ORIGINAL ARTICLE

The Sexual, Psychological, and Body Image Health of Women Undergoing Elective Vulvovaginal Plastic/ Cosmetic Procedures: A Pilot Study

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Vulvovaginal aesthetic (VVA) surgery has become increasingly popular, and there is anecdotal support for its enhancing effects on sexual functioning and self-concept. We conducted a prospective pilot study to evaluate the impact of VVA surgery on sexual response. A prospective cohort of women electing VVA cosmetic surgery completed questionnaires before VVA surgery (n = 33), after VVA surgery (n = 18), and again 6 to 9 months later (n = 12) using the Female Sexual Function Index, the Brief Symptom Inventory, and the Yale-Brown Obsessive-Compulsive Scale for Body Dysmorphic Disorder. No significant effect of VVA surgery was noted on Desire, Lubrication, Orgasm, Pain, or Total Score at either time point, but scores on Arousal and Satisfaction increased immediately after surgery, then fell back to baseline levels at follow-up. No significant effect of VVA surgery was seen on psychological functioning at either time point. According to established cut-off scores for body dysmorphic disorder (BDD), 61.1% of participants met criteria for BDD at baseline; this proportion significantly dropped to 11.1% after surgery, and to 8.3% at follow-up. Contrary to anecdotal claims, women in the present sample did not have symptoms of sexual dysfunction that may have motivated them to seek VVA surgery, nor was there any significant effect of surgery on sexual response. It is important to note that a high proportion of women seeking VVA met criteria for BDD; this has implications for surgeons and consenting patients for these cosmetic genital procedures.

Vulvovaginal aesthetic (VVA) surgery was developed to modify the appearance and function of the vulva, including the labia majora, labia minora, vaginal opening, inner vagina, and clitoral hood. Although surgical procedures on female genitalia for medical necessity, such as excising cancerous tumors, have been accepted and are well established in empirical literature, modifying the physical appearance of the vulva for purely aesthetic and sexual function purposes is a relatively new advancement emerging in the wake of other popular cosmetic surgeries, such as breast augmentation and rhinoplasty. Increased psychological well-being is advertised as a prominent aftereffect of VVA procedures by physicians,[1] but few empirical studies have compared the psychological well-being of women before and after surgery,[2–9] and we are aware of no studies that have included a prospective design. Recently, discussions of VVA surgery have seeped into modern dialogue, reflected in the growing number of articles published in popular magazines[10] and featured on television.[11–13] Rising media attention reflects the increasing number of procedures conducted, although no complementary rise in empirical data has occurred.[14] The relative paucity of research compared with the increasing popularity of VVA surgery provides the impetus for the current pilot study.

The ancient Egyptians are the first recorded culture to have performed plastic procedures on the vulva, and accounts of forced female circumcision as a method of reducing sexual pleasure have been documented throughout history, especially in the Middle East.[15] Early reasons for modification originated in cultural beliefs and religion, often with the intention of decreasing sexual pleasure.[16] In contrast to these motives related to reducing sexuality, in the 1980s, women's own personal displeasure with the aesthetic appearance and function of the vulva prompted the development of current VVA surgeries in North America.[17,18]

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Several types of VVA surgery may be performed, each serving a different aesthetic and/or functional purpose.[14] Labiaplasty is the surgical alteration of the labia minora or majora, which can help decrease discomfort in women with labia minora hypertrophy and can change the appearance of the labia dramatically.[14] Reduction of the clitoral hood involves size reduction of a perceived fleshy and hypertrophied hood/prepuce. Occasionally, in cases of hood phimosis, the hood may be altered to provide for emersion of a previously trapped clitoral glans. Many advocates of these procedures advertise increased sexual pleasure as an important by-product of the surgery; however, few data are currently available to support this claim.[1]

Although modern VVA surgeries were developed in the 1980s,[17,18] most of the limited empirical research has been collected over the past 10 years. In this literature, physical recovery following surgery has been the most commonly considered endpoint to establish efficacy of surgery. Measures of satisfaction, although recorded, were typically insufficient to adequately assess the psychological well-being of the patient. For example, Rouzier and colleagues[2] (2000) focused on the functional and physical appearance of the vulva after the surgery, and questions regarding satisfaction were limited by both the range of topics addressed and the dichotomous yes/no response options on items. Many other studies[1–9] have similarly been limited to functional and physical results of VVA surgery. A notable exception is a study conducted by Bramwell et al,[19] which utilized semistructured interviews to gain insight about the psychological well-being of participants; results revealed important individual variations in motivation, access, and response to surgery that were not detected in earlier research. In particular, most women reported feeling as though their genitals were "abnormal," and the goal of achieving a "normal" genital appearance was a prime motivator for surgery.

