Evaluation of Body Image and Sexual Satisfaction in Women Undergoing Female Genital Plastic/Cosmetic Surgery

Aesthetic Surgery Journal
2016, 1–10

DOI: 10.1093/asj/sjw061
www.aestheticsurgeryjournal.com
OXFORD UNIVERSITY PRESS

Michael P. Goodman, MD; Otto J. Placik, MD; David L. Matlock, MD; Alex F. Simopoulos, MD; Teresa A. Dalton, JD, PhD; David Veale, MD, PhD; and Susan Hardwick-Smith, MD

Abstract

Background: Little prospective data exists regarding the procedures constituting female genital plastic/cosmetic surgery (FGPS).

Objectives: To evaluate whether the procedures of labiaplasty and vaginoperineoplasty improve genital self image, and evaluate effects on sexual satisfaction.

Methods: Prospective cohort case-controlled study of 120 subjects evaluated at baseline, 6, 12, and 24 months postoperative, paired with a demographically similar control group. Interventions include labiaplasty, clitoral hood reduction, and/or aesthetic vaginal tightening, defined as perineoplasty + "vaginoplasty" (aka "vaginal rejuvenation."). Outcome Measures include Body Image, Genital Self-Image, Sexual Satisfaction, and Body Esteem.

Results: As a group, study patients tested at baseline showing body dissatisfaction, negative genital self-image, and poorer indices of sexual satisfaction. Preoperative body image of study patients were in a range considered to be mild to moderately dysmorphic, but matched controls at one and two years; genital self-image scores at entry were considerably lower than controls, but by 2-year follow-up had surpassed control value at entry. Similarly, sexual satisfaction values, significantly lower at entry, equaled at one, and surpassed control values, at 2 years. Postoperatively, at all points in time, these differences in body image and genital self-image disappeared, and sexual satisfaction markedly improved. Overall body esteem did not differ between study and control groups, with the exception of the genital esteem quotient, which improved after surgery.

Conclusions: Women requesting and completing FGPS, when tested by validated instruments, at entry report sexual dissatisfaction and negative genital self-image. When tested at several points in time after surgery up to two years, these findings were no longer present. When performed by an experienced surgeon, FGPS appears to provide sexual and genital self-image improvement.

Level of Evidence: 2

Accepted for publication March 9, 2016.

Physicians who work with women interested in altering appearance or function of their genitalia soon come to understand how much extremes of size, symmetry, "laxity," or visually self-perceived unattractiveness affects them. Feelings of emotional and psychosexual distress, in addition to functional distress, significantly impact these

Dr Goodman is a cosmetic gynecologist in private practice in Davis, CA, Dr Placik is an Assistant Clinical Professor, Department of Plastic Surgery, Feinberg School of Medicine, Northwestern University, Chicago, IL, Dr Matlock is a cosmetic gynecologist in private practice in Los Angeles, CA, Dr Simopoulos is a cosmetic gynecologist in private practice in Los Angeles, CA, Dr Dalton is Director, Master of Advanced Study Program, Department of Criminology, Law and Society, University of California, Irvine, CA, Dr Veale is a Consultant Psychiatrist in Cognitive Behavioral Therapy at the South London and Maudsley NHS Trust and The Priory Hospital North London, London, United Kingdom, Dr Hardwick-Smith is a cosmetic gynecologist in private practice in Houston, TX.

Corresponding Author:
Dr Michael P. Goodman, Caring For Women Wellness Center, 635 Anderson Road, Suite 12B, Davis, CA 95616, USA.
E-mail: michaelgoodman250@gmail.com

women.[1] Protrusion of labia minora well beyond the confines of the labia majora, as well as marked redundancy of labia majora, have cosmetic, self-esteem, hygienic, sexual, and functional ramifications. Those ramifications are commonly cited by women requesting surgery. Physical discomfort and cosmetic concerns are frequently combined, and many women relate feelings of vaginal and perineal laxity detrimental to coital enjoyment and orgasmic facility.[1-16]

Female genital plastic/cosmetic surgery (FGPS) has been developed in response to women's desires to modify the appearance and function of their vulvas and vaginas. A growing literature is accumulating regarding the rationale for choosing FGPS. Although much of this has been retrospective, recent studies have been prospective.[17-21] A small pilot study published in 2011[17] found significant short term (6-month) resolution of apparent body dysmorphic complaints noted at study entry. Veale et al noted similar findings at 3 months postoperative, using a different testing instrument.[20] The relative paucity of research paired with the increasing demand for FGPS provides the impetus for the current study.

