

Combined hysterectomy/salpingo-oophorectomy and mastectomy for female-to-male transgender persons: a retrospective update

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ABSTRACT

Purpose: Mastectomy and hysterectomy with bilateral salpingo-oophorectomy are the first steps in surgical female-to-male (FtM) gender affirmation. We aimed to critically review our experience with the combined approach of hysterectomy/salpingo-oophorectomy and bilateral mastectomy, focusing in particular on intra- and postoperative complications.

Methods: In a retrospective cohort study, 108 consecutive patients were included, who underwent combined hysterectomy, bilateral salpingo-oophorectomy, and bilateral mastectomy in a single operating session, between November 1998 and December 2017. The main outcome measures were operating times and intra- and postoperative courses, including major and minor adverse events.

Results: The patients were 28.9 ± 6.7 years of age and had a mean BMI of 24.4 ± 4.1 kg/m². The median total operating time for patients without additional procedures was 237.6 ± 110.3 minutes. Taking all intra- and postoperative complications together, there were eight (7.4%) and 21 (19.4%) patients with major and minor complications, respectively. The most frequent complication was breast hematoma (18/108, 16.7%). The intra- and postoperative course was completely uneventful in 82 cases (75.9%).

Conclusions: For FtM reassignment surgery, the approach herein described, of combined hysterectomy/salpingo-oophorectomy and bilateral.

KEYWORDS

Transmen, gender reassignment surgery, hysterectomy, mastectomy, complications.

Introduction

Mastectomy and hysterectomy with bilateral salpingo-oophorectomy are frequently performed surgical procedures in the context of female-to-male gender affirmation^[1] and contribute to increased quality of life of transmen^[2].

In 2010, we reported the results of a preliminary data set and concluded that our method, consisting of combined hysterectomy/salpingo-oophorectomy and bilateral mastectomy in a single operating session, was safe and feasible for transmen^[3].

Notably, a recent analysis compared the vaginal and laparoscopic approaches. The authors concluded that both were safe with only minimal complications, but preferred vaginal hysterectomy, since laparoscopy was associated with longer operating time, higher cost, and scars in the anterior abdominal wall^[1]. However, the special requisites and conditions of transmen have not been addressed in reviews dealing with the various approaches for hysterectomy.

We therefore believe that a second critical review of our combined technique is now warranted, since many more transmen have undergone surgery at our department within the last several years, and also as a contribution to an ongoing discussion about the best surgical approach for transmen with a wish

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to have the inner genitals removed. Thus, it was the aim of the present cohort analysis to evaluate the overall intra- and postoperative complication rate of our combined hysterectomy/salpingo-oophorectomy and bilateral mastectomy approach. Additionally, we looked at intraoperative lesions or injuries to the vaginal epithelium, since supraphysiological androgen exposure leads to higher vulnerability of the vaginal epithelium.

Materials and methods

We included a total of 108 consecutive patients who underwent combined hysterectomy, bilateral salpingo-oophorectomy and bilateral mastectomy in a single operating session at our

department between November 1998 and December 2017. The study was approved by the local ethics committee (IRB number 1590/2016).

Details of the management prior to surgery and the standard surgical techniques for both laparoscopic hysterectomy with bilateral salpingo-oophorectomy and bilateral mastectomy have been published previously^[3]. Typically, a total laparoscopic hysterectomy was performed, except in a few cases of patients who instead opted for a supracervical approach, which was performed according to previous reports^[4]. These patients had explicitly asked for this approach to avoid scar formation at the vaginal cuff, as further surgical procedures for penile reconstruction/phalloplasty were planned. For supracervical hysterectomy, a Spackmann Intra-uterine™ manipulator with clamp fixation and an adjustable rubber cone (Nr. 1264, WIS-AP Medical Technology GmbH, Brunenthal/Hofolding, Germany) was always used. This same device was also used for total laparoscopic hysterectomy, as follows: in all cases in the period 1998–2008, and thereafter, only in cases with a very narrow vaginal introitus. Otherwise, from 2009 to 2017, a HOHL manipulator™ with a portio-surrounding cap of 28 mm diameter (KARL STORZ SE & Co. KG, Tuttlingen, Germany) was used for the total laparoscopic procedures. This preference for the HOHL manipulator™ was due to a change in the laparoscopic team. Mastectomy was performed either with a periareolar approach or with primary excision of medial and lateral skin and free nipple areola complex grafting. The technique was chosen based on the size of the breast and has been reported in detail previously^[3].

