vaginal hysterectomy with salpingectomy for uterine prolapsus between January 2010 and January 2018 were analysed. We divided the patients into two groups to see the change in the rate of opportunistic salpingectomy after a systemwide practice recommendation was issued. Group 1 consist of patients who were operated between 2010-2014, before recommendation of the Society of Gynecologic Oncology that favour salpingectomy and Group 2 consist of patients operated after that.

Results: From January 2010 to January 2018, a total of 1224 vaginal hysterectomies were performed. A total of 808 patients under 60 years old were included in the study. There was no difference in operating time, the median estimated blood loss, intraoperative complication and postoperative complication by the performance of salpingectomy ($P>0.05$). When we examine the changes in the rate of salpingectomy year by year, from 2014, the salpingectomy rates increased, being 4 % in 2013, 7 % in 2015, and 8 % in 2017 onward.

Conclusion: We report an increase in the rate of salpingectomy during vaginal hysterectomies from 3 % to 7.2 % after the recommendation of the Society of Gynecologic Oncology that favour salpingectomy but this increase is not as great as the increase during laparoscopic or abdominal hysterectomies.

Keywords: Complications; Salpingectomy; Society for Gynecologic Oncology; Vaginal Hysterectomy

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Introduction

Ovarian cancer is the leading cause of morbidity and mortality among gynecologic cancers and the lifetime risk of ovarian cancer is 1.4 % in the general population [1]. Despite numerous developments in laboratory and imaging technologies, ovarian cancer is typically diagnosed in advanced stages because of a lack of effective screening strategies [2]. Mutations in BRCA1 and BRCA2 tumour suppressor genes are used to detect patients who are at risk of ovarian cancer but it is insufficient because approximately 80 % of ovarian cancers occur in women without a known genetic predisposition to the disease [3].

BRCA1 and BRCA2 carriers have a high risk of ovarian cancer and risk-reducing salpingo-oophorectomy has been performed in this population according to guidelines for many years. These operations have provided too many pathologic specimens among asymptomatic women with the occult disease and examination of these pathologic specimens have improved our understanding of the ovarian carcinoma. We know that there are two types of ovarian cancer. Type 1 which represents 25 % of ovarian cancers are genetically stable and present at an early stage and Type 2 cancers are more aggressive and comprise the remaining 75 % of the ovarian cancers. Type 2 cancers include mixed mesodermal, endometrioid and serous cancers.

Traditionally, epithelial ovarian cancer was thought to originate from the ovarian surface epithelium [4]. However, the histopathologic study of the specimens suggests that serous carcinomas, the most lethal form of ovarian cancer, frequently originate from precursor lesions in the fallopian tubes. These early lesions are called serous tubal intraepithelial carcinomas (STICs) [5]. Serous cancers also express Mullerian biomarkers, which more closely resemble the fallopian tube, rather than the ovary [6]. These findings strongly suggest that high grade serous ovarian cancers are most likely originate from the fallopian tube, rather than the ovary [7,8]. This new evidence has caused many health care providers to advocate salpingectomy as a prevention method for ovarian cancer and recommendations were made regarding removal of the fallopian tube during gynecologic surgeries in women who had completed childbearing [9,10].

In September 2010 the Ovarian Cancer Research team recommended bilateral salpingectomy at the time of hysterectomy (even when the ovaries are being preserved) and bilateral salpingectomy in place of tubal ligation for women at general population risk for ovarian cancer prevention.

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This was followed by a similar recommendation from the Society of Gynecologic Oncology of Canada and in November 2013, the Society for Gynecologic Oncology issued a Clinical Practice Statement suggesting that in women who choose to retain their ovaries, salpingectomy should be considered at the time of hysterectomy or other pelvic surgery for women at average risk for ovarian cancer [11,12]. Most recently the American College of Obstetricians and Gynecologists (ACOG) published a statement supporting these recommendations [13]. With the effects of these recommendations opportunistic salpingectomy, which refers to the removal of the fallopian tubes at the time of surgery performed for other benign indications but in which the ovaries are preserved in situ, has become a common practice among gynecologic surgeons. Additionally, total bilateral salpingectomy as a method of tubal ligation has evolved as a practice change worldwide [14]. After these recommendations, fallopian tubes are commonly removed during laparoscopic and open hysterectomy to prevent ovarian and tubal cancer, but despite the recommendations from the Society for Gynecologic Oncology and ACOG, they are not routinely removed during vaginal hysterectomy due to perceptions of increased morbidity, difficulty or inadequate surgical training. One large retrospective cohort of more than 12,000 hysterectomies reported only 17 % of vaginal hysterectomies had salpingectomy performed [15].

