ORIGINAL RESEARCH—SURGERY

Surgical Treatment of Vulvar Vestibulitis Syndrome: Outcome Assessment Derived from a Postoperative Questionnaire

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ABSTRACT

Introduction. Vulvar vestibulitis syndrome (VVS) is the most common pathology in women with sexual pain. Surgery for VVS was first described in 1981. Despite apparently high surgical success rates, most review articles suggest that surgery should be used only "as a last resort." Risks of complications such as bleeding, scarring, and recurrence of symptoms are often used to justify these cautionary statements. However, there are little data in the peer-reviewed literature to justify this cautionary statement.

Aims. To determine patient satisfaction with vulvar vestibulectomy for VVS and the rate of complications with this procedure.

Methods. Women who underwent a complete vulvar vestibulectomy with vaginal advancement by one of three different surgeons were contacted via telephone by an independent researcher between 12 and 72 months after surgery.

Main Outcome Measures. The primary outcome measurement of surgical success was overall patient satisfaction with surgery. Additional secondary outcome measurements included improvement in dyspareunia, changes in coital frequency, and occurrence of surgical complications.

Results. In total, 134 women underwent surgery in a 5-year period. An independent research assistant was able to contact 106 women, and 104 agreed to participate in the study. Mean duration since surgery was 26 months. A total of 97 women (93%) were satisfied, or very satisfied, with the outcome of their surgery. Only three patients (3%) reported persistently worse symptoms after surgery and only seven (7%) reported permanent recurrence of any symptoms after surgery. Prior to surgery, 72% of the women were completely apareunic; however, after surgery, only 11% were unable to have intercourse.

Discussion. In this cohort of patients, there was a high degree of satisfaction with surgery for VVS. In addition, the risks of complications with this procedure were low, and most complications were transient and the risk of recurrence after surgery was also found to be low. **Goldstein AT, Klingman D, Christopher K, Johnson C, and Marinoff SC. Surgical treatment of vulvar vestibulitis syndrome: Outcome assessment derived from a postoperative questionnaire. J Sex Med 2006;3:923–931.**

Key Words. Vaginal Reconstructive Surgery; Causes and Treatment of Sexual Pain Disorders; Dyspareunia

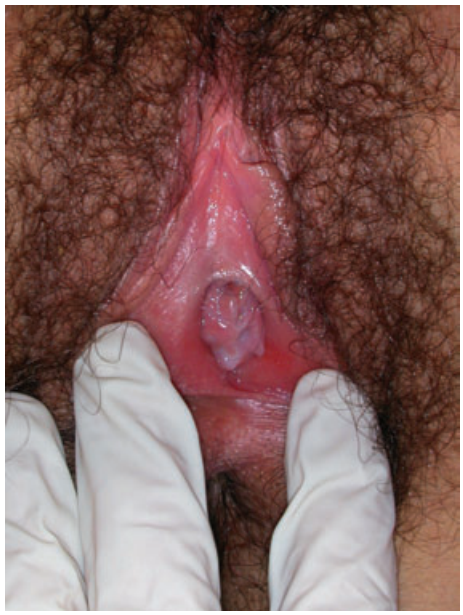

Figure 1 Vestibular erythema in vulvar vestibulitis syndrome.

Introduction

Vulvar vestibulitis syndrome (VVS) (vestibulodynia, vestibular adenitis, localized vulvar dysesthesia) is one of the most common causes of sexual pain in women [1,2]. Patients with VVS experience severe introital dyspareunia that is frequently described as burning, cutting, or searing, upon vaginal penetration. Pain is localized to the tissue of the vulvar vestibule which is derived from the primitive urogenital sinus (Figure 1) [3]. Women who have had introital dyspareunia ever since their first attempt at intercourse (or tampon insertion) have primary VVS, whereas women who had an initial interval of pain free intercourse prior to the onset of symptoms are described as having secondary VVS. While the underlying pathophysiology of VVS has not been completely elucidated, several recent studies have confirmed a proliferation of c-afferent nociceptors in the vestibular mucosa [4–8]. These studies have shown up to a 10-fold increase in density of nerve endings in the vestibular mucosa of women with VVS [5]. This neuronal hyperplasia may explain the extreme allodynia women experience with VVS. Recent studies have suggested that in some cases, primary VVS may be the result of a congenital neuronal hyperplasia in the tissue derived from the primitive urogenital sinus [9,10]. Additional studies have suggested that secondary VVS may be caused by nerve growth factor-initiated proliferation of nociceptors mediated by mast cells [5]. Additional factors such as genetic polymorphisms in genes, down-regulation of hormonal receptors, or hormonal alterations caused by oral contraceptive pills may also play a role in the pathogenesis of VVS [11–14].

