

A Study on Symptoms of Pelvic Floor Dysfunction in Assigned Female at Birth Patients Diagnosed with Gender Dysphoria Undergoing Vaginectomy

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Background: A person diagnosed with gender dysphoria who was assigned female at birth (AFAB) may request a vaginectomy as part of gender-affirming treatment. The aim of this study was to investigate the impact of vaginectomy on symptoms of pelvic floor dysfunction (PFD).

Methods: This is a cohort study on patient-reported symptoms of PFD in patients who were AFAB, diagnosed with gender dysphoria, and undergoing vaginectomy in a single surgical center. Patients responded to a questionnaire preoperatively and 1 year postoperatively. The questionnaire consisted of 33 questions, including a modified short-form version of the Pelvic Floor Distress Inventory (PFDI-20).

Results: Twenty-three consecutive patients were included in the study and 20 patients (87%) completed the 1-year follow-up. The preoperative median PFDI-20 score was 24 (0–114) compared with 32 (0–168) at the 1-year follow-up ($P = 0.07$). Patients who had previously undergone neophallus construction with a metoidioplasty ($n = 15$) had no significant change between the preoperative and the 1-year postoperative PFDI-20 score [median 17.5 (0–114) and 27.5 (0–145) ($P = 0.65$), respectively]; whereas those with a groin flap phalloplasty ($n = 5$) had a significant increase in reported symptoms [median 37 (10–95) and 124 (45–168), respectively ($P = 0.04$)].

Conclusions: Overall, vaginectomy could be performed without any major impact on symptoms of PFD. However, this seemed to be true mainly for patients with previous metoidioplasty, whereas patients with previous groin flap phalloplasty reported worsening of symptoms. (*Plast Reconstr Surg Glob Open* 2024; 12:e5950; doi: 10.1097/GOX.0000000000005950; Published online 2 July 2024.)

INTRODUCTION

Gender dysphoria (GD) is a term used to describe the condition of a person whose gender identity is incongruent with that person's assigned sex at birth.¹ For the assigned female at birth (AFAB) person diagnosed with GD, treatment may include gender-affirming surgery (GAS) as a means of aligning external sexual characteristics to those

of a cis-male.² Several surgical options are available and can generally include mastectomy; the creation of a neophallus (with or without scrotal construction) through one of a plethora of methods [eg, free or pedicled flaps, metoidioplasty (MP)]; hysterectomy with bilateral salpingo-oophorectomy; and vaginectomy.^{3–5}

Vaginectomy, also referred to as colpectomy, is a surgical procedure involving the total excision and/or fulguration of the vaginal epithelium, adaptation of the levator ani muscles, and subsequent obliteration of the remaining vaginal wound cavity. In an AFAB GD patient, the procedure aims to create a male-like perineum. Vaginectomy may be requested for a variety of reasons (eg, due to psychological reasons), as the vagina is a strong symbolic factor in the female identity, or due to uncomfortable secretions that can occur, especially during sexual arousal.

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Vaginectomy has also been reported to lower the risk of neourethral fistulae^{6–8} and is for this reason a prerequisite for urethral lengthening (UL) in some centers. The procedure currently has few other indications and is rarely performed beyond the context of GAS.

The vaginectomy can be undertaken either through a perineal or abdominal approach, the latter often laparoscopically with or without robotic assistance.^{9–11} Many surgeons consider the operation a high-risk procedure^{4,10–12} due to the very rich blood and nerve supply of the vagina as well as its proximity to both the urinary and gastrointestinal tracts and their respective sphincters. The few studies published on AFAB GD patients undergoing vaginectomy confirm the risk of postoperative bleeding. Weyers et al reported that 5.7% of vaginectomized AFAB GD patients needed reoperations due to perineal hematoma, as well as instances of perioperative damage to the urinary bladder and rectum, the latter requiring temporary colostomy in some cases.^{12,13}

Vaginectomy is, in fact, partly a reconstruction of the pelvic floor, which is a complex musculofascial structure involved in several of the physiological functions of the pelvi-perineal area (eg, micturition and defecation).¹⁴ Symptoms of pelvic floor dysfunction (PFD) have been shown to be a cause of decrease in quality of life (QoL) in cis-women.^{15,16} Previous studies on vaginectomy in AFAB GD patients focus on the surgical method and most often present only descriptive data. To our knowledge, there are no studies that address the impact that vaginectomy may have on the physiological functions of the pelvic floor, and how changes in these functions may affect QoL. Studies in cis-women undergoing pelvic floor surgery have shown that the outcome is not always predictable and may lead to new symptoms associated with the pelvic floor.¹⁷ With the present study, we aimed to evaluate the effect of vaginectomy on the symptoms of PFD and to describe the risks and types of complications related to the vaginectomy procedure in our surgical center for GAS.