It is important to note that investigations regarding "normalcy" in female genitalia revealed a wide range of naturally occurring variation.[20] Among sexually active women, discomfort with the appearance of their genitals translated into anxiety and inhibitions during sexual activity for fear of a partner's negative evaluation, although a partner's negative reaction is rarely noted by patients as a reason for surgery.[1] Thus, the primary purpose of VVA surgery is to reduce this negative self-focus for women, to acquire a "normal" genital appearance (per her perception of "normal"), and to alleviate discomfort (eg, experienced through chafing).

The current study aimed to compare the psychological well-being of a small sample of women seeking VVA surgery and to further explore the construct of perceived abnormality as observed in earlier research.[19] We explored effects on sexual function as a primary endpoint, given that hopes of improved sexual functioning (ie, sexual desire, arousal, and/or orgasm) have been speculated to be a motivating factor among women seeking VVA surgery. We also measured psychological symptoms to track baseline levels of psychopathology and any improvements that occurred as the result of VVA surgery. Finally, we were interested in symptoms of body dysmorphic disorder (BDD), given the speculation that women seeking VVA surgery may be motivated by significant anxiety arising from a presumed physical defect in their vulva/vagina. This pilot study is novel in that it employed a prospective design whereby women were assessed before VVA surgery, after VVA surgery, and 6–9 months following VVA surgery.

Method

Participants

From 2009–2010, we recruited 33 women who were seeking VVA surgery at the offices of 3 VVA surgeons located in Chicago, Ill, Atlanta, Ga, and Davis, Calif. All women were seeking VVA surgery for cosmetic reasons and/or to alleviate discomfort secondary to chafing, entrapment, hygienic difficulty, and so forth. Table 1 displays the types of VVA surgery performed and the number of women that underwent each. Patients were recruited by individual sites, and 96% of those who were approached by the surgeon agreed to participate. Those declining to participate cited lack of time as the primary reason. The average age of the total VVA surgery sample at baseline was 35.40 years (SD 11.73 years). Forty-four percent of the women reported being single, 28% were married, and the final 28% were partnered, although unmarried. No specific inclusion criteria were required other than that women had to have provided consent to undergo a VVA procedure and had to be willing to complete the questionnaires.

Procedure

Women were informed about the study by 1 of 3 recruiting VVA surgeons and were told that the purpose of the study was to explore the impact, if any, of VVA surgery on select aspects of mood and sexual health. They were given the questionnaire package (described later) to complete in the waiting room

Table 1. Surgery Types With Descriptions

Type of Surgery	Description	Number Performed
Labiaplasty	Removal of portions of the labia minora and/or labia majora. Modified V-wedge, leading edge, and sculpted linear resection techniques were used in this study.	14
Clitoral hood reduction	Excision of excess prepuce surrounding the clitoris	6
Varinoplasty	Reduction of excess mucosa from the vaginal fornices	2
Perineoplasty	Removal of excess tissue, reconstruction of the vulvar vestibule, vaginal introitus, and distal vagina, and adjustment of surrounding muscles and tissue	4

immediately before their surgery visit, 1 month after surgery during their postoperative follow-up, and again 6–9 months later by mail or when they visited the VVA surgeon for the final time. At the time of surgery, women were advised that they could resume sexual activity by 4 weeks postoperatively. They were given a unique study ID, which was written on all questionnaire material to preserve confidentiality. The completed questionnaire package was then given to the clinic's receptionist, sealed, and immediately mailed to the research office of the last author, who neither was involved in the VVA surgeries nor interacted directly with participants. Women were recruited consecutively in the offices of the surgeon investigators, all of whom have had extensive experience conducting VVA surgeries for cosmetic and functional reasons.