There are more than 20 different treatments reported in the medical literature for VVS, including topical and intra-lesional steroids [15], interferon [16], biofeedback [17], capsaicin [18], lidocaine [19], intravaginal physical therapy [20], amitriptyline [21], cognitive–behavioral therapy [22], acupuncture [23], nitroglycerine [24], and dietary changes [25]. Safety and efficacy data concerning these treatment regimens are published, for the most part, in small case series, which are neither randomized nor placebo-controlled.

Woodruff first described surgery for VVS in 1981 calling it a "modified perineoplasty" [26]. Since that time, there have been 32 different case series compromising a total of 1,275 patients (Table 1). These reports represent several different surgical procedures as there have been modifications of the basic excision and reconstructive procedure. In the original procedure, Woodruff removed a semicircular segment of perineal skin, the mucosa of the posterior vulvar vestibule, and the posterior hymeneal ring. Three centimeters of the vaginal mucosa was then undermined and approximated to the perineum.

While there are flaws in the peer-reviewed publications that examine surgery for VVS, 28 of the 32 articles demonstrate at least an 80% success

Table 1 Sexual functioning after vulvar vestibulectomy surgery

	N (%)
Quality of sex life (N = 104)	
Much better/better	91 (87)
Same	11 (11)
Worse	2 (2)
Current level of pain during sex (N = 104)	
No pain	54 (52)
Discomfort that does not interference with sex	26 (25)
Discomfort that does with interference sex	12 (12)
Apareunia	12 (12)
Sexual activity 3 months prior to surgery (N = 104)	
None	77 (74)
1–2 times/month	20 (19)
2–3 times/month	7 (7)
Sexual activity since surgery (N = 104)	
None	12 (11)
1–2 times/month	34 (33)
2–3 times/month	58 (56)
Ability to achieve orgasm (N = 104)	
Increased	10 (10)
Decreased	9 (9)
No change	85 (81)

rate with surgical management of VVS [27]. Yet, despite this apparently high success rate, most review articles and lectures suggest that surgery should be used only "as a last resort" [28–30]. Risks of complications such as bleeding, infection, wound dehiscence, hematoma, scarring, increased pain, unfavorable cosmesis, inhibition of orgasm, Bartholin's gland cyst formation, and recurrence of symptoms are often used to justify these cautionary statement. However, there is very little available peer-reviewed medical literature to quantify rates of complications with surgery for VVS. This information is essential to accurately counsel women contemplating surgery for VVS.

Materials and Methods

In total, 134 women had vulvar vestibulectomy with vaginal advancement performed by one of three different gynecologic surgeons between October 1, 1997 and October 1, 2003. Women were considered candidates for surgery if they had pain limited to the vulvar vestibule. They were excluded if they had vulvar pain that was not limited to the vestibule (dysesthetic vulvodynia [DV]), or they had pelvic floor muscle hypertonicity (PFMH) (pelvic floor dysfunction, vaginismus). Although the women were not required to have used conservative treatments prior to surgery, 99 of the 104 women tried at least one conservative treatment prior to surgery. A woman was considered a candidate for surgery if she, and her surgeon, determined that she was willing and capable to follow the postoperative care outlined below. In addition, she had to have at least two thorough discussions about available conservative treatment options prior to consenting to surgery. A psychological consultation was not a prerequisite for surgery.

