Article

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

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ABSTRACT: 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 and to focus on intra- and postoperative complications. 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. Main outcome measures were operating times and intra- and postoperative courses, including major and minor adverse events. Patients were 28.9 ± 6.7 years of age and revealed 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%). There was a completely uneventful intra- and postoperative course in 82 cases (75.9%). In conclusion, for FtM reassignment surgery, the combined hysterectomy / salpingo-oophorectomy and bilateral mastectomy in a single operating session seems to be feasible and safe.

Keywords: transsexuals; hysterectomy; mastectomy; reassignment surgery

1. 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 procedure 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 the laparoscopic approaches. The authors concluded that both were safe with only minimal complications, but preferred vaginal hysterectomy, since laparoscopy was associated with longer operative 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 about the various approaches for hysterectomy.

We therefore believe that a second critical review of our combined technique is of value, since many more transmen have undergone surgery at our department within the last several years, and as a contribution to an ongoing discussion about the best surgical approach for transmen with a wish 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 as supraphysiological androgen exposure leads to higher vulnerability of the vaginal epithelium.

2. Material 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 about 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]. But, typically, a total laparoscopic hysterectomy was performed, except for a few cases of patients opting for a supracervical approach, which was performed according to previous reports [4]. For the latter, a Spackmann Intra-uterine™ manipulator with clamp fixation and an adjustable rubber cone (Nr. 1264, WISAP Medical Technology GmbH, Brunnthal/Hofolding, Germany) was used. From 1998-2008, in all cases, and thereafter, in case of a very narrow vaginal introitus, the same device was used for total laparoscopic hysterectomy. Otherwise, a HOHL manipulator™ with a portio-surrounding cap of 28mm diameter (KARL STORZ SE & Co. KG, Tuttlingen, Germany) was used from 2009-2017. 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 focused on operating times and intra- and postoperative courses, including major (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 dehiscence) and minor adverse events (injury to the vaginal epithelium, postoperative urinary tract infection, allergic reaction to any medication, sensibility 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 (SD). 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 analysed 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).

3. Results

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 were 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.

Table 1. *Overview on basic patient characteristics and perioperative outcome.*

Age at surgery (years)*		28.9 ± 6.7
Body mass index (kg/m²)*		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 both procedures	28.8 ± 5.7

Numerical data are presented as *mean ± standard deviation, categorical data as #number (frequency); +patients with additional surgical procedures were excluded for this analysis

In all but 4 cases laparoscopy was performed prior to mastectomy (104/108, 96.3%). The order had to be reversed for logistic reasons in four patients. 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 (1.5g) was administered. Other antibiotic regimens included cefoxitin (n= 5, 4.6%), amoxicillin and clavulanate (n= 3, 2.8%), and cefotiam (n= 1, 0.9%). Antibiotic treatment postoperatively was only administered when indicated or on suspicion of infection.

None of the patients wanted to maintain 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). In sound 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 with vaginal flaps were planned. A total laparoscopic hysterectomy was performed for 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. Using a HOHL manipulator™, hysterectomy and bilateral salpingo-oophorectomy turned out to be significantly shorter than with the Spackmann Intra-uterineTM 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 were found only for eight patients (7.4%): (i) in three patients, an incision of the hymen had become necessary to widen a very narrow vaginal introitus enabling placement of the HOHL manipulator™; (ii) in two

patients, small, superficial vaginal lacerations occurred during placement of the HOHL manipulator™, requiring hemostatic stitches; (iii) in one patient, removal of an ovarian dermoid cyst appeared not feasible vaginally, and, thus, a Pfannenstiel laparotomy was performed; (iv) in another patient, conversion to a median re-laparotomy appeared necessary due to massive intraabdominal adhesions due to previous bowel surgery; and (v) in another patient, diffuse bleeding during periareolar mastectomy occurred with an estimated intraoperative blood loss of about 800ml and immediate requirement of transfusion of two packed red blood cells. This was the only patient who required intraoperative blood transfusions.

Table 2. *Intra- and postoperative outcome.*

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 analgesic treatment)		2 (1.9)
	Postoperative urinary tract infection		1 (0.9)
	Sensibility reduction of the left lower extremity		1 (0.9)
Short-term re-admission to hospital#			0
Perioperative course of blood count			
	Preoperative	Postoperative	p
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 for this analysis

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 cells transfusion postoperatively due to a significant hemoglobin drop and hemodynamic instability, revision of the breast was 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 there were 16/104 (15.4%) breast hematomas 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 postoperative minor 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 time of 2.9 ± 1.1 postoperative days. None of the patients required re-admission to the hospital.

4. 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 hematomas the most common adverse event.

The technique presented herein combines two surgical interventions in one session. Hypothetically, this might increase the risk for complications, and, thus, must be considered when comparing our results with previous studies. In previous studies of hysterectomy that had been performed laparoscopically or vaginally in transmen, rates of non-specific and hysterectomy-related complications of 0-12.5% have been reported [1,6,8,9,11]. The wide range of complication rates seems noteworthy and might be due to differences in the sizes of the reported populations and also due 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 manipulator™. A small but significant reduction in the laparoscopic operating time was achieved with the use of the HOHL manipulator™, 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 do believe that this leaves room for improvement at laparoscopic units and we are constantly in search for optimal instruments. Although vaginal epithelium for urethral lengthening is not considered current standard 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 consecutive microscarring might be relevant for fully competent vaginal flaps or possibly applicable 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 left since more than a decade. Moreover, for transmen vaginal examination without clear added-value is regarded obsolete. Probably there have been additional non-bleeding lacerations 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 concern whether the surgical order ofmastectomy first, followed by laparoscopy, would lead to an increased risk for breast hematoma compared to its reversal [3].

Overseeing a larger number of combined procedures our former concerns cannot be confirmed. There is no significant difference in breast hematoma rates 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 or 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 of our own group where all breast hematomas had been found after mastectomy with a periareolar approach [3]. In five cases, a re-intervention became necessary. Since this might compromise aesthetic outcome by leading to nipple necrosis and abscess formation [11] and, empirically, burdens the affected patient with worries and distress, it represents an important complication. Fortunately, the rate of 4.6% was low compared to the previously published literature [12-17]. In our study population, there was a significant decline from the preoperative to postoperative hematocrit and hemoglobin levels. It is believed that this decline is likely due to intraoperative blood loss during mastectomy and not during laparoscopy which seems supported by the literature [1,6,8,9,11-17]. 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 supra-physiological 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 especially these transmen, thus, 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, 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 a 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 an early age (mean 29 years) and should, thus, tolerate a mean total operating time of about 240 minutes without complications. Thus, all in all, we consider the combined method beneficial for the 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].

Conflicts of Interests: JO received remuneration for lecturing from Lenus Pharma GesmbH outside the current research field. All other authors declare that they have no competing interests.

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