Upon receipt, all data were entered into a research database maintained in the laboratory of the last author. Procedures were approved by the University of British Columbia's Behavioral Research Ethics Board, and all participants provided written consent to their surgeon.

Measures

Measures of sexual response, psychological functioning, and body dysmorphic disorder symptoms were administered at each of the 3 assessment points. Sexual response was assessed with the Female Sexual Function Index (FSFI),[21] which is a validated 19-item measure providing separate indices of Desire, Arousal, Lubrication, Orgasm, Pain, and Satisfaction, as well as a Total Sexual Function Score. Higher scores on each subscale indicate better levels of sexual functioning. Test-retest reliability for the FSFI is high (ranging from $r = 0.79$–0.86 for the different domains), and internal consistency is high (Cronbach's alpha values were 0.82 and higher). The cut-off score of 26.55 has been used to establish sexual difficulty in respondents.

Psychological functioning was assessed with the Brief Symptom Inventory (BSI).[22] The BSI is a self-report questionnaire that measures psychological symptoms in terms of 9 major symptom dimensions and 3 global indices of distress. Respondents rate the level of distress or bother that they have experienced from each of 53 items over the past 2 weeks. The items are rated on a 5-point Likert scale, ranging from 0 (not at all) to 4 (extremely). Internal consistency reliability for the 9 dimensions ranges from 0.71 on Psychoticism to 0.85 on Depression. Test-retest reliability for the 9 symptoms ranges from 0.68 for Somatization to 0.91 for Phobic Anxiety and 0.90 for the Global Severity Index.

Symptoms of BDD were assessed with a modified version of the Yale-Brown Obsessive-Compulsive Scale (YBOCS-BDD),[23] a 12-item instrument with several domains: obsessional preoccupation (items 1–5), behaviors related to the presumed physical defect (items 6–10), insight (1 item), and avoidance (1 item), along with a total score, which is a sum of all items. We did not examine the measure of insight in this study because it is meant to be clinician, not patient, determined. Interrater reliability is excellent ($r = 0.85$–1.00), 1-week test-retest reliability is very good ($r = 0.88$), Cronbach's alpha is 0.80, and the scale is significantly associated with a global measure of illness severity ($r = 0.55$) but is only weakly associated with a measure of general psychopathology ($r = 0.19$).[23] Items were coded on a 5-point Likert scale, and a YBOCS-BDD total score was computed for each participant at each time point. In addition, we calculated the proportion of women meeting probable BDD criteria by adding the scores of the first 3 items and using 4 as a cut-off for mild BDD and 12 as a cut-off for extremely severe BDD, according to the criteria set out by Phillips et al.[24]

Data Analysis

Data were analyzed with the Statistical Package for the Social Sciences, version 16.0 (SPSS Inc, Chicago, Ill). A paired samples *t* test was used to

Table 2. BDD-YBOCS Scores*†

Total Score on First 3 BDD-YBOCS Items	BDD Severity
4 or 5	Mild BDD
6	Mild to moderate BDD
7	Moderate BDD
8	Moderate to severe BDD
9	Severe BDD
10	Severe to extremely severe BDD
11 or 12	Extremely severe BDD

*BDD indicates body dysmorphic disorder; YBOCS, Yale-Brown Obsessive-Compulsive Scale.
†From Phillips et al[24(p33)].

compare responses from before surgery to immediately after surgery. We then conducted a repeated measures analysis of variance (ANOVA) to examine changes in scores across all 3 time points. In cases of violation of sphericity, the Greenhouse-Geisser test was used. When a significant repeated measures ANOVA was found, pairwise contrasts were conducted to determine which time points significantly differed from oneanother. Data were analyzed for 18 women who provided data for both of the first 2 time points, and for 12 women who provided data at all 3 time points. Given the large number of analyses performed, we used a Bonferroni correction such that only *P* values less than .025 were considered statistically significant.