Different types of surgery serve different aesthetic or functional purposes.[11] Labiaplasty surgically alters the labia minora or majora and can significantly change labial appearance.[11] Reduction of the clitoral hood involves size reduction of a perceived hypertrophied or "fleshy" hood. In cases of phimosis, the hood may be separated to provide for emergence of a previously buried glans clitoris. The so-called "vaginal tightening" procedures are essentially modifications of posterior colporrhaphy/perineorrophy/perineoplasty procedures. These use a layered closure to re-approximate the levator musculature, strengthen the pelvic floor, minimize width of the genital hiatus, buttress the musculature with rectovaginal fascia, elevate the perineal body to reestablish the downward tilt of the vagina, and repair the introitus, vestibule, and perineum in an aesthetic manner.

Modern FGPS techniques have evolved rapidly. Most of the empirical and retrospective research has been collected over the last 15 to 20 years, focused on a vaguely defined "satisfaction with results" or "sexual enhancement" as the endpoint. Measures of satisfaction, although recorded, were typically insufficient to assess psychological well-being of the patient. In 2000, Rouzier et al focused on the functional and physical appearance of the vulva after surgery. Questions regarding satisfaction were limited both by the range of topics addressed and by yes/no response options.[3] Goodman et al's well-powered but retrospective study of 341 procedures in 258 patients looked at both "patient satisfaction" and "enhancement of sexual function." They found positive outcomes in the great majority: 97% overall satisfaction and sexuality enhancement of 87% for vaginal tightening operations and 67% for labiaplasty.[2] Other studies have similarly been limited to functional and physical results of FGPS.[3-10]

Bramwell et al[16] utilized semi-structured interviews to gain insight about psychological well-being of participants; their results revealed important individual variations in motivation, access, and response to surgery that were not detected in earlier research. In particular, most women initially reported feeling their genitals were "abnormal" and expressed the goal of achieving a "normal" (to them) genital appearance as the main reason for surgery.[1] It is important to note that investigations regarding "normalcy" in female genitalia reveal a wide range of variation.[17] Among sexually active women, discomfort with the appearance of their genitals translates into anxiety and inhibitions during sexual activity. A partner's negative reaction was rarely noted by patients as rationale for surgery.[2]

The current study seeks to explore the relationship of body image, genital self-image, and sexual satisfaction in women seeking genital surgery. It aims to compare body-image perception in women seeking and receiving FGPS with the perception of a control group. Effects of surgery on body image, sexual self-image, and sexual satisfaction were explored, as women seeking FGPS express the desire for improvement in these areas.

METHODS

Subjects

We recruited a consecutive sample of 120 women aged 18 to 63 over a period of 18 months (September 2010 to March 2012) who sought and received FGPS at the offices of five surgeons in Davis, CA, Los Angeles, CA, Chicago, IL, and Houston, TX (two of the surgeons are based in Los Angeles, CA). All surgeons have extensive experience conducting FGPS surgeries for cosmetic and functional purposes; each had performed > 500 FGPS procedures at time of study baseline. Women scheduling FGPS were informed about the study by surgeon or staff, and were told its purpose was to explore the impact, if any, of the surgery on body image and sexual health. All women were seeking care for the various reasons already mentioned. The great majority of women approached (120/124; 96.7%) agreed to participate. IRB approval (Behavioral Research Ethics Board, University of British Colombia, Vancouver, BC, Canada) was granted and all participants were presented with and signed appropriate release forms. The control group was recruited by selecting that patient (new or return) registering next after a recruited study patient, provided that they were within 5 years in age of the preceding study-enrolled patient. These were a convenience cohort from the investigators' gynecology and plastic surgery practices. We chose this method of recruitment in an effort to obtain a loosely matching cohort which would mimic, in age and demographics (since they were from the same practices and age range as recruited study subjects), an

"average community cohort." Utilizing this protocol. A total of 50 women agreed to participate as "controls." While participation was excellent among FGPS patients, a much higher percentage of potential control patients declined to participate, and it was not possible to recruit a control group of equal size to the study group. Demographics of both groups are summarized in Table 1.

Subjects were given the questionnaire package to complete in the waiting room prior to their surgery (controls after their office encounter) and later at 6 to 9 months (Study and Control), 12 to 15 months (Study), and 23 to 25 months after surgery (Study). Follow-up was administered via online or hard copy questionnaires. At the time of surgery, women were told they could resume coital sexual activities 4 to 8 weeks postoperatively, as determined by their surgeon. To preserve confidentiality, they were given a unique study ID recorded on all instruments. The completed package was then given to the office's designee, sealed, and mailed to the research office. When the package was received at the research office, all data were entered into a research database.