We analyzed operating times and intra- and postoperative courses, including major adverse events (conversion to laparotomy, bowel/ureter/bladder injury, admission to an intensive care unit, secondary surgery, or bleeding that caused healing disturbances or that required blood transfusions, fever >38.0°C, pulmonary embolism, major anesthesia problems, wound de-

hiscence) and minor adverse events (injury to the vaginal epithelium, postoperative urinary tract infection, allergic reaction to any medication, sensitivity reduction of the extremities due to incorrect positioning during the operation, postoperative hematomas or wound infections that did not affect the wound healing process or the cosmetic result, increased body temperature <38.0°C)^[3,5].

Variables are described by numbers and frequencies or mean ± standard deviation. A paired t-test was performed to test for differences between pre- and postoperative values. Differences in postoperative complication rates between the two groups were analyzed using chi-square or Fisher's exact test. A *p*-value < .05 was considered statistically significant. Statistical analysis was performed in SPSS 25.0 for Windows (SPSS Inc, 1989–2018).

Results

The basic patient characteristics are provided in Table 1. All patients had been diagnosed and treated according to the Austrian national regulations for gender-affirmative treatment, and had been under cross-sex hormonal treatment for a mean of 17.5 ± 8.8 months. The indication for sex reassignment surgery was confirmed by a psychiatrist, as well as a psychotherapist or clinical psychologist, according to the standards of the Austrian national regulations.

In all but 4 cases, laparoscopy was performed prior to mastectomy (104/108, 96.3%). In the four exceptions, the order had to be reversed for logistic reasons. Antibiotic treatment was given according to the microbiologic recommendations of the General Hospital of Vienna. All patients received one-shot intravenous antibiotic prophylaxis about 15 minutes before skin incision. In 99 patients (91.7%), cefuroxime (1.5 g) was administered. The other antibiotic regimens were cefoxitin

Table 1 Overview of basic patient characteristics and perioperative outcomes.

Age at surgery (years)*		28.9 ± 6.7
Body mass index (kg/m ²)*		24.4 ± 4.1
Preoperative androgen treatment (months)*		17.5 ± 8.8
Gravidity [#]	0	105 (97.2)
	1	2 (1.9)
	≥2	1 (0.9)
Parity [#]	0	107 (99.1)
	≥1	1 (0.9)
Wish to have further genital surgery [#]		77 (71.3)
Operating time (minutes)**	Total	237.6 ± 110.3
	Laparoscopy	82.8 ± 23.0
	Mastectomy	128.1 ± 113.9
	Repositioning between the two procedures	28.8 ± 5.7
<i>Numerical data are presented as *mean ± standard deviation, categorical data as #number (frequency); **patients with additional surgical procedures were excluded from this analysis</i>		

(n = 5, 4.6%), amoxicillin and clavulanate (n = 3, 2.8%), and cefotiam (n = 1, 0.9%). Antibiotic treatment postoperatively was administered only when indicated or on suspicion of infection. None of the patients wanted to keep the ovaries. In all patients, hysterectomy and bilateral salpingo-oophorectomy was planned and started with laparoscopy. In three cases, intraoperative conversion to laparotomy appeared to be necessary (in one patient for a large ovarian dermoid cyst and in two patients due to massive intraabdominal adhesions as a result from previous laparotomies). After close consultation with the plastic surgeon, eight patients (7.4%) opted for supracervical hysterectomy in order to avoid scar formation at the vaginal cuff, as further surgical interventions for penile construction/phalloplasty with vaginal flaps were planned. A total laparoscopic hysterectomy was performed in the remaining 100 patients (92.6%). The Spackmann Intra-uterine™ manipulator was used in 59 cases (54.6%). A mastectomy with free nipple areola complex grafting was performed in only 45/108 patients (41.7%), whereas in 63 patients (58.3%), the periareolar technique was used. In one patient, an additional surgical procedure not related to the transitional trajectory was performed: in this 22-year-old patient, an enlarged lymph node in the right axilla was removed. Frozen section revealed a benign result.

Details on operating times are shown in Table 1. When a HOHL manipulator™ was used, hysterectomy and bilateral salpingo-oophorectomy turned out to be significantly shorter than with the Spackmann Intra-uterine™ manipulator (77.6 ± 20.5

minutes versus 87.5 ± 24.0 minutes; $p = 0.029$).