The aim of this study was to evaluate the trend in uptake of salpingectomy at the time of vaginal hysterectomy after the Clinical Practice Statement of Society for Gynecologic Oncology and to assess the risk of operative/postoperative complications associated with salpingectomy during vaginal hysterectomy for a benign indication.

Materials and methods

This retrospective, multicenter cohort study was approved by the institutional review board at Tepecik Education and Research Hospital. The databases of two gynecology and obstetrics departments from Izmir (Departments of Tepecik Education and Research Hospital and Katip Celebi University School of Medicine) were reviewed retrospectively using patient charts. Patients who underwent vaginal hysterectomy or vaginal hysterectomy with salpingectomy for uterine prolapsus between January 2010 and January 2018 were analysed. All surgical procedures were performed by different surgeons and salpingectomy was performed due to the surgeon's preference. Hysterectomies with any oophorectomy, patients over 60 years old and under 18 years of age were not included in the study.

Information on patient age, parity, menopausal status, history of pelvic surgery and surgical factors such as surgical time, estimated blood loss and intra-operative and post-operative complications were also abstracted from the medical records. The duration of the surgery was calculated from the time of induction of anaesthesia until the end of the procedure. Blood loss was estimated by the surgeon by correlating preoperative and postoperative haemoglobin levels.

In these hospitals which medical records were analysed, Society of Gynecologic Oncology is the society that mostly followed by surgical staffs for oncologic interventions and its recommendations have important implications for daily surgical practice. Based on this, we divided the patients into two groups to see the change in the rate of opportunistic salpingectomy after a systemwide practice recommendation was issued. Group 1 consist of patients who were operated between 2010-2014, before recommendation of the Society of Gynecologic Oncology that favour salpingectomy and Group 2 consist of patients operated after that. The primary outcome was the comparison of rates of salpingectomy at the time of hysterectomy between two groups. Secondary outcomes included an additional length of time, intra-

operative and post-operative complications and estimated blood loss associated with prophylactic salpingectomy at the time of vaginal hysterectomy.

Statistical analysis;

Descriptive analyses were performed to characterize the sample and determine the additional length of time, estimated blood loss and intra-operative and post-operative complications associated with salpingectomy. Comparative analyses were then performed between vaginal hysterectomy and vaginal hysterectomy with salpingectomy groups. Rates of salpingectomy at the time of hysterectomy before and after the recommendation of the Society of Gynecologic Oncology were compared using χ^2 tests. All tests were two-tailed with a $P < 0.05$ considered statistically significant and all analyses were performed using SPSS (IBM Corp. released 2016. IBM Statistics, version 22.0).

Results

From January 2010 to January 2018, a total of 1224 vaginal hysterectomies were performed for benign pathologies. A total of 808 patients under 60 years old were included in the study. The majority of hysterectomies, 94.6 % (765/808), were performed without salpingectomy.

Bilateral salpingectomy was performed in only 43 patients (5.3 %).