All subjects completed these instruments: (1) A demographic profile including age, ethnicity, parity, education, relationship status, and satisfaction with present sexual relationship; (2) The Yale-Brown Obsessive-Compulsive Scale, modified for Body Dysmorphic Disorder (BDD-YBOCS)[22]; and (3) The Female Genital Self-Image Scale (FGSIS).[23] Participants were additionally invited to

Table 1. Demographics

	FGPS group (N = 120) N (%)	Control group (N = 50) N (%)	*P* value
Age (years)			.768
Mean (±SD)	32.74 ± 10.14	33.20 ± 9.58	
Range	18-63	18-58	
Ethnicity			Significant group difference (.03): More Caucasian women in study group (80%) than control group (66%)
Caucasian	96 (80)	33 (60)	
Hispanic	12 (10)	5 (10)	
Asian	4 (3.3)	9 (18)	
African-American	3 (2.5)	1 (2)	
"Other/mixed race"	6 (4.2)	2 (4)	
Relationship status			Significantly fewer women in the WA group (61%) were in a relationship compared to women in Control group (88%) (*P* = .004)
Single/dev/sep/widow	46 (38.3)	6 (12)	
"Dating"	38 (31.7)	17 (34)	
Married/cohabitating	36 (30)	27 (54)	
# children	0.83 ± 1.27	0.96 ± 1.21	.527
Highest education			.359
High school	20 (16.7)	8 (16)	
College graduate or some college	75 (62.5)	35 (70)	
Post-graduate degree	25 (20.8)	7 (14)	
Mean (±SD) length of current relationship (years)	5.04 ± 7.32	7.97 ± 8.90	.029
Mean (±SD) length of longest relationship (years)	7.46 ± 6.69	9.95 ± 8.02	.04
"Are you satisfied with your sexual relationship?"	N = 118	N = 49	<.0001
"Yes"	57 (48.3)	41 (83.7)	
"No"	32 (27.1)	3 (6.1)	
N/A	29 (24.6)	5 (10.2)	

complete two additional validated instruments: The Index of Sexual Satisfaction (ISS)[24] and the Body Esteem Scale (BES).[25] Blank copies of the BDD-YBOS, FGSIS, ISS, and BES are available as Supplementary Material at www.aestheticsurgeryjournal.com.

Main Outcome Measures

Measures of body dysmorphic symptoms, genital self-image, sexual satisfaction, and body esteem were completed at each of the assessment points.

Body Image

Body image was assessed with a modified self-report version of the BDD-YBOC,[22] a 12-item semi-structured instrument designed to rate severity of body dissatisfaction via reporting of dysmorphic symptoms. The BDD-YBOCS was found to have good test-retest reliability over 1 week, with r(125) = 0.88. Internal consistency was also found to be adequate with $\alpha = 0.80$.

Measures of Genital Self-Image

The FGSIS[23] is a 7-item validated self-report instrument for determining genital self-image. Each of the 7 items is rated on a 4-point scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The scale was found to have sufficient internal consistency with Cronbach's alpha = 0.88 and one factor that explained 59.23% of the variance. The FGSIS was positively and significantly correlated with all the domains on the Female Sexual Function Index (FSFI), including the total score (r = 0.20, $P < .001$), with the exception of the Desire domain. (Veale et al's 2013 paper describing the Genital Appearance Satisfaction scale[26] was not yet published when this study's protocol was developed.)

Measures of General Sexual Satisfaction

The ISS[24] was designed to assess the degree of sexual dissatisfaction in couples (dyads). Twenty-five items are rated on a 5-point Likert scale. The total score ranges from 0 to 100, with higher scores indicating a greater degree of sexual satisfaction.

Measures of Total Body Esteem

The BES[25] is a 35-item scale looking at different aspects of physical appearance and functioning in men and women. A 5-point scale is used to rate each item ranging from [1] strong negative feelings to [5] strong positive feelings. The overall scale correlates well with self-esteem. Higher scores indicate higher body esteem.

A total of 212 procedures were performed on the 120 participants; these are listed in Table 2. Many women had more than one procedure (eg, LP + RCH; PP/VP + LP, etc.) All study and control group values are found in Tables 3-6. To allow for the passage of time, data was collected from controls at entry and 6 months.

Table 2. Procedures Performed

Procedures	Number performed (%)
Labiaplasty, labia minora	103 (85.8)
Labiaplasty, labia majora	18 (15)
Reduction, clitoral hood (usually performed along with labiaplasty)	70 (58.3)
Perineoplasty (including vaginoplasty [ie, "vaginal rejuvenation"])	21 (17.5)
Total no. of procedures performed on 120 patients (many patients had >1 procedure)	212

[a]The most common combinations were perineoplasty/vaginoplasty with labiaplasty, and labiaplasty-minora with labiaplasty-majora.