The intraoperative course was uneventful for the majority of patients (100/108, 92.6%). Table 2 provides details on perioperative complications. Intraoperative adverse events occurred in only eight patients (7.4%):

- in three patients, an incision of the hymen became necessary to widen a very narrow vaginal introitus to enable placement of the HOHL manipulator™;
- in two patients, small, superficial vaginal lacerations occurred during placement of the HOHL manipulator™, requiring hemostatic stitches;
- in one patient, removal of an ovarian dermoid cyst appeared not feasible vaginally, and therefore a Pfannenstiel laparotomy was performed;
- in another patient, conversion to a median re-laparotomy appeared necessary due to massive intra-abdominal adhesions due to previous bowel surgery;
- in another patient, diffuse bleeding during periareolar mastectomy occurred with an estimated intraoperative blood loss of about 800 ml and immediate requirement of two transfusions of packed red blood cells. This was the only patient who required intraoperative blood transfusions.

Twenty-two patients (20.4%) suffered from one or more postoperative complications. In detail, 18 patients (16.7%) had a breast hematoma, five (4.6%) received packed red blood cell transfusions postoperatively due to a significant hemoglobin drop and hemodynamic instability, revision of the breast was

Table 2 Intra- and postoperative outcomes.

Perioperative complications			
Patients with at least one major complication		8 (7.4)	
Major complications [#]	Conversion to laparotomy		2 (1.9)
	Intraoperative bleeding requiring blood transfusion		1 (0.9)
	Breast hematoma requiring re-intervention		5 (4.6)
	Vaginal cuff hematoma requiring re-intervention		1 (0.9)
	Breast hematoma requiring blood transfusion		5 (4.6)
Patients with at least one minor complication (but without major complications)		18 (16.7)	
Minor complications [#]	Incision of the hymen		3 (2.8)
	Vaginal laceration		2 (1.9)
	Breast hematoma not requiring re-intervention		13 (12.0)
	Postoperative allergic reaction (to anal-gesic treatment)		2 (1.9)
	Postoperative urinary tract infection		1 (0.9)
	Sensitivity reduction of the left lower ex-tremity		1 (0.9)
Short-term re-admission to hospital [#]		0	
Perioperative course of blood count			
	Preoperative	Postoperative	<i>p</i>
Hematocrit (%) [*]	45.4 ± 4.9	35.7 ± 6.4	<0.001
Hemoglobin (g/dL) [*]	15.0 ± 1.6	12.5 ± 1.5	<0.001
Numerical data are presented as *mean ± standard deviation, categorical data as #number (frequency); # patients with additional surgical procedures were excluded from this analysis			

necessary in four cases (3.7%), and one patient (0.9%) was punctated for a breast hematoma. More specifically, breast hematomas occurred in 13/63 (20.6%) cases after mastectomy with a periareolar approach and in 5/45 (11.1%) cases after free nipple areola complex grafting ($p = 0.295$). In two of the patients with breast hematoma, mastectomy had preceded laparoscopy (2/4, 50.0%), whereas 16/104 (15.4%) breast hematomas occurred after the laparoscopy-first technique ($p = 0.129$). Moreover, one patient (0.9%) suffered from a hematoma of the vaginal cuff, the extent of which was confirmed by computer tomography on the first postoperative day. Under sedo-analgesia, the hematoma was drained vaginally and a small t-drain was placed. Details on other minor postoperative complications are provided in Table 2. Summarizing all intra- and postoperative complications, a completely uneventful intra- and postoperative course was found in 82 cases (75.9%).

Breast suction drains were removed after a mean of 2.9 ± 1.1 postoperative days. None of the patients required re-admission to hospital.

Discussion

The majority of the transmen who underwent hysterectomy, salpingo-oophorectomy and mastectomy experienced uneventful intra- and postoperative courses (75.9%). Only 7.4% of patients were affected by major complications, with breast hematoma found to be the most common adverse event.

The technique presented herein combines two surgical interventions in one session. Hypothetically, this might increase the risk of complications, and, thus, must be considered when comparing our results with previous studies. Previous studies of hysterectomy performed laparoscopically or vaginally in transmen have reported rates of non-specific and hysterectomy-related complications in the range of 0–12.5%^[1,6,9,10,11]. The wide range of complication rates seems noteworthy and might be due to differences in the sizes of the reported populations, and also to insufficient data quality of retrospective studies. In addition, after mastectomy, complication rates of 5.0–13.6% have been shown^[12,17]. Notably, breast hematoma has already been reported to be the most frequent adverse event after mastectomy in transmen^[12].