METHODS

This is a cohort study comparing patient-reported symptoms regarding PFD and QoL before and one year after having undergone vaginectomy. Approval for the study was granted by the regional ethical review board (Dnr 2018/61-31), and it was performed in accordance with guidelines provided by the Strengthening of Reporting of Observational Studies in Epidemiology (STROBE) checklist for cohort studies (version 4, Oct/Nov 2017)¹⁸ and with the Declaration of Helsinki.¹⁹

Patients with GD who planned to undergo vaginectomy, as part of AFAB GAS, at Linköping University Hospital, Linköping, Sweden, were consecutively included in the study after their informed consent had been obtained. Patients completed a questionnaire consisting of 33 questions related to PFD either a day before, or on the day of surgery. A questionnaire consisting of the same 33 questions was sent via mail to the participants 1 year after surgery. If the participant did not respond, one single reminder was sent via mail after 4 weeks.

Takeaways

Question: Does gender-affirming vaginectomy impact symptoms of pelvic floor dysfunction (PFD)?

Findings: In the study, patients reported symptoms related to PFD preoperatively and at 1-year postoperatively. Overall, there was no statistically significant worsening of symptoms. There was however a significant worsening in the subgroup of patients who had a previous neophallus construction with a phalloplasty compared with those who had a metoidioplasty. This was most likely due to the “two-staged” closure of the vaginal cavity in the patients undergoing metoidioplasty and subsequent vaginectomy.

Meaning: Vaginectomy can be performed without serious effect on quality of life related to PFD.

A review of each participant’s medical records was conducted to gather information regarding any complications and additional surgery related to the vaginectomy up to 1 year after the primary surgery. Any deviation from a normal postoperative course causing symptoms was considered a complication.²⁰

Questionnaire

The questionnaire used in this study was given in Swedish and comprised 33 questions assessing symptoms and QoL related to PFD, as used by Persson et al.²¹ (See **table, Supplemental Digital Content 1**, which displays the change in response at 1-year postoperatively compared with preoperatively for patients having undergone vaginectomy as part of AFAB GAS. <http://links.lww.com/PRSGO/D339>.)

The questionnaire included a modified version of the Pelvic Floor Distress Inventory (PFDI-20).¹⁵ The PFDI-20 is a validated condition-specific QoL instrument commonly used in cis-women with symptoms of all forms of PFD as well as when evaluating the efficacy of a particular therapy.^{16,22} It comprises 20 questions spread over three domains [UDI-6 (Urinary Distress Inventory), POPDI-6 (Pelvic Organ Prolapse Distress Inventory), and CRADI-8 (Colorectal-Anal Distress Inventory)]. In the modified version of the PFDI-20 used for this study, one question from POPDI-6 and four questions from CRADI-8 were excluded, as suggested by Persson et al.²¹ The questions in the PFDI-20 are constructed as simple sentences and answered on a Likert-style response scale from 0 to 4: “no” (0); “yes, but it does not bother me at all” (1); “yes, and it bothers me somewhat” (2); “yes, and it bothers me moderately” (3); “yes, and it bothers me quite a bit” (4). For each of the three domains of PFDI-20, a mean is calculated and subsequently multiplied by 25, yielding the score for that domain. Only answered items are used to calculate the mean score. The score of each domain ranges from 0 (least distress) to 100 (greatest distress). Adding the scores of each of the three domains yields the total PFDI-20 score (ranging from 0 to 300).¹⁵

In addition to the modified PFDI-20, the questionnaire contained five generic questions regarding the female

genital area, five questions regarding urinary symptoms and habits, and three questions regarding impact on QoL due to leakage of urine, gas, or stool using the same Likert-style response scale as in PFDI-20. Furthermore, another five questions regarding the frequency of sanitary pad usage and leakage of urine, gas, or loose/formed stool were included. The response alternatives to these latter five questions were: “never” (0); “sometimes (yearly)” (1); “sometimes (monthly)” (2); “sometimes (weekly)” (3), or “daily” (4).