Data Analysis

IRB approval was sought and received (data on file). Time periods were compared using *t* tests for independent samples to determine the means and standard deviations of the two groups. In many instances the variances were not equal, so a *Satterthwaite t* test of unequal variances was conducted and results reported. Data were analyzed with the Stata (Statistics/Data Analysis), version 13.0 (StataCorp LP, College Station, TX; Copyright 1985-2015).

Table 3. YBOCS Study Values Compared With Control Values for Statistical Purposes

Group			BDD "Preoccupation"				BDD "Behavior"				BDD "Avoidance"				BDD "Total"			
Time	N (%) Study	N (%) Control	Study	Control	*P* value		Study	Control	*P* value		Study	Control	*P* value		Study	Control	*P* value	
Entry	120 (100)	50 (100)	7.62	1.90	<.0001		6.51	2.50	<.0001		1.775	0.32	<.0001		15.90	4.49	<.0001	
6 mo.	88 (73.3)	42 (84)	4.05	1.83	<.001		4.78	3.10	.016		1.91	0.12	<.0001		10.73	5.05	.001	
12 mo.	80 (66.7)	n/a	2.01	n/a	c/w entry	c/w control	2.61	n/a	c/w entry	c/w control	0.29	n/a	c/w entry	c/w control	4.96	n/a	c/w entry	c/w control
					,.0001	.727			<.0001	.597			<.0001	.135			<.0001	.900
24 mo.	57 (47.5)	n/a	2.12	n/a	<.0001	.625	3.91	n/a	.001	.272	0.15	n/a	<.0001	.370	5.96	n/a	<.0001	.370

c/w, compared with. [a]Equal variances are assumed; higher numbers correlate with dysmorphia.

Table 4. Female Genital Self-Image Scale Results

Time	N (%) Study	N (%) Control	Study	Control	*P* value	
Entry	120 (100)	50 (100)	15.58	22.10	<.0001	
6 mo.	88 (73.3)	42 (84)	21.02	22.50	.104	
12 mo.	80 (66.7)		23.5		c/w entry	c/w control
					<.0001	.192
24 mo.	57 (47.5)		23.94		<.0001	(+) .005

c/w, compared with. [a]Equal variances are assumed; improved genital self-image according to instrument parameters increases score.

Table 5. Index of Sexual Satisfaction

Time	N (%) Study	N (%) Control	Study	Control	*P* value	
Entry	65 (100)	38 (100)	92.15	97.56	<.001	
6 mo.	53 (81.5)	31 (81.6)	95.94	93.48	.407	
12 mo.	48 (73.8)		95.08		c/w entry	c/w control
					.007	.204
24 mo.	39 (60.0)		98.17		<.0001	.060

c/w, compared with. [a]Equal variances are assumed; increased score implies increased sexual satisfaction.

Table 6. Body Esteem Scale

Time	N (%) Study	N (%) Control	BES Total Study	BES Total Control	*P* value		BES #28 Study	BES #28 Control	*P* value	
Entry	106 (100)	43 (100)	123.74	122.40	.724		2.21	3.77	<.001	
6 mo.	71 (67.0)	34 (79.1)	124.76	118.82	.145		3.34	3.71	.363	
12 mo.	62 (58.5)		131.28		c/w entry	c/w control	3.95		c/w entry	c/w control
					.066	.04			<.001	.204
24 mo.	46 (43.4)		126.04		.622	.162	4.20		<.001	.015

c/w, compared with. [a]Item #28 refers to genitalia; equal variances are assumed; higher numbers indicate body esteem.

RESULTS

Baseline Levels for Study and Control Groups

The two groups were demographically and educationally similar. More Caucasians were in the study group than control. Differences were noted in both "length of current relationship" and "length of longest relationship," with control patients having a longer relationship status compared with study patients. The ages were similar, with a mean age for the FGPS group of 32.74 years (SD ± 10.14; range, 18-63 years) and a mean age for the Control group of 33.20 years (SD ± 9.58; range, 18-58 years), $P = .78$. Sexual satisfaction was less in the study group, which also contained a higher proportion of unmarried or unpartnered individuals. At baseline, study and control groups differed in some areas but not in others. Differences were pronounced on the instruments that measured dysmorphic symptomatology, genital self-image, and sexual satisfaction but not in body esteem, with the exception of item #28, "*genitalia*" (Tables 3-6). In all instances, study group participants exhibited dislike of their genitalia.

Effects of FGPS on Body Image

At entry, patients receiving a FGPS procedure scored significantly higher (higher = more "dysmorphic") in all domains

Figure 1. Comparison of total BDD-YBOCS. Increased score = greater dysmorphia/negative body image. See also Table 3.