The procedure performed on all women was a modification of the original Woodruff procedure. Modifications of the original procedure were developed by the three surgeons to minimize complications that have been associated with the original procedure [31]. Specifically, the entire vulvar vestibule is outlined and then infiltrated with Marcaine 0.5% with epinephrine for intraoperative hemastasis and postoperative pain control (Figure 2). The mucosa of the anterior vestibule is excised even when this area is not painful as this lowers the chance of postoperative symptom recurrence. The mucosa of the entire vestibule is then excised to a point 3 millimeters past the hymenal ring, thereby removing the entire hymen.

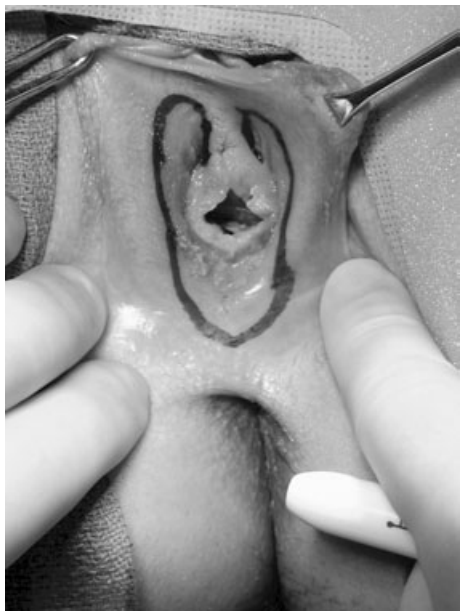

Figure 2 The entire vulvar vestibule is outlined prior to excision.

The vaginal mucosa is then separated off the recto-vaginal fascia to create a vaginal advancement flap (Figure 3). The defects in the anterior vestibule are then closed with 4–0 Vicryl and the vaginal mucosa is then anchored in an advanced position with six mattress stitches of 2–0 Vicryl. These mattress stitches are positioned in an anterior-posterior direction so that the diameter of the

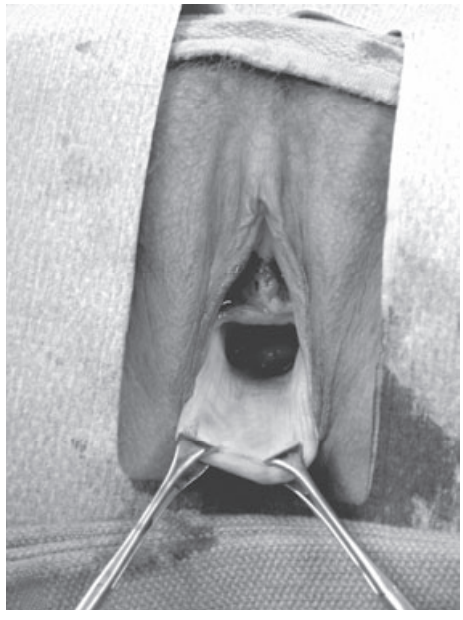

Figure 3 After excising the vestibular mucosa, a vaginal advancement flap is created.

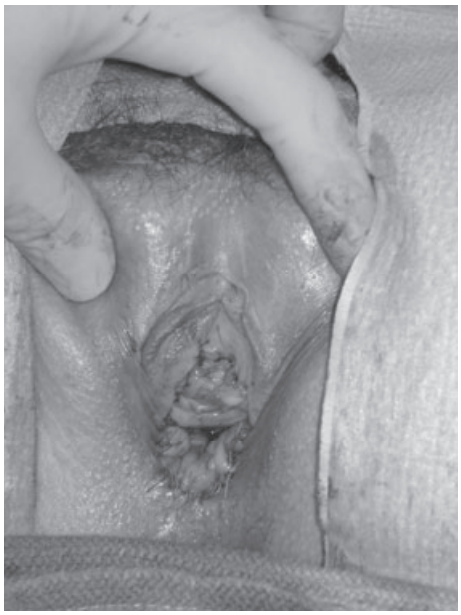

Figure 4 The vaginal advancement flap is approximated to the perineum.

vagina is not compromised. The mattress stitches minimize the risk of postoperative hematoma, prevent curling of the advancement flap, and minimize the risk of dehiscence of the advancement flap. The procedure is completed by approximating the vaginal mucosa to the labia minora and perineum with approximately 20 interrupted stitches of 4–0 Vicryl (Figure 4). Using interrupted stitches minimizes the risks of hematoma, wound dehiscence, and postoperative scarring.