Results

Baseline Levels of Sexual and Psychological Functioning

No significant differences were noted between the 18 women who provided data before and after surgery and the 15 women who provided information before surgery only on any of the FSFI, BSI, or YBOCS-BDD scores (all $P > .025$) (data not shown). FSFI total scores were in a range comparable with that of a group of sexually healthy women.[25] Mean scores on the BSI were also in the range of a nonclinical control group. On the YBOCS-BDD, the criteria indicated by Phillips,[24] in which the first 3 items correspond to *Diagnostic and Statistical Manual of Mental Disorders,* 4th edition, Text Revision (DSM-IV-TR) criteria,[26] can be used to infer a diagnosis of BDD; 11 of the 18 (61.1%) VVA participants met the criteria for probable BDD. A summary of YBOCS-BDD severity levels corresponding to a BDD diagnosis is listed in Table 2.

Table 3. Scores on the FSFI for Women Receiving Vulvovaginal Aesthetic Surgery ($n = 18$)*†

	Before Surgery		After Surgery		
Measure	Mean	SD	Mean	SD	*P*
FSFI Desire	4.23	1.12	4.20	1.15	.90
FSFI Arousal	4.18	1.08	4.93	0.79	.05
FSFI Lubrication	5.13	1.09	5.23	0.96	.49
FSFI Orgasm	4.47	0.92	5.13	0.98	.06
FSFI Satisfaction	4.00	1.67	5.05	0.74	.02
FSFI Pain	4.03	2.55	4.60	1.88	.38
FSFI Total Score	26.0	4.80	29.5	3.23	.03

*FSFI indicates Female Sexual Function Index.
†Scale range: FSFI Arousal, Lubrication, Orgasm, Satisfaction, and Pain scores range from 0–5, with higher scores denoting better sexual function. FSFI Desire scale ranges from 1–5, with higher scores denoting more desire. FSFI Total Score scale ranges from 2–36, with higher scores denoting better overall sexual function; a cut-off score of 26.55 has been used to denote sexual difficulty.

Effects of VVA Surgery on Sexual Functioning

No significant effect of surgery on FSFI Desire, Lubrication, Orgasm, Pain, or Total Score was noted immediately after surgery or at follow-up ($P > .025$). The effect of surgery on FSFI Arousal neared significance, such that scores showed a trend toward improvement ($t[11] = –2.20$; $P = .05$), but no significant increase in arousal was evident when long-term data were considered ($P > .025$). A similar pattern was observed for FSFI Satisfaction, such that scores significantly increased immediately after surgery ($t[10] = –2.87$; $P = .017$), although effects on satisfaction were not significant when follow-up data were considered ($P > .025$) (Table 3).

Effects of VVA Surgery on Psychological Functioning

No significant effects of VVA surgery were noted immediately after surgery or at follow-up on any of the BSI subscales (all $P > .025$) (Table 4).

Effects of VVA Surgery on Body Dysmorphic Disorder Symptoms

On the YBOCS-BDD Preoccupation domain, scores significantly dropped immediately after surgery ($t[17] = 6.37$; $P < .001$) and at follow-up ($F[2,22] = 28.40$; $P < .001$) (Table 5). On the BDD-Behaviors domain, a significant reduction in scores was seen immediately

Table 4. Scores on the BSI for Women Receiving Vulvovaginal Aesthetic Surgery (n = 18)*†

	Before Surgery		After Surgery		
Measure	Mean	SD	Mean	SD	*P*
BSI – Hostility	0.49	0.58	0.43	0.64	.77
BSI – Anxiety	0.44	0.52	0.33	0.41	.31
BSI – Somatization	0.33	0.37	0.36	0.44	.81
BSI – Obsession/ Compulsion	0.84	0.83	0.69	0.72	.33
BSI – Interpersonal Sensitivity	0.61	0.55	0.47	0.51	.34
BSI – Depression	0.62	0.67	0.35	0.49	.17
BSI – Phobic Anxiety	0.11	0.22	0.08	0.24	.62
BSI – Paranoid Ideation	0.43	0.48	0.31	0.53	.23
BSI – Psychoticism	0.32	0.40	0.28	0.35	.72
BSI – Global Severity Index	0.48	0.36	0.37	0.39	.25

*BSI indicates Brief Symptom Inventory.
†Scale range: All BSI subscales range from 0–4, with higher scores denoting more psychological symptoms.

after surgery (t[17] = 4.89; $P < .001$) and a significant effect was noted at follow-up (F[2,20] = 7.09; P = .005). Significantly less YBOCS-BDD Avoidance was observed immediately after surgery (t[17] = 3.69; P = .002), as was a significant effect at follow-up (F[2,22] = 8.51; P = .002). Overall, BDD symptoms were significantly reduced immediately after surgery, as indicated on the YBOCS-BDD Total Score (t[17] = 6.75; $P < .001$); this effect was also present at follow-up (F[2,20] = 22.38; $P < .001$).