Figure 2. Female Genital Self-Image Scale. Increased score = greater genital self-image. See also Table 4.

of the BDD-YBOCS than controls ($P < .0001$). Scores for the individual domains of "Preoccupation," "Behavior," "Avoidance," and "Total" (=15.90) of all domains were significantly higher than controls (Total = 6.66) and *in a range considered as mildly-moderately dysmorphic according to Phillips criteria*[22] *and the DSM-IV-TR*.[27] These findings significantly change with time after FGPS surgery. By 1 and 2 years following their procedure, all scores for women receiving FGPS closely mirror the scores of the control population at all postoperative points in time ($P < .0001$) (Table 3; Figure 1).

Effects of FGPS on Genital Self-Image

At entry, the study group scored significantly poorer (lower numbers = lower genital self-image) for genital self-image than the control group (Table 4; Figure 2), but by 6 months, parity was achieved, and it was maintained at 12 months. At 24 months, total study group scores on the FGSIS (24.91) was significantly better than entry, 15.58 ($P < .0001$) and exceeded the control group's scores, 22.10 at entry and 22.50 at 6 months ($P = .005$).

Effects of FGPS on Sexual Satisfaction and Body Esteem

At inclusion, 54% of study participants and 76% of controls elected to complete the Index of Sexual Satisfaction, and 88% of study participants and 86% of controls completed the Body Esteem Scale. For those completing these two additional instruments, the follow-up results roughly paralleled those shown by the two primary instruments.

The ISS numbers paralleled both the BDD-YBOCS and FGSIS. Study patients at entry had statistically significant poorer overall sexual satisfaction as measured by the ISS ($P < .001$), but this figure changed and generally matched the control group at both 6, 12, and 24 months (Table 5; Figure 3). The surgical group showed a significant improvement over entry at 12 and 24 months.

On the BES, scores of the surgical and control groups paralleled each other through time, with the exception of Item #28 on the BES scale, sexual self-esteem. This item scored significantly lower at entry compared with controls ($P < .001$), but significantly improved at 12 and 24 months (Table 6; Figure 4).

Corrections for multiple testing were performed (a Bonferroni correction was applied to produce a familywise error rate of 0.0125[28]) and did not change any of the P values.

DISCUSSION

A robust literature exists confirming a direct relationship between a woman's genital self-image and her sexual satisfaction.[17,21,29-35]

We found, in concordance with both Goodman et al's[17] and Veale et al's studies,[20] that the body, genital, and sexual dissatisfaction shown by study participants at baseline normalized with time following FGPS. Over time, rates of genital, body, and sexual satisfaction among study participants assumed parity with or improved over rates for the control group.

In both the pilot study and present investigation, we assumed that high levels of preoperative genital dissatisfaction followed by significant lessening after surgery suggest that dissatisfaction with a presumed defect is a motivator for FGPS. Preoperatively, women seeking FGPS had significant body (genital) dissatisfaction, which disappeared following surgery.

To what extent are these findings specific to women seeking cosmetic and functionally-genital procedures as opposed to those seeking other elective cosmetic procedures? Evidence of dysmorphic symptoms in patients undergoing cosmetic procedures is strong, with rates ranging between 6% and 53% depending on the measurement instrument.[36] Previous studies report that individuals with

Figure 3. Index of Sexual Satisfaction. Greater score = increased sexual satisfaction. See also Table 5.

Figure 4. Body Esteem Scale. Increased score = greater body esteem. See also Table 6.

true dysmorphia report overall poor outcomes after surgery, including discontent with the procedure, maintenance of body dysmorphic symptoms and, if content with the present surgery, preoccupation with another perceived bodily defect.[36,37]

Improved sexual satisfaction may be related to improvements in confidence or generally improved self-image,[29] such that if a woman perceives she *looks better and/or functions more pleasingly sexually*, she may have more self-confidence and therefore a more satisfying sexual experience. One retrospective study of women undergoing non-genital cosmetic surgical procedures reported significant improvements in sexual satisfaction and body image.[37]

The present study notes sustained abatement of body dissatisfaction symptoms following FGPS surgery involving vulva and vagina, suggesting that these women have body dissatisfaction rather than true dysmorphia. Although we did not measure psychiatric functioning in our sample, others have in a similar population[17] of surgical patients and have noted it to be in the normal range. The apparently positive results from surgery do not diminish the crucial importance of careful counseling and screening of women seeking FGPS procedures.

Demographic differences were noted with regard to relationships and satisfaction with current relationship. Controls tended to be in their present relationship longer ($P = .029$) and generally experienced longer relationships ($P = .040$). In the study group, 38.3% were not in a relationship at the time of their surgery, compared with only 12% of controls. This fact may to some degree account for the significant difference in "Satisfaction with current sexual relationship" noted between the groups. About 83.7% of controls reported satisfaction, compared with only 48.3% of study patients ($P < .0001$). These findings are not unexpected; as women will frequently wait for a time they are not in a sexual relationship to proceed with the genital surgery they have long contemplated.