All patients applied ice to the perineum postoperatively for 7 days, used Sitz baths for 6 weeks, and remained on modified bed-rest for 2 weeks. Six weeks after surgery, the women began vaginal dilatation with Pyrex dilators.

Patients were contacted between 12 and 72 months after their surgery (mean 26 months). Patients were contacted by an independent research assistant via telephone. The research assistant, a medical student on a research elective, attempted to contact the patients with telephone numbers that were in the medical record. If the telephone numbers were no longer valid, an Internet search engine was used to find current phone numbers. Of the 134 women who had undergone surgery in the aforementioned 6-year period, 106 of the women were contacted (79%). An IRB-approved questionnaire was administered by the independent research assistant after obtaining verbal informed consent (Appendix 1). Participants were assured that their responses would be confidential, and that their surgeon would be blinded to individual responses. A thorough chart review was performed after contacting individual patients.

Results

Ninety-one women (87%) reported that their sex lives were much better or better than before surgery. Eleven women (11%) reported no change in their sex and two (2%) women reported that their sex lives were worse since surgery (Table 1). In the 3 months prior to surgery, 77 women (74%) were apareunic because of severe dyspareunia, and 20 of the remaining 27 women (19%) had intercourse no more than twice monthly. After the surgery, 58 women (56%) were having intercourse at least three times per month, and only 12 women (11%) were apareunic. Eighty-five women (81%) did not have any change in their ability to achieve orgasm after surgery, 10 women (10%) had an increased ability to achieve orgasm and nine women (9%) had decreased ability to achieve orgasm.

Eighty-seven women (83%) reported no recurrence of symptoms of dyspareunia after surgery, whereas 10 women (10%) had transient recurrence of dyspareunia, and seven (7%) had permanent recurrence of dyspareunia (Table 2). Ninety-four women (90%) reported no worsening of symptoms from the surgery; whereas seven women (7%) had transient worsening of symptoms and three (3%) had some permanent wors-

Table 2 Patient satisfaction with surgical outcomes

	N (%)
Recurrence of symptoms (N = 104)	
Yes—transient	10 (10)
Yes—permanent	7 (7)
No	87 (83)
Symptoms made worse by surgery (N = 104)	
Yes—transiently	7 (7)
Yes—permanently	3 (3)
No	94 (90)
Cosmetic changes (N = 104)	
Very significant	3 (3)
Significant	4 (4)
Not significant	97 (93)
In retrospect, knowing your results and discomfort of surgery, would you have surgery again (N = 104)	
Yes	97 (93)
No	3 (3)
Unsure	4 (4)
Would you recommend surgery to another woman with similar symptoms (N = 104)	
Yes	97 (93)
No	1 (1)
Unsure	6 (6)

ening of symptoms. Ninety-seven women (93%) considered the cosmetic results of the surgery to be insignificant, whereas four women (4%) considered them significant and three women (3%) considered the cosmetic results to be very significant. Ninety-seven patients (93%) answered that in retrospect, knowing the discomfort of their surgery, and the results of their surgery, they would have the surgery again, and would also recommend the surgery to other women with similar complaints.

No patients had postoperative infection, significant wound dehiscence, or significant scarring. One patient had a hematoma that required evacuation, and two patients had a Bartholin's gland cyst that required in-office marsupialization.