Table 1. Clinical and demographic characteristics of patients

Characteristic	Vaginal Hysterectomy With Salpingectomy n:43 (5.4 %)	Vaginal Hysterectomy Alone n:765 (94.6 %)	P value
Age (mean)	55.5 (45–60)	56.1 (39–60)	NS
Parity (mean)	2.76 (0–7)	3.16 (0–8)	NS
Post-menopause, n (%)	34 (79.06)	643 (84.05)	NS
History of pelvic surgery, n (%)	3 (5.6)	46 (6)	NS
Intraoperative complication, n (%)	2 (4.6)	22 (2.8)	NS
Postoperative complication, n (%)	1 (2.3)	17 (2.2)	NS
Peroperative blood loss (mL)	460 (200–855)	450 (240–1055)	NS
Duration of surgery (s; mean)	134 (90–200)	128 (90–190)	NS

The median age at the time of hysterectomy was 56.1 years with women in the hysterectomy alone cohort and 55.5 in the hysterectomy with salpingectomy cohort. There was no significant association between opportunistic salpingectomy and age, parity, menopausal status or history of pelvic surgery (Table 1).

There was no difference in operating time, the median estimated blood loss, intraoperative complication and postoperative complication by the performance of salpingectomy ($P > 0.05$).

In the salpingectomy cohort, the mean blood loss was 460 mL (range, 200 -855 mL) and the mean duration of surgery was 134 min (range, 90 -200 min). In the hysterectomy alone cohort, the mean blood loss was 450 mL (range, 240 - 1055 mL) and the mean duration of surgery was 128 min (range, 90 -190 min).

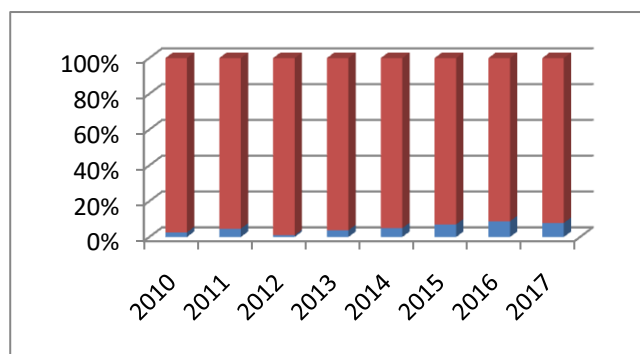
Table 2. Comparison of rates of salpingectomy at the time of vaginal hysterectomy

	Group 1 ^a	Group 2 ^b	P value
Hysterectomy alone	357 (97%)	408 (92.7%)	0,069
Hysterectomy with salpingectomy	11 (3%)	32 (7.3 %)	
^a operated between 2010-2014			
^b operated between 2014-2018			

In the salpingectomy cohort, there were 2 (4.6 %) intraoperative complications which defined as haemorrhage more than 500 ml and there was only 1 (2.3 %) postoperative complication (postoperative fever), but none of them was related to salpingectomy.

In the hysterectomy alone cohort, 22 (2.8 %) intraoperative and 17 (2.2 %) postoperative adverse events occurred and these adverse events were resolved within 10 days. There was no difference in intraoperative and postoperative complications between hysterectomy alone cohort and hysterectomy with salpingectomy cohort.

Figure 1. Percentage and number of vaginal hysterectomies with or without salpingectomies performed between 2010 and 2018.



	n:75	n:82	n:97	n:103	n:96	n:92	n:114	n:106
Hysterectomy alone	97 %	95 %	99 %	96 %	95 %	93 %	91 %	92 %
Hysterectomy with salpingectomy	n:2 3 %	n:4 5 %	n:1 1 %	n:4 4 %	n:5 5 %	n:7 7 %	n:11 9 %	n:9 8 %

When we compare Group 1 (patients who were operated between 2010-2014, before recommendation of the Society of Gynecologic Oncology that favour salpingectomy) and Group 2 (patients operated between 2014-2018 after recommendation of the Society of Gynecologic Oncology), there was a statistically significant increase in the rate of salpingectomy over time (Table 2).

When we examine the changes in the rate of salpingectomy year by year, from 2014, the salpingectomy rates increased, being 4 % in 2013, 7 % in 2015, and 8 % in 2017 onward (Figure 1).