A practical decision was made to follow controls out for 6 months in time, while study patients were observed for 48 months. As "sham surgery" was not an option, and since controls were other women from the authors practices visiting for a multitude of non-genital plastic-related reasons, and no intervention such as FGPS was undertaken, there appeared no reason to follow longer than 6 months in order to confirm continuity of their scores.

The authors are aware that the BES is presently considered outdated, but it was in use when the recruitment phase began in 2010.

This study is part of a nascent body of evidence-based, prospective literature adding to many retrospective studies, all concordant with the concept that a woman's sexual satisfaction improves with improved body image and function, especially where genitalia are concerned. This data may help inform authors of op-ed articles[38-43] about the outcome of genital plastic or aesthetic procedures.

Because body and genital dissatisfaction has not heretofore been thought to be improved via surgery, surgeons are often warned against operating on patients with BDD. The inability of the BDD-YBOCS instrument to distinguish between "classical" BDD (which is unresponsive to surgical intervention) and *apparent dysmorphia* in the context of genital concerns was hinted at in our 2011 study[17] and is validated here.

These results emphasize the psycho-sexual intensity surrounding a woman's genitalia and perceptions and function thereof. The conventional doctrine that surgery does not improve body dissatisfaction, sometimes labeled "dysmorphia," may need rethinking, at least in the domain of genital revision.

A concern that "cognitive dissonance" may be operative in regards to FGPS has been voiced.[17,44] Whilst this is a legitimate concern with short follow-up periods, one would predict this would be a less likely confounder as patients are followed out in time. The two year follow-up in this group is by far the longest used in a prospective FGPS study.

Only patients actually having surgery were included, as instruments were completed in the waiting room on their day of surgery. Because approximately 96% of women having surgery agreed to participate, the authors feel that the study group is well representative of women contemplating and completing FGPS.

This study benefits from its prospective design, powering, and robust (67%) 1 year follow-up. While the 2-year follow-up rate (47%) suffers from attrition, the one-year statistical trends hold across the board at two years. Although this 2-year rate is not inconsistent with follow-up for elective surgical procedures, the authors are aware that 47% is not robust, and is a weakness of the study. Unfortunately, we have no way to determine rationale ("satisfaction" vs "dissatisfaction") of patients declining to participate as the study is extended in time. These could include mobility precluding contact and both satisfaction and dissatisfaction with disinclination to review "… old business." We have no demographic information on the quite small number of women who elected to not participate at entry, and this is a minor limitation. Additionally, the BDD-YBOCS instrument is usually utilized as an observer-administered report of dysmorphic symptomatology. Our utilization of this instrument modified as a self-report may also be considered a limitation of the study.

As noted above, an increasing number of participants were lost to follow-up over time, as is common in clinical studies, especially those involving elective procedures. Patients received follow-up materials at the anniversaries noted above. If they did not respond within 2 weeks, an office representative telephoned the patient, and sent out a repeat email. If data was not returned, this process was repeated one additional time. The demographics of patients lost to follow-up were compared with those who responded at 12 and 24 months, and no significant differences were noted.

Obtaining a control group for women aged 18 to 63 desiring genital rearrangement was a challenge. To avoid additional confounding, we recruited our controls from the same population and time frame as study patients, namely women visiting our gynecology or plastic surgery practices. We admit that the fact that these were women visiting gynecologists and plastic surgeons may demographically skew data, but certainly paralleled the study group. We consider the control group to be loosely matching the study group; a significantly lower percentage of women not undergoing surgery agreed to participate, not unexpected as they had less investment in research involving a surgical procedure that did not apply to them personally. Thus, control numbers did not match study patients recruited during the baseline entry phase. We acknowledge that the risk of ecological bias is present when a convenience cohort such as ours was chosen in that relationships of groups such as ours does not necessarily hold for individuals. This may be considered a weakness attributed to confounding by the group variable.

It may be argued that women undergoing a surgical procedure are inherently different than a control group that contains no women undergoing genitalia-altering plastic/cosmetic procedures and that this may constitute a confounding bias and that this may be considered a weakness of study design.

We must address our decision to be "lumpers" rather than "splitters" in electing to combine external (vulvar) with the more internal vaginal/perineal procedures. As over half of patients undergoing a vaginal tightening procedure *also had a labiaplasty/clitoral hood reduction*, and since the majority of patients requesting vaginal tightening also related aesthetic image concerns related to introitus/vulvar vestibule appearance, we elected to combine the two subgroups that make up FGPS. We recognize that some may consider this to be a weakness of this study.

