Laparoscopic Supracervical Hysterectomy with Concomitant Bilateral Salpingectomy – Why not?

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Abstract. Aim: The aim of this investigation was to analyze the feasibility and postoperative outcome of laparoscopic supracervical hysterectomy (LASH) with and without bilateral salpingectomy. Patients and Methods: Between February and October 2012, a total of 25 patients were prospectively enrolled to undergo LASH with bilateral salpingectomy. A retrospective cohort of 25 matched patients who underwent LASH without bilateral salpingectomy at our Institution, performed by the same surgeon, served as the control collective. Results: Comparing both collectives, there were no statistically significant differences concerning overall hospital stay, duration of surgery and blood loss. Conclusion: LASH with bilateral salpingectomy is a fast and safe procedure.

In recent years the Fallopian tube became a matter of ongoing scientific debate, as the hypothesis was raised that serous ovarian and peritoneal carcinomas (pelvic serous carcinomas) might be of tubal origin. As it seems likely that a subgroup of pelvic serous carcinomas originate from the fimbriated ends of the Fallopian tubes, various researchers suggest a re-consideration of preventive and therapeutic strategies, proposing the removal of post-reproductive Fallopian tubes (1).

Non-oncologic morbidity of preserved Fallopian tubes in patients undergoing hysterectomy has also been investigated. The conclusion was drawn that the blind loop of the Fallopian tubes remaining after hysterectomy may act as a nidus of infection, leading to increased morbidity (2). Morse et al. estimated a lifetime risk of surgery due to complications in patients with a history of tubal sterilization undergoing hysterectomy with conservation of the adnexae of 7.8% (3). Potential complications due to tubal remnants are hydrosalpinx, tubal pregnancy, torsion, chronic pelvic inflammatory disease, salpingitis, pyosalpinx, tubal prolapse, tubo-ovarian abscess, benign and malignant tubal tumors (2-7).

The reasons for preservation of the ovaries with the distal Fallopian tube remnants in case of hysterectomy are unclear when reviewing gynecological textbooks (1). Physiologically, there is no reason for preservation of the Fallopian tubes as they loose their function as site of fertilization, transportation and early embryogenesis after hysterectomy or sterilization. Physiologically it is not clear if tubal conservation in case of hysterectomy has an impact on ovarian blood flow, which is normally based on a dual blood supply from the ascending branch of the uterine artery and corresponding ovarian artery. Some authors postulate adverse effects on ovarian function following tubal surgery (8, 9). However investigations on ovarian function after salpingectomy did not find any alterations neither in ovarian blood flow nor endocrinologic function (10-12). To our knowledge, long-term investigations concerning ovarian function after bilateral salpingectomy do not exist.

Based upon these data, bilateral salpingectomy in hysterectomy for benign diseases would seem beneficial for patients without known physiological disadvantages. Our aim was to analyze the feasibility and postoperative outcome comparing laparoscopic supracervical hysterectomy (LASH) with and without bilateral salpingectomy. To our knowledge this is the first prospective investigation concerning this topic.

Patients and Methods

Between February and October 2012, a total of 25 patients were prospectively enrolled in this study undergoing LASH with bilateral salpingectomy. A retrospective cohort of 25 matched patients who underwent LASH without bilateral salpingectomy at our Institution, performed by the same surgeon between 08/2010 and 12/2011, served as the control collective. It should be emphasized that the performing surgeon had experience of over 15 years in laparoscopic surgery.
surgery, so that a potential bias due to a learning curve throughout the study period was unlikely. The two cohorts were matched according to the parameters (age, body mass index, prior laparotomy) listed in Table I.

The study was approved by the Ethics Committee II of the Medical Faculty Mannheim, Heidelberg University (DRKS-ID: DRKS00003594). Written informed consent was obtained from all participants upon recruitment.

All laparoscopic surgeries were performed under general anesthesia. A 10 mm optic trocar was inserted beneath the umbilicus and two 5 mm trocars were placed laterally in the lower abdomen. Intraoperative pressure was 15 mmHg maximum. In the study group the salpinges were detached from the ovaries with a monopolar hook. In cases of insufficient hemostasis, a bipolar clamp was used for additional coagulation. Excising the tubes, special care was taken in order not to compromise the ovarian blood supply. Subsequently LASH was performed with bipolar instruments and scissors. In the control collective, LASH alone was accomplished. The uterus was extracted using an electric morcellator. The tubes were not morcellated and extracted separately via endoscopic bags.

Demographic parameters such as patient age, body mass index and previous laparotomy were collected before surgery. Indications for surgery, intra- and postoperative complications, duration of surgery and overall hospital stay were evaluated. The uterine weight was extracted from pathological records. Blood loss was measured via the suction tube. One case (1000 ml blood loss in the control group) was excluded from blood loss analysis due to extraordinary blood loss during surgery in order to avoid statistical bias. In seven cases (six patients of the control collective and one of the study collective), the blood loss had not been documented precisely.

All data were recorded in an Excel datasheet and transferred into SAS® environment (Statistical Analysis System, Release 9.2, SAS system, Cary, North Carolina, USA) for statistical analysis. Data are presented as mean ± standard deviation. Comparisons between study and control groups were accomplished using univariate tests (t-test and chi-square test). A p-value below 0.05 was considered statistically significant.