Vaginectomy and Surgical Management

All patients had previously undergone abdominal hysterectomy with bilateral salpingo-oophorectomy, either as a separate operation or on the same surgical occasion as the neophallus construction. Neophallus construction with either an MP or a pedicled flap-based phalloplasty [groin flap phalloplasty (GFP)] had been performed at least 1 year before the vaginectomy (Table 1). UL had been done in all of the patients with MP (as a single-stage procedure) and in none of the patients with GFP. Thus, the vaginectomy was done at a completely separate operation. The vaginectomy was performed with the patient under general anesthesia through the perineal approach by the same gynecologist. The patient was placed in dorsal lithotomy position and the skin incision was made in the vaginal introitus just outside the hymen between 1 and 11 o'clock. Posteriorly, the rectovaginal septum was opened via the perineum and with mutual blunt and sharp dissection, a full-thickness vaginal wall (epithelium and muscularis externa layers) resection was performed up to the level of the vaginal vault. The vaginal attachments to the levator ani muscles were divided by sharp dissection. The urinary bladder was exposed from the anterior vaginal wall from the lateral aspects. If a vaginal wall flap had previously been raised for the UL in the MP, this area in the anterior wall was left. A complete surgical resection of the vagina was carried out, provided that the mobility of the vaginal vault allowed it. Otherwise, a partial resection of the vagina was performed, leaving the upper part of the vagina. Any remaining vaginal epithelium was carefully de-epithelialized with electrocautery. The vaginal cavity was obliterated with plicating sutures in the levator ani muscles to reconstruct the pelvic floor and to close the pelvic hiatus. A 12 Fr drain was placed caudal to the urinary bladder. Finally, the perineum was reconstructed and

the introitus closed. The drain was removed after 1–3 days postoperatively.

Statistics

Continuous data are presented as mean and one SD, or median and range. Nominal data are shown as number or frequency, and percent. Statistical analyses were two-tailed and performed using a Wilcoxon signed-rank test for paired comparisons or a Mann-Whitney U test for comparisons of means. The statistical significance level was set at $P < 0.05$. Statistical analyses were executed using IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, N.Y.).

RESULTS

Twenty-three consecutive AFAB patients diagnosed with GD were included in the study and underwent vaginectomy as part of their GAS, as well as completed the preoperative questionnaire. Patient characteristics are described in Table 1.

The mean duration of surgery was 88 ± 23 minutes. Complete surgical resection of the vaginal epithelium was accomplished in three patients (13%). Perioperative full-thickness damage to the rectal wall occurred in four (17%) cases, all in patients who had previously undergone MP. All these cases were repaired by continuous serosubmucosal suture, and none required fecal diversion through a stoma. There were no postoperative complications in any of these four patients. Postoperative complications were common but minor (Table 2). In total, 10 of 23 (43%) patients had postoperative complications. None of these required surgical intervention within 30 days of primary surgery. None of the patients that had MP developed any new neourethral strictures or fistulae. Within 1 year of vaginectomy, three (13%) patients underwent an additional operation, all to treat residual vulvar mucosa in the area of the former introitus, which was excised.

Questionnaire

Twenty patients completed the 1-year follow-up (87%). The response trend to each question of the questionnaire is shown in Supplemental Table 1 (See table, Supplemental Digital Content 1, which displays the change in response at 1-year postoperatively compared with preoperatively for patients having undergone vaginectomy as part of AFAB GAS. <http://links.lww.com/PRSGO/D339>.) PFDI-20 (Fig. 1) showed a preoperative median score of 20 (0–114) compared with 35 (0–168) at 1 year

Table 1. Characteristics of AFAB Gender Dysphoric Patients Undergoing Vaginectomy

Patients (n = 23)	
Age, y [median (range)]	38 (23–56)
BMI, kg/m ² [mean (SD)]	25.0 (3.7)
Nonsmokers, n (%)	23 (100)
Nulliparous, n (%)	22 (96)
Type of neophallus construction	
Metoidioplasty n (%)	18 (78)
Groin flap phalloplasty n (%)	5 (22)
Time since neophallus construction	
Metoidioplasty, y [median (range)]	3 (1–11)
Groin flap phalloplasty, y [median (range)]	5 (1–16)

Table 2. Postoperative Complications within 1 Year after Surgery in AFAB Gender Dysphoric Patients Having Undergone Vaginectomy

Type of Complication	n (%)
Perineal pain	5 (22%)
Minor bleeding/hematoma	3 (13%)
Wound infection	1 (4%)
Minor wound dehiscence	1 (4%)