CONCLUSION

Increasing numbers of men and women are choosing to electively alter body morphology. Women in increasing numbers are choosing to alter their genital anatomy to gain greater self-esteem, diminish functional discomforts and difficulties, and improve sexual pleasure. As happens with many newer technologies, non-evidence-based marketing campaigns have preceded good medical evidence on outcomes and risks. The extant studies have been mostly retrospective, and editorial opinions unrelated to evidence-based findings have flourished. The data here appear to suggest that there is a form of genital centric body dissatisfaction that is surgically responsive, and that sexual self-image and "satisfaction" are improved with genital aesthetic and functionally related surgery. This study enhances the knowledge base on body image and sexuality effects of elective female genital enhancements and adjustments, and is the largest prospective study with the longest follow-up yet in the literature.

Supplementary Material

This article contains supplementary material located online at www.aestheticsurgeryjournal.com.

Acknowledgements

The authors would like to acknowledge the significant protocol and data management contributions of Lori Brotto, PhD, and the research assistant contributions of Yvonne Erskine and Madeline Hannan-Leith (all from the University of British Colombia, Vancouver, BC, Canada).

Disclosures

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

Funding

The authors received no financial support for the research, authorship, and publication of this article.

REFERENCES

1. Zwier S. "What motivates her": Motivations for considering labial reduction surgery as recounted on women's online communities and surgeons' websites. *Sex Med*. 2014;2:16-23.
2. Goodman MP, Placik OJ, Benson RH III, et al. A large multicenter outcome study of female genital plastic surgery. *J Sex Med*. 2010;7:1565-1577.
3. Rouzier R, Louis-Sylvestre C, Paniel BJ, Haddad B. Hypertrophy of labia minora: experience with 163 reductions. *Am J Obstet Gynecol*. 2000;182:35-40.
4. Miklos JR, Moore RD. Labiaplasty of the labia minora: patients indications for pursuing surgery. *J Sex Med*. 2008;5:1492-1495.
5. Pardo J, Sola V, Ricci P, Guiloff E. Laser labioplasty of the labia minora. *Int J Gynecol Obstet*. 2006;93:38-43.
6. Pardo JS, Solà VD, Ricci PA, Guiloff EF, Freundlich OK. Colpoperineoplasty in women with a sensation of a wide vagina. *Acta Obstet Gynecol Scand*. 2006;85:1125-1127.
7. Alter GJ. Aesthetic labia minora and clitoral hood reduction using extended central wedge resection. *Plast Reconstr Surg*. 2008;122:1780-1789.
8. Maas SM, Hage JJ. Functional and aesthetic labia minora reduction. *Plast Reconstr Surg*. 2000;105:1453-1456.
9. Giraldo F, González C, de Haro F. Central wedge nymphectomy with a 90-degree Z-plasty for aesthetic reduction of the labia minora. *Plast Reconstr Surg*. 2004;113:1820-1825.
10. Munhoz AM, Filassi JR, Ricci MD, et al. Aesthetic labia minora reduction with inferior wedge resection and superior pedicle flap reconstruction. *Plast Reconstr Surg*. 2006;118:1237-1247.
11. Goodman MP. Female cosmetic genital surgery. *Obstet Gynecol*. 2009;113:154-159.
12. Hamori C. Aesthetic surgery of the female genitalia: Labiaplasty and beyond. *Plast Reconst Surg*. 2014;134:661-673.
13. Tepper OM, Wulkan M, Matarasso A. Labioplasty: anatomy, etiology, and a new surgical approach. *Aesthet Surg J*. 2011;31(5):511-518.
14. Matlock DL, Simopoulos A. FOR: cosmetic vulvar surgery is a safe and effective option for our patients. *BJOG*. 2014;121:767.
15. Cartwright R, Cardozo L. FOR: women should be free to opt for cosmetic genital surgery. *BJOG*. 2014;121:767.
16. Bramwell R, Morland C, Garden AS. Expectations and experience of labial reduction: a qualitative study. *Obstet Gynecol Surv*. 2008;63:1493-1499.
17. Goodman MP, Fashler S, Miklos JR, Moore RD, Brotto LA. The sexual, psychological, and body image health of women undergoing elective vulvovaginal plastic/cosmetic procedures: A pilot study. *Am J Cosmetic Surg*. 2011;28:219-226.
18. Crouch NS, Deans R, Michaela L, Liao L, Creighton S. Clinical characteristics of well women seeking labial reduction surgery: A prospective study. *BJOG*. 2011;118:1507-1510.
19. Veale D, Eshkevari H, Ellison N, et al. Psychological characteristics and motivation of women seeking labiaplasty. *Psychol Med*. 2014;44:556-566.
20. Veale D, Naismith I, Eshkevari E, et al. Psychosexual outcome after labiaplasty: a prospective case-comparison study. *Int Urogynecol J*. 2014;25(6):831-839.
21. Zielinski R, Miller J, Low LK, Sampselle C, DeLancey JO. The relationship between pelvic organ prolapse, genital body image, and sexual health. *Neurourol Urodyn*. 2012;31(7):1145-1148.
22. Phillips KA, Hollander E, Rasmussen SA, Aronowitz BR, DeCaria C, Goodman WK. A severity rating scale for body dysmorphic disorder: development, reliability, and validity of a modified version of the Yale-Brown Obsessive Compulsive Scale. *Psychopharmacol Bull*. 1997;33(1):17-22.
23. Herbenick D, Reece M. Development and validation of the Female Genital Self-Image Scale. *J Sex Med*. 2010;7:1822-1830.
24. Hudson WW, Harrison DF, Crosscup PC. A short-form scale to measure sexual discord in dyadic relationships. *J Sex Res*. 1981;17:157-174.
25. Franzio SL, Shields SA. The Body Esteem Scale: Multidimensional structure and sex differences in a college population. *J Pers Assess*. 1984;48:173-178.
26. Veale D, Eshkevari E, Ellison N, Cardozo L, Robinson D, Kavouni A. Validation of genital appearance satisfaction scale and the cosmetic procedure screening scale for women seeking labiaplasty. *J Psychosom Obstet Gynaecol*. 2013;34(1):46-52.
27. Diagnostic and Statistical Manual of Mental Disorders. 4th edition. *Text Revision*. Washington, DC: American Psychiatric Publishing; 2000.
28. Hochberg Y, Tamhane AC. *Multiple Comparison Procedures*. New York, NY: Wiley; 1987.
29. Pujols Y, Meston CM, Seal BN. The association between sexual satisfaction and body image in women. *J Sex Med*. 2010;7:905-916.
30. Shick VR, Calabrese SK, Rima BN, Zucker AN. Genital appearance dissatisfaction: Implications for women's genital image self-consciousness, sexual esteem, sexual satisfaction, and sexual risk. *Psychol Women Q*. 2010;34:394-404.
31. Berman L, Windecker M. The relationship between women's genital self-image and female sexual function: A national survey. *Current Sex Heal Rep*. 2008;5:199-207.
32. Woertman L, van den Brink P. Body image and female sexual function and behavior: a review. *J Sex Res*. 2012;49:184-211.
33. Ackard DM, Kearney-Cooke A, Peterson CB. Effect of body self-image on women's sexual behaviors. *Int J Eat Disord*. 2000;28:422-429.
34. Lowenstein L, Gamble T, Sanses TV, et al. Sexual function is related to body image perception in women with pelvic organ prolapse. *J Sex Med*. 2009;6(8):2286-2291.