In the present report, we also focused on perineal/vaginal lacerations as a rare adverse event in the course of a laparoscopic hysterectomy. In three patients with a particularly narrow vaginal introitus, hymeneal incision appeared necessary to achieve access to the cervix for correct placement of the uterine manipulator. In two patients (1.9%), small, superficial vaginal lacerations occurred during placement of the HOHL manipulatorTM, and in one during use of the Spackmann manipulator. A small but significant reduction in the laparoscopic operating time was achieved with the use of the HOHL manipulatorTM, specifically, by a mean of 10 minutes. From our experience, the portio-surrounding cap of most uterine manipulators can be too large for a narrow vaginal introitus. We believe that this leaves room for improvement at laparoscopic units, and we are constantly in search of optimal instruments. Although use of the vaginal epithelium for urethral lengthening is not considered

current standard practice according to the World Professional Association for Transgender Health (WPATH; available online at: <https://wpath.org/publications/soc>), avoidance of lesions of the vaginal epithelium and consequent microscarring might be relevant for fully competent vaginal flaps or possibly for secondary surgical interventions treating stenosis or fistulas. We are aware of reports stating that vaginal hysterectomy and/or episiotomy does not compromise future vaginal flaps^[1], but we still think that avoidance of micro traumata of the vaginal epithelium might be advantageous. The above-mentioned lacerations became evident due to visible vaginal bleeding at the end of the operation. Vaginal examination in case of vaginal bleeding after using a uterine manipulator is part of the standard operating procedures of our department. In former times patients, underwent examination postoperatively and prior to hospital discharge. This general policy has been abandoned for more than a decade. Moreover, for transmen vaginal examination without clear added value is regarded as obsolete. Probably, therefore, additional non-bleeding lacerations were missed. This circumstance needs to be seen as a study limitation.

Mastectomy is one of the most important surgical procedures for transmen, since the contour of the breast is an obvious female attribute^[12]. Notably, in our last report on the combined reassignment procedure, we raised the question, and concern, of whether the surgical order of mastectomy first, followed by laparoscopy, could lead to an increased risk of breast hematoma compared with its reversal^[12]. Having overseen a larger number of combined procedures, our former concerns cannot be confirmed. No significant difference in breast hematoma rates was found between the two groups. However, only four patients underwent a mastectomy-first procedure. Therefore, we consider the sample size in the latter group too small to derive a valid conclusion. Moreover, we did not observe a difference in breast hematoma incidence between the periareolar approach and the approach with primary excision of medial and lateral skin and free nipple areola complex grafting, which is in line with a recent report^[16] but in contrast to the previous study by our group, in which all breast hematomas were observed after mastectomy with a periareolar approach^[3]. In five cases, a re-intervention became necessary. Since this might compromise the esthetic outcome by leading to nipple necrosis and abscess formation^[10] and, empirically, burdens the affected patient with worries and distress, it represents an important complication. Fortunately, the rate (4.6%) was low compared with those reported in the previously published literature^[11-16]. In our study population, there was a significant decline, from preoperative to postoperative, in hematocrit and hemoglobin levels. This decline is believed to be likely due to intraoperative blood loss during mastectomy and not during laparoscopy, which seems supported by the literature^[1,6,8-10,12-17]. However, only six of the patients required blood transfusions. It seems noteworthy that preoperative values were quite high, which was likely due to the erythropoietic effects of androgens that had been administered in supraphysiological regimes.

We feel that our combined surgical approach is of added value for transmen for several reasons. Furthermore, since the patient would require general anesthesia only once with our procedure, we believe that this is a further advantage of our

method^[3]. We have learned that these transmen, in particular, usually prefer to undergo as few inpatient stays as possible. Our patients seem pleased with the opportunity of a combined procedure, with only one hospital stay, reduced recovery time and, probably even more important, with general anesthesia needed only once, the latter empirically being what patients generally fear most.

Sometimes it is argued that the increased operating time may put the patient at higher risk. Except for patients with severe comorbidity, this hypothesis has never been substantiated. Moreover, the majority of our transmen patients underwent these surgical interventions at a young age (mean 29 years), at which they should be able to tolerate a mean total operating time of about 240 minutes without complications. Thus, all in all, we consider the combined method beneficial for these patients.

In conclusion, we consider our procedure of combined hysterectomy/salpingo-oophorectomy, and bilateral mastectomy in a single operating session to be feasible, safe, and valuable for transmen. A completely uneventful intra- and postoperative course was found in about 76% of cases. Combining these two routine procedures seems to meet the needs of this patient population, as also reported previously^[3].

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