According to the criteria set forth by Phillips,[24] 2 of the women in the VVA group (11.1%) met criteria for probable BDD after surgery. At 6 to 9 months' follow-up, 1 of the women in the VVA group (8.3%) continued to meet criteria for BDD.

Discussion

The primary aim of this study was to conduct the first prospective pilot study on the psychological and sexual response outcomes of women before and after VVA surgery. Rates of psychological adjustment and sexual functioning were within the nonclinical range before surgery.[21,25] On most domains of sexual functioning, no significant short-term or long-term benefits and no deterioration occurred with VVA. Exceptions included the FSFI Arousal and Satisfaction domains, on which significant improvement was seen immediately after surgery, but this effect became nonsignificant at follow-up. Although this is a small, select sample, these findings challenge anecdotal claims that VVA surgery improves or worsens sexual functioning.

Table 5. Scores on the Yale-Brown Obsessive-Compulsive Scale for BDD for Women Receiving Vulvovaginal Aesthetic Surgery (n = 18)*

	Before Surgery		After Surgery		
Measure	Mean	SD	Mean	SD	*P*
Preoccupation	7.33	3.90	2.83	2.71	.001
Behaviors	6.17	3.96	2.00	2.11	.001
Avoidance	1.11	1.08	0.22	0.55	.002
BDD Total Score	16.67	8.79	5.72	4.76	.001

*BDD indicates body dysmorphic disorder.

Our finding that VVA surgery had no significant impact on most domains of sexual functioning stands in contrast to previous claims of improvement following surgery in the scientific literature, as well as suggestions of a negative influence on sexual functioning as put forth by critics of VVA surgery.[4,6,27] The fact that sexual satisfaction increased significantly immediately after surgery despite no notable change in "function" (ie, desire, orgasm) may relate to the high financial costs and motivation required to undergo VVA surgery, which may have impacted self-reported satisfaction through cognitive dissonance.[28] Cognitive dissonance, as first described by Festinger[29] in 1957, states that people experience psychological discomfort when they behave in ways that are not in line with their beliefs. Therefore, with respect to VVA surgery, patient self-reporting might reflect a bias toward improved sexual functioning that reflects their presurgery belief that VVA surgery will be beneficial. It is also possible, however, that the improved sexual satisfaction was related to improvements in confidence or generally improved self-image,[30] such that if a woman perceives that she looks better, she may have more self-confidence and therefore a more satisfying sexual experience that may be unrelated to obvious changes in sexual desire or orgasm. In a retrospective study of women undergoing nongenital cosmetic surgical procedures, significant improvements in sexual satisfaction and body image were reported.[31] That the

satisfaction domain of sexual functioning was not significantly improved at follow-up suggests that any immediate improvements following surgery are not long-lasting. Whether "lost gains" at follow-up reflect a trend toward deterioration in sexual function if women would have been evaluated again later, or whether they reflect a "return to baseline," is unknown and calls for further research to explore the long-term effects of VVA surgery on sexual response and satisfaction.

General psychiatric functioning, as measured by BSI scores, was unaffected by VVA surgery. That VVA surgery did not improve or worsen psychiatric functioning stands in contrast to previous anecdotal claims by proponents of VVA surgery suggesting that VVA surgery may lead to benefits in psychiatric functioning.[27]

Despite the substantial discourse relating motivation for VVA surgery to dimensions of sexual and general psychiatric functioning, past research has not explored the specific construct of body dysmorphic concerns and the extent to which these specifically may motivate women to seek VVA surgery. Although we did not assess motivation directly, our assumption was that high pre-surgery levels of BDD symptoms followed by a significant reduction in symptoms with surgery suggest that dissatisfaction with, or a presumed defect in, one's genital appearance may have motivated the desire for VVA surgery. Following surgery, BDD-related preoccupation and behaviors, avoidance behavior, and the BDD total score were significantly reduced. In other words, women seeking VVA surgery had significant body dysmorphic concerns that decreased following surgery, and even further at follow-up. Before undergoing surgery, 11 women (61.1%) satisfied criteria for mild to moderate BDD, as evidenced by the degree to which they were preoccupied with their body and avoided looking at the body part they perceived to be defective, as well as by their attempts to improve their body deficit(s). The number of women meeting BDD criteria after surgery was 2, and at follow-up was 1.