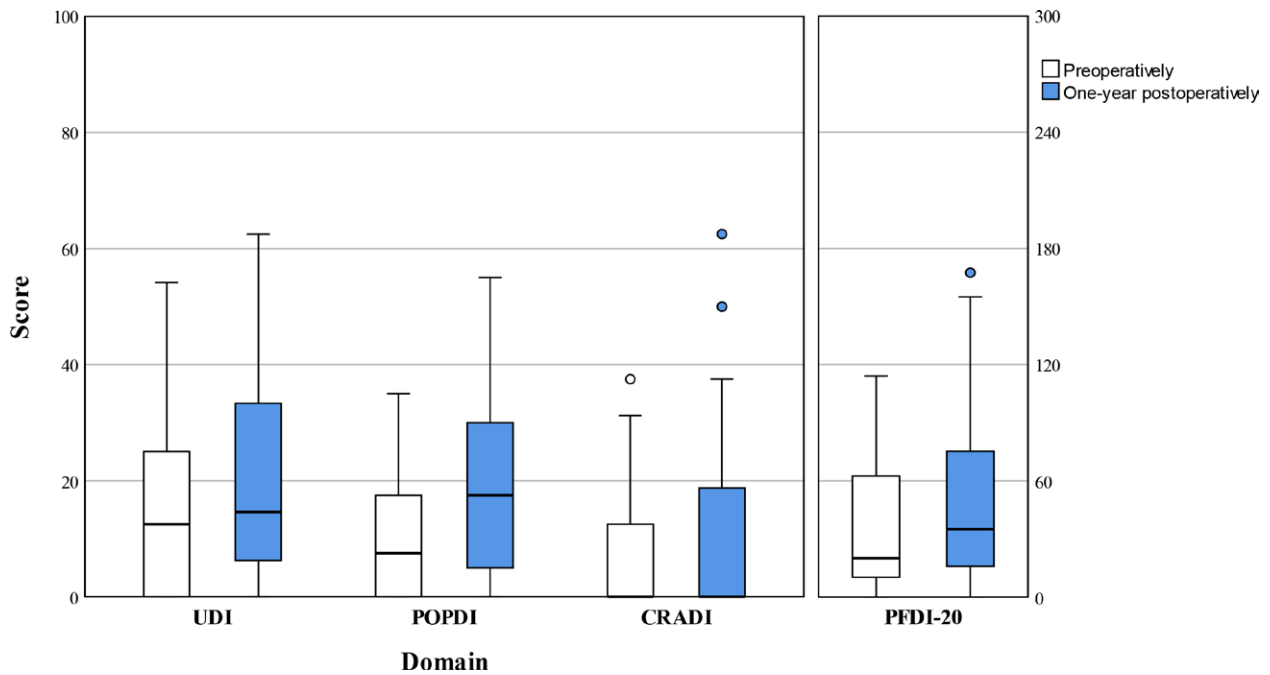


Fig. 1. PFDI-20 and its domains reported by AFAB gender dysphoric patients undergoing vaginectomy. Each domain ranges from 0 to 100, and all three are added to achieve the total score of PFDI-20 (0–300). There was no statistically significant change in PFDI-20 ($P = 0.1$).

Table 3. PFDI-20 Scores in AFAB Gender Dysphoric Patients Who Have Undergone Vaginectomy

	Preoperatively [Median (Range)]	1-Year Postoperatively [Median (Range)]	<i>P</i>
All patients (n = 20)	24 (0–114)	35 (0–168)	0.1
Patients with metoidioplasty (n = 15)	17.5 (0–114)	23 (0–137.5)	0.6
Patients with groin flap phalloplasty (n = 5)	37 (10–91)	128 (45–168)	0.04*

Wilcoxon signed-rank test was used to execute statistical analyses.
*Denotes statistical significance.

postoperatively; however, this change was not statistically significant ($P = 0.1$).

Patients who had previously undergone MP (n = 15) had a preoperative median PFDI-20 score of 17.5 (0–114) compared with those who had undergone GFP (n = 5) with a median PFDI-20 score of 37 (10–91; $P = 0.6$) and postoperative median PFDI-20 score of 23 (0–138) and 128 (45–168; $P = 0.01$), respectively. In patients with MP, there was no statistically significant change in the median PFDI-20 score preoperatively compared with 1 year postoperatively (17.5–23.0; $P = 0.6$). For the patients with GFP, the change in median PFDI-20 score (37–128) was statistically significant ($P = 0.04$; Table 3).