Results

Twenty-five women underwent LASH with bilateral salpingectomy due to benign causes from 02/2012 until 10/2012 at the University Medical Centre Mannheim, Heidelberg University, Germany. They were compared to a group of 25 matched patients treated with LASH only between 08/2010 and 12/2011. All 50 women were operated on by the same surgeon. Demographic and surgical parameters of the patients are shown in Table I. The majority of patients (39/50; 78%) suffered from uterine fibroids with bleeding disorders; 22% (11/50) underwent surgery due to bleeding disorders of unknown origin. There were no significant differences concerning demographic characteristics (Table I) or surgical parameters (Table II).

No conversion to laparotomy was necessary in either collective. In one woman of the control collective, severe bleeding (1000 ml) occurred during surgery, which was handled successfully. This case was excluded from blood loss analysis in order to avoid statistical bias. In cases in which the intraoperative blood loss was not precisely documented, the postoperative hemoglobin did not show significant changes. Except for this bleeding, no complications occurred during or after surgery in any of the investigated patients.

Discussion

In a study by Piek et al., prophylactic bilateral salpingo-oophorectomy (PBSO) in women with breast cancer type 1 or 2 susceptibility protein (BRCA-1 or -2) mutations demonstrated frequent dysplastic changes of the Fallopian tubes (13). In patients with and without BRCA1/2 mutations, serous intraepithelial tubal carcinomas were proven to co-exist with serous ovarian cancer in more than half of the examined cases (14). Furthermore, various investigations showed that gene expression profiles of Fallopian tube epithelium in patients with and without BRCA1/2 mutations correlated with known deregulations of oncogenic pathways characteristic for serous ovarian carcinoma (15, 16). Interestingly, p53 signatures as precursors of serous cancer in benign Fallopian tubes from women not belonging to a defined risk group were found in routine pathological examinations (17). Hence, as already mentioned above, it seems likely that pelvic serous carcinomas originate from the fimbriated ends of the Fallopian tubes, re-consideration of preventive and therapeutical strategies is warranted and the removal of post-reproductive Fallopian tubes has been proposed (1). To our knowledge, ours is the first prospective investigation analysing the feasibility of bilateral salpingectomy in laparoscopic hysterectomy. As shown in Table II, comparing both collectives there were no statistically significant differences concerning overall hospital stay, duration of surgery or blood loss. In our opinion LASH with bilateral salpingectomy is a fast and safe procedure.

Concerning BRCA1 and 2 mutation carriers, a meta-analysis by Rebbeck et al. revealed an 80% reduction in risk of ovarian/fallopian tube cancer and a 50% reduction in that for breast cancer by PBSO (18). For these patients, Leblanc et al., as well as Greene et al., suggest risk-reducing bilateral salpingectomy (solely or within hysterectomy) followed by postmenopausal bilateral oophorectomy (19, 20). Kwon et al. also suggest this therapeutical approach in a recent study with a Markov Monte Carlo simulation model comparing three strategies for risk reduction in women with BRCA mutations (21). In their study, PBSO, bilateral salpingectomy and bilateral salpingectomy with delayed oophorectomy were compared. Bilateral salpingo-oophorectomy was associated with the lowest cost and highest life expectancy compared with the other two strategies. When quality of life measures were included, salpingectomy followed by delayed oophorectomy yielded the highest quality-adjusted life expectancy with incremental cost-effectiveness ratio (21). It should be emphasized that the latter therapeutical approach
should still be considered experimental. Each case needs to be discussed carefully and therapeutic management planned individually according to the respective risks. Nevertheless, prophylactic salpingectomy in BRCA mutation carriers, or within hysterectomy in postreproductive patients (as performed in this investigation), is increasingly becoming a focus of ongoing scientific debate so that further feasibility studies are urgently needed.

**Conclusion**

Prophylactic bilateral salpingectomy in LASH is a safe and feasible procedure. Furthermore, reviewing the literature, bilateral salpingectomy within hysterectomy seems to be beneficial for patients.

**References**


**Table I. Demographic characteristics of the study (n=25) and control (n=25) collectives.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study collective (mean±SD)</th>
<th>Control collective (mean±SD)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>49.8±6.2</td>
<td>47.6±4.6</td>
<td>0.164+</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>25.0±4.0</td>
<td>26.5±5.6</td>
<td>0.259+</td>
</tr>
<tr>
<td>Number of patients with prior abdominal surgery</td>
<td>5/25 (20%)</td>
<td>5/25 (20%)</td>
<td>&gt;0.999*</td>
</tr>
</tbody>
</table>

BMI: Body mass index. +Based on two sample t-test; SD= standard deviation, *chi-square test.

**Table II. Surgical parameters of the study (n=25) and control (n=25) collectives.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study collective (mean±SD)</th>
<th>Control collective (mean±SD)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine weight (g)</td>
<td>200.0±220.5</td>
<td>188.0±143.0</td>
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<td>Overall hospital stay (days)</td>
<td>3.16±0.37</td>
<td>3.44±0.65</td>
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<tr>
<td>Duration of surgery (min)</td>
<td>106.3±46.4</td>
<td>115.3±43.41</td>
<td>0.233</td>
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<td>Blood loss (ml)</td>
<td>45.6±28.0 (n=24)</td>
<td>100±150.8 (n=18)</td>
<td>0.267</td>
</tr>
</tbody>
</table>

SD=Standard deviation, p-Values based on two sample t-test.


Received March 9, 2013
Revised May 18, 2013
Accepted May 20, 2013