Discussion

A review of the 32 studies that have examined surgery for VVS reveals that the surgical success rate was greater than 80% in 28 of these studies (Table 3). However, these studies are frequently criticized because the outcome criteria for "surgical success" are often poorly defined and standard procedures to assess surgical success are rarely

Table 3 Review of vestibulectomy studies

Authors	Procedure	Number of patients	Length of follow-up (in months)	Complete resolution of pain	Partial (significant) resolution of pain	No significant resolution of pain	Complete or significant reduction in pain
Woodruff et al. [26]	Perineoplasty	18	6–60	18	0	0	100
Woodruff and Parmley [40]	Perineoplasty	14	6–36	12	2	0	100
Woodruff and Friedrich [41]	Perineoplasty	44	NS*	36	6	2	95
Peckham [42]	Perineoplasty	9	NS	9	0	0	100
Friedrich [43]	Perineoplasty	38†	NS	23		15	60
Michlewitz [44]	Perineoplasty	16	NS	16			100
Bornstein and Kaufman [45]	Perineoplasty (modified)	20	6–36	14	4	2	90
Marinoff and Turner [46]	Perineoplasty	73	12–36	60	11	2	97
Westrom [47]	Modified vestibulectomy	12	15–19	10	1	1	92
Schover [48]	Vestibuloplasty	38	1–24	18	14	6	84
Mann [49]	Perineoplasty	56	6–54	37	12	7	88
Barbaro [50]	Modified vestibulectomy	21	1–3	19	2		100
Abramov [51]	Vestibulectomy	7	12	7			100
Bornstein [52]	Perineoplasty	11	6	9	1	1	91
Foster [53]	Perineoplasty	93	>48	51	31	11	88
Chaim [54]	Perineoplasty (modified)	16	10–70	15		1	94
de Jong [55]	Perineoplasty	14	36–84	3	3	8	43
Baggish [56]	Vestibulectomy	15	12	13		2	87
Goetsch [57]	Vestibuloplasty	12	6–72	10	2		100
Kehoe [58]	Modified vestibulectomy	37	3–34	22	11	4	89
Weijmar [59]	Vestibulectomy	13	2–36	7	4	2	85
Bergeron [60]	Vestibulectomy	38	13–120	24		14	68
Bergeron [22]	Vestibulectomy	22	6	15		7	68
Bornstein [34]	Perineoplasty	79	12	60	19		100
Berville [61]	Vestibulectomy	12	8	6	4	2	83
Marinoff [62]	Perineoplasty	107	3–48	70	18	19	82
Westrom [6]	Modified vestibulectomy	42	6	33	5	4	90
Kehoe [63]	Vestibulectomy	54	2–42	33	15	6	89
Hopkins [64]	Perineoplasty	21	NS	19		2	90
McKormack [65]	Perineoplasty	42	12–120	16	19	7	83
Schneider [66]	Vestibulectomy	54	6	30	15	9	83
Gaunt [67]	Vestibulectomy	42	6–24	28	10	4	90
Lavy [68]	Modified vestibulectomy	59	6–120	39	7	7	87
Traas [69]	Vestibulectomy	126	2–264	76	37	13	89
Total		1,275					

*NS: length of follow-up not stated.
†Includes 13 patients who had a previous failed surgery performed by another surgeon.

used. In addition, evaluation of success in these studies is non-blinded, rendering it biased and highly subjective.

Therefore, this study was designed to address the aforementioned deficiencies. In this study, several specific outcome measurements were used to assess surgical success. The primary measure of success was overall patient satisfaction with surgery. Additional secondary outcome measurements included resolution or significant improvement in dyspareunia, increased coital frequency, and absence of surgical complications. In this cohort of patients, 93% of patients were satisfied, or very satisfied, with their surgical outcome. The authors believe that this very high level of satisfaction was achieved for several reasons. As with any surgical procedure, patient selection is extremely important. It has been shown in the literature that women with active DV and/or PFMH have a lower surgical success rate [32–34]. Therefore, women with DV or PFMH were not offered surgery until these concurrent problems were successfully treated. Forty-three of the 106 women had one or both of these conditions upon initial presentation, but were successfully treated for DV or PFMH prior to undergoing surgery. In addition, modifications of the original Woodruff procedure described above minimize the risks of postoperative hematoma, wound dehiscence, and postoperative scarring. Modified bed-rest for the 2 weeks after the procedure minimizes postoperative complications and aggressive use of vaginal dilators beginning 6 weeks after surgery prevents postoperative vaginal stenosis and leads to early resumption of intercourse.