Discussion

Recent studies show that the practice of opportunistic salpingectomy at the time of hysterectomy increased after the recommendations from the societies, especially the

Society for Gynecologic Oncology and the American College of Obstetricians and Gynecologists, that favour removing the fallopian tubes during a hysterectomy. During their study period, Garcia et al. found that 44.6 % of hysterectomies were performed with salpingectomy, mostly during laparoscopic procedures and when they compare their findings with previously reported rates they found a large increase in the rate of salpingectomy from 14.7 % to 72.7 % over the course of their study [15]. Similarly, in our study, we found an increase in performing salpingectomies during vaginal hysterectomy after the recommendations of these societies but this effect was minimal. The rate of salpingectomies performed increased from 3 % to 7.2 % during vaginal hysterectomies. These results are in concordance with previous studies. Garcia et al. demonstrated that in 16.5 % of cases, salpingectomy is performed with vaginal hysterectomy, while in 55.8 % of cases, salpingectomy is performed with hysterectomy via other routes.[15]

According to studies that have examined the surgeons' tendency about salpingectomy during vaginal hysterectomy, the majority of physicians not perform salpingectomies due to the affair of increase in complications, increased operating room time and increased estimated blood loss with the addition of salpingectomy [15,16]. But in our study, there was no difference in operating time, median estimated blood loss, intraoperative complication and postoperative complication by the performance of salpingectomy (P>0.05). Other studies reporting outcomes and complications of salpingectomy in women undergoing vaginal hysterectomy further support the safety of the procedure with no significant differences in operating room time, estimated blood loss, or other intraoperative complications [17]. There have been concerns that any risks of performing salpingectomy might not be worth the theoretical benefits. However, bilateral salpingectomy has been associated with an approximate 40–65 % reduction in future ovarian cancer incidence according to a meta-analysis [18]. On the other hand, one of the concerns raised is the potential compromise of ovarian vasculature and induction of premature ovarian insufficiency. However, several studies have challenged this theory since investigators have failed to observe a deleterious effect on ovarian function or blood flow after salpingectomy [19]. None of the studies focusing on anti-müllerian hormone, follicle stimulating hormone and antral follicle count before and after salpingectomy show any significant differences in comparison with hysterectomy only [20].

Other possible benefits of salpingectomy have been substantiated by increasing evidence such as possible risk reduction in the incidence of postoperative infectious complications and the need for resurgery for benign tubal disease [18,21].

Vaginal hysterectomy is the least invasive, safest option for hysterectomy. The American College of Obstetricians and Gynecologists recommends that hysterectomy should be performed by the vaginal route whenever possible [22]. With the recent demonstration of a tubal origin of most ovarian cancer and the protective effect of salpingectomy, removal of the fallopian tubes should be a policy during vaginal hysterectomy. Previous studies have demonstrated that salpingectomy is feasible in the majority of women through the vaginal route. Antosh et al. reported a success rate in performing salpingectomy of 81 % in their cohort of 69 patients [23]. Giraudet et al. demonstrate a surgical technique to make salpingectomy easier through the vaginal route [24]. They showed that salpingectomy at the time of vaginal hysterectomy seems to be most feasible if it is performed before the utero-ovarian and round ligaments are cut, which leaves the tube attached to the uterus and more accessible.

The main strengths of this study are its large sample size and

its sole focus on salpingectomies during vaginal hysterectomies. In addition, we add to the literature on the safety and feasibility of performance of salpingectomy during a vaginal hysterectomy with no clinical difference in operating time, blood loss or intraoperative and postoperative complication.

Our study also had some limitations. Firstly, although we included a total of 808 cases who underwent a vaginal hysterectomy, the low prevalence of salpingectomy in study population limited the statistical precision. The second limitation is the retrospective design of the study. We report an increase in the rate of salpingectomy during vaginal hysterectomies from 3 % to 7.2 % after the recommendation of the Society of Gynecologic Oncology that favour salpingectomy but this increase is not as great as the increase during laparoscopic or abdominal hysterectomies. Women undergoing vaginal hysterectomies should be counselled about the potential benefits of salpingectomy. Surgeons should not have to avoid the vaginal route when performing a hysterectomy if they are planning to include salpingectomy. But conversion to open or laparoscopic approach from a vaginal approach to perform prophylactic salpingectomy is not recommended.

Disclosure

Authors have no potential conflicts of interest to disclose.

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