35. Davison SL, Bell RJ, LaChina M, Holden SL, Davis S. The relationship between self-reported sexual satisfaction and general well-being in women. *J Sex Med*. 2009;6: 2690-2697.
36. Crerand CE, Franklin ME, Sarwer DB. Body dysmorphic disorder and cosmetic surgery. *Plast Reconstr Surg*. 2006;118:167e.180e.
37. Crerand CE, Phillips KA, Menard W, Fay C. Nonpsychiatric medical treatment of body dysmorphic disorder. *Psychosomatics*. 2005;46:549-555.
38. Iglesia CB. Cosmetic gynecology and the elusive quest for the "perfect" vagina. *Obstet Gynecol*. 2012;119:1083-1084.
39. Liao LM, Taghinejadi N, Creighton SM. An analysis of the content and clinical implications of online advertisements for female genital cosmetic surgery. *BMJ Open*. 2012;21:2.
40. Liao LM, Creighton SM. Requests for cosmetic genitoplasty: How should healthcare providers respond? *BMJ*. 2007;334:1090-1092.
41. Braun V. In search of (better) sexual pleasure: female genital cosmetic surgery. *Sexualities*. 2005;8:407-424.
42. Rogers RG. Most women who undergo labiaplasty have normal anatomy: We should not perform labiaplasty. *Am J Obsteg Gynecol*. 2014;211:218-221.
43. Vaginal "rejuvenation" and cosmetic procedures. ACOG Committee Opinion No. 378. American College of Obstetricians and Gynecologists. *Obstet Gynecol*. 2007;110: 737-738.
44. Homer JJ, Sheard CE, Jones NS. Cognitive dissonance, the placebo effect and the evaluation of surgical results. *Clin Otolaryngol Allied Sci*. 2000;25:195-199.