This study is one of the first to quantify the risks that are frequently mentioned when discussing this procedure. These data will allow physicians to accurately discuss the risks of this procedure when deciding on treatment options with their patients or when obtaining informed consent for this procedure.

This study was limited because it did not incorporate validated measures of assessing sexual function such as use of the Female Sexual Function Index and Female Sexual Distress Scale at various time intervals pre- as well as postoperatively. In addition, in future studies age-matched controls with VVS who choose not to undergo surgery should be compared with women who have surgery along dimensions of sexual functioning and quality of life measures.

Furthermore, women who made the decision to undergo surgery may have experienced cognitive dissonance reduction and biased scanning in response to questions on the questionnaire which elicited whether they would undergo surgery again knowing the discomforts and surgical outcomes. The concepts of cognitive dissonance reduction and biased scanning assume that the influence of one's past behavior on future decisions is mediated by attempts to confirm the legitimacy of the behavior once one becomes aware of its occurrence, and this can occur with very little thought about the behavior in question and the consequences of engaging in it [35]. Janis and King [36] first postulated the theory of biased scanning wherein after people have engaged in a particular behavior, they often conduct a biased search of memory for previously acquired knowledge that confirms the legitimacy of their act. They may then combine their estimates of the likelihood and desirability of these consequences to form a new attitude toward the behavior [37], and this attitude, in turn, might influence both their intentions to repeat the behavior and their actual decision to do so when the occasion arises [35].

The theory of cognitive dissonance assumes that when people become aware that they have voluntarily performed a behavior that contradicts the implications of a previously formed attitude, they experience discomfort (dissonance) [38,39]. Therefore, they attempt to rationalize their counter-attitudinal behavior by convincing themselves that they had good reasons for engaging in it. This rationalization is likely to produce a change in their estimates of both the likelihood and desirability of the behavior's specific consequences and therefore a revision of the attitude for which these estimates have implications. The new attitude, in turn, may provide the basis for their future behavioral decisions [35].

In this study, biased scanning and cognitive dissonance reduction may have been introduced in women who underwent vulvar vestibulectomy with vaginal advancement. Based on these theories, patients with VVS may still recommend a surgical intervention for other women in order to create less dissonance, even if their surgical outcome may in fact have been either unfavorable or resulted in no change in their current health status.

Lastly, while there have been several recent studies showing promising new treatment for VVS including topical lidocaine [18] and capsaicin [17], it is not known whether these treatment options temporize the symptoms of VVS or offer a long-term cure for VVS. As the majority of women with

VVS are in the third decade of life, it is important to question the benefit of treatment options that are palliative rather than curative. Therefore, until there is evidence that there are other treatments for VVS that offer cure rates that are comparable to surgery, vestibulectomy should not be reserved as a treatment of last resort.

In summary, in this cohort of patients, there was a high degree of satisfaction with surgery for VVS. In addition, the risks of complications with this procedure were low, with most complications being transient. The risk of recurrence after surgery was also found to be low.

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Appendix 1 Telephone Interview Questionnaire

1. In retrospect, knowing the discomforts of surgery and the results of your surgery, would you have surgery again? Yes/No/Unsure.
2. Knowing the discomforts of surgery and the results of your surgery, would you recommend this surgery to another woman with similar symptoms? Yes/No/Unsure.
3. In general, is your sex life—much better, better, the same, or worse, as compared with before the surgery? Much better/Better/Same/Worse.
4. What is your current level of pain during sex: 0—no pain, 1—discomfort that does not interfere with sex, 2—discomfort that frequency interferes with sex, 3—unable to have sex? Or N/A—not in a relationship.
5. Were any symptoms made worse by the surgery? Yes/No. If yes, what were they?
6. In the last 3 months, on average, how many times did you have intercourse per month?
7. Have you had a recurrence of your symptoms since having surgery? If yes, what were they and do these symptoms persist?
8. Has your ability to have orgasm been affected by this surgery? Increased/Decreased/Same.
9. Would you consider the cosmetic changes associated with the procedure to be: very significant, significant, not significant?