DISCUSSION

Vaginectomy is a procedure that may be performed as part of AFAB GAS. In our clinic, an estimated 20% of patients who undergo neophallus construction request

and proceed with vaginectomy as part of their gender-affirming treatment.²³ This frequency of vaginectomy is low when compared with many centers in other countries. Internationally, the vaginectomy is commonly performed in conjunction with other procedures such as UL, neophallus construction, or hysterectomy. Several centers recommend, or require, the vaginectomy to be performed concomitantly to the UL, due to the decreased risk of neourethral fistula and stricture formation (in both MP and flap-based phalloplasties), which has been described in several studies.^{6–8} The reason for the lower frequency of vaginectomy in our center compared with the experiences in many other centers is unclear. All patients in our center that undergo neophallus construction are informed about, and offered, the possibility of subsequent vaginectomy. Reasons could include cultural differences, differences in social security systems, or the fact that we currently only offer a staged regimen of genital GAS.

With this present study we showed that vaginectomy can be safely performed without any major postoperative complications that require surgical intervention, which is congruent with the findings of previous studies.^{9–13,24} To our knowledge, no previous study has investigated the impact of vaginectomy on symptoms of PFD in AFAB patients diagnosed with GD. Our data indicated that vaginectomy does not cause a statistically significant exacerbation of patient-reported symptoms of PFD. However, a larger and sufficiently powered study is necessary to confirm this finding. The observed increase in PFDI-20 score is nevertheless rather small and lacks clinical relevance. Even in a larger study, such a small increase will still lack clinical relevance. For cis-women undergoing pelvic organ

prolapse surgery, Karjalainen et al found the minimal important differences in means between groups to be 24 points for the PFDI-20. They also found postoperative PFDI-20 scores of 60 or less to signify an acceptable symptom state.²⁵

However, an important finding in this study is the statistically significant increase in symptoms of PFD following vaginectomy in the subgroup of patients who had previously undergone GFP (postoperative median PFDI-20 score 128, indicating a nonacceptable symptom state). We believe that one reason for the difference in patient-reported symptoms of PFD between patients having previously undergone MP and GFP may be the already previously partially closed vaginal cavity after MP. In our center, the UL of the MP is achieved by raising a pedicled flap of vaginal mucosa from the anterior part of the vaginal wall, with a width of approximately one fourth of the circumference of the vaginal cavity. The flap is then tubularized, and the intravaginal harvest site subsequently closed.²³ This incidental two-staged closure of the vaginal cavity may be one way to prevent the increase in symptoms of PFD in patients undergoing vaginectomy. This theory will impact our plans to implement the vaginectomy as part of the MP procedure in our effort to decrease the frequency of neourethral fistula and stricture formations postoperatively, and needs to be investigated further. On the other hand, in the four cases where perioperative rectal injury occurred, all patients had undergone previous MP. This may also be, in part, due to the already partially closed vaginal cavity, as the exposure of the surgical field is further limited. This limitation may be one factor that increases the risk of damage to adjacent anatomical structures. It should also be noted that none of the patients with GFP had UL, whereas all those with MP had UL. It is reasonable to believe that if the patients with GFP would have had UL, they would likely have reported more symptoms related to PFD, due to complications (ie, strictures and fistulae) commonly related to the UL in both MP and phalloplasties.^{4-8,12,23} Surprisingly, although all of the patients with MP had UL, they reported a lower degree of distress on the items in PFDI-20 related to urinary function compared with the patients with GFP (all without UL; data not shown).

In our clinic, we perform genital GAS in a staged manner, whereas in many other centers, a single-stage regimen is commonly preferred and vaginectomy is then performed on the same surgical occasion as hysterectomy, UL, and neophallus construction. Vaginectomy at the time of hysterectomy, especially with robotic assistance, facilitates the complete surgical resection of the upper part of the vagina, which was only possible in a few patients in this study. However, our staged regimen did give the opportunity to study the isolated impact that vaginectomy may have on symptoms associated with PFD.

This study reflects the experience of a single gynecological surgeon. The sample size in this study is relatively small, and the results, especially of the subgroup analysis, may therefore not be globally generalizable. Furthermore, there is a risk of selection bias, as only approximately 20% of patients in our center who had undergone neophallus

construction proceeded with vaginectomy. However, the findings indicate that vaginectomy may be safely performed without severe or life-threatening complications and without severe impact on symptoms of PFD. Another limitation is that the questionnaire used in the study has not been validated in patients diagnosed with GD.

Overall, vaginectomy did not seem to negatively impact QoL due to symptoms of PFD, except for the subgroup that had previously undergone GFP. The results of the study raise the question of whether patients with GFP should be operated on with staged vaginectomy. However, this requires further well-designed studies taking a comprehensive view on objective and subjective outcomes.

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DISCLOSURES

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