To what extent are findings related to BDD specific to women seeking cosmetic genital procedures versus other elective cosmetic procedures in general? Evidence of BDD symptoms in patients undergoing cosmetic procedures is strong, and rates range between 6% and 53% depending on the method used to measure BDD.[32] Previous retrospective studies report overall poor outcomes for individuals with BDD following surgery, including discontent with the procedure, maintenance of body dysmorphic symptoms, and, if content with the present surgery, preoccupation with a different perceived bodily defect.[32,33] In the present study, the considerable abatement of body dysmorphic symptoms following VVA surgery possibly reflects the high number of women qualifying for mild BDD at baseline in contrast to more severe cases. However, the rates of BDD among women seeking VVA surgery may not be all that different from those of women seeking cosmetic surgical procedures in general. These findings call for careful counseling and screening of women who seek VVA procedures.

Although we did not measure discontent with surgery or preoccupation with other presumed defects in the body, the very high rate of BDD at baseline is notable. BDD is a condition classified in DSM-IV-TR as a "somatoform disorder."[26] It has also been recognized that BDD may be underrecognized in settings in which cosmetic procedures are performed. Because general psychiatric functioning in our sample was in the normal range, it is possible that the significant psychiatric morbidity that often goes along with a BDD diagnosis was less present in our sample. The implication of this finding is that it would be prudent for VVA surgeons to carefully assess, before consenting to patients undergoing a VVA procedure, the extent to which patients' dissatisfaction with their genital appearance falls within the range of normal bodily concerns versus being more in line with BDD. Because BDD has a fairly continuous course over the life-span,[33] it is unlikely that bodily dissatisfaction will abate completely with VVA surgery. The finding of significant abatement of BDD symptoms 6 to 9 months after surgery suggests that the potential benefit that VVA surgery can have on women with mild BDD relates to "repairing" their presumed defect.

Limitations of this study must be considered when findings are interpreted. First, this is a small sample of women, and the lack of significant effect of VVA surgery on most measures of sexual functioning may relate to an insufficiently powered study. Given the (small) magnitude of our effect sizes (data not reported), however, it is unlikely that a larger sample size would have led to significant group differences in response to VVA surgery. Second, it must be kept in mind that only women who were willing to complete the self-report questionnaires participated in this study. The study also suffered from a moderate attrition rate, with only 18 of the 33 women providing data before and after surgery. A major strength of our study, however,

was the prospective nature of the data collection procedure and the presentation of pilot data from which larger-scale prospective studies might emerge. Previous studies only retrospectively assessed self-report domains of function; however, because retrospective assessment is particularly subject to cognitive dissonance, it is not an ideal method to be used in VVA surgery outcome research.

Overall, our findings do not corroborate previous assertions that VVA surgery has a significant positive impact, nor a significant negative impact, on general psychiatric or sexual functioning. Moreover, the pre-surgery characteristics of our small sample, which show normal levels of sexual response, suggest that it is not complaints of impaired sexual functioning that are motivating women to seek surgery. Because of elevated pre-surgery levels of BDD symptoms and subsequent significant reduction following VVA surgery, our data suggest that at least some of the women seeking VVA surgery likely meet diagnostic criteria for distressing BDD, and these symptoms improve following VVA surgery. As a result of the small and highly select nature of our sample, these findings should be replicated in a larger prospective trial before definitive conclusions can be drawn about the characteristics of women seeking VVA surgery and the impact of such surgery on sexuality, psychiatric function, and body-related distress. In the interim, surgeons who perform these procedures must heed the recommendation to carefully screen patients before providing consent to address BDD-related symptoms.

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