Surgical and Behavioral Treatments for Vestibulodynia

Two-and-One-Half–Year Follow-up and Predictors of Outcome

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OBJECTIVE: To estimate whether treatment gains for provoked vestibulodynia participants randomly assigned to vestibulectomy, biofeedback, and cognitive–behavioral therapy in a previous study would be maintained from the last assessment—a 6-month follow-up—to the present 2.5-year follow-up. Although all three treatments yielded significant improvements at 6-month follow-up, vestibulectomy resulted in approximately twice the pain reduction as compared with the two other treatments. A second goal of the present study was to identify predictors of outcome.

METHODS: In a university hospital, 51 of the 78 women from the original study were reassessed 2.5 years after the end of their treatment. They completed 1) a gynecologic examination involving the cotton-swab test, 2) a structured interview, and 3) validated pain and sexual functioning measures.

RESULTS: Results from the multivariate analysis of variance conducted on the pain measures showed a significant time main effect ($P<.05$) and a significant treatment main effect ($P<.01$), indicating that participants had less pain at the 2.5-year follow-up than at the previous 6-month follow-up. Results from the multivariate analysis of variance conducted on sexual functioning measures showed that participants remained unchanged between the 6-month and 2.5-year follow-up and that there were no group differences. Higher pretreatment pain intensity predicted poorer outcomes at the 2.5-year follow-up for vestibulectomy ($P<.01$), biofeedback ($P<.05$), and cognitive–behavioral therapy ($P<.01$). Erotophobia also predicted a poorer outcome for vestibulectomy ($P<.001$).

CONCLUSION: Treatment gains were maintained at the 2.5-year follow-up. Outcome was predicted by pretreatment pain and psychosexual factors.

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LEVEL OF EVIDENCE: II

A recent population-based study suggests that 16% of women in the United States alone may experience chronic unexplained vulvar pain, or vulvodynia, during their lifetime.[1] In addition to disrupting sexual functioning, there is preliminary evidence to suggest that this pain problem can adversely affect general psychological well-being and overall quality of life.[2,3] Despite its high prevalence and associated negative sequelae, there is a dearth of controlled treatment outcome studies focusing on vulvodynia. Moreover, posttreatment follow-ups are generally of limited duration or vary within studies, rendering it difficult to assess long-term treatment gains.

Provoked vestibulodynia, formerly referred to as vulvar vestibulitis syndrome, is suspected to be the most frequent type of vulvodynia in premenopausal women.[4] It is characterized by a severe, burning, or sharp pain that occurs in response to pressure localized to the vestibule, with prevalence estimates ranging from 12% in the general population[5] to 15% in general gynecologic practice.[6] Although there are now several published studies evaluating different treatment approaches for vestibulodynia, there are only a handful of randomized trials,[7,8] resulting in a hodgepodge of interventions for which there is little empirical support. Thus, current guidelines and recommendations are largely

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based on clinical observations and uncontrolled data rather than being anchored in findings from rigorous studies.[9] Of particular concern is the lack of long-term follow-up characterizing most research in this area, in a context where we know very little about the natural history of vestibulodynia and where the magnitude of placebo effects resulting from pain interventions is thought to be high.[10] Additionally, apart from a few exceptions,[11] there have been no attempts to identify factors that could assist health professionals in determining which treatment might work best for whom, particularly in the case of more invasive options such as vestibulectomy.

We conducted a randomized treatment outcome study of provoked vestibulodynia comparing vestibulectomy, group cognitive–behavioral therapy, and electromyographic biofeedback.[12] Although all three treatments yielded significant improvements at posttreatment and at 6-month follow-up on self-reported pain during intercourse, pain during the cotton-swab test, and psychosexual functioning, vestibulectomy resulted in approximately twice the pain reduction (47–70% depending on pain measure) as compared with the two other treatments (19–38%).

The present study is an extension of our original randomized trial, with a view to investigating the long-term effect of surgical and behavioral treatments for provoked vestibulodynia, in addition to examining predictors of outcome. More specifically, the purposes of this study were to 1) assess whether treatment gains resulting from vestibulectomy, biofeedback, and cognitive–behavioral therapy would be maintained from the 6-month to the 2.5-year follow-up with regard to pain and sexual functioning, and 2) identify predictors of pain outcomes for the above treatments.

MATERIALS AND METHODS

Participants were 78 women diagnosed with provoked vestibulodynia who completed treatment in the original study. They were selected from a pool of 168 women suffering from different types of dyspareunia recruited between January and July 1996 through local media announcements and professional referral. Participants met the following inclusion criteria: 1) pain during intercourse that is a) subjectively distressing, b) occurs(ed) on most intercourse attempts, and c) has lasted for at least 6 months (women who stopped attempting intercourse as a result of the pain were included if the pain could be confirmed during the gynecologic examinations); 2) pain limited to intercourse and other activities involving vestibular pressure (eg, bicycling); 3) moderate to severe pain in one or more locations of the vestibule during the cotton-swab test (this was operationalized as a minimum average patient pain rating of 4 on a scale of 0 to 10). Exclusion criteria were the following: 1) pelvic or vulvar pain not clearly linked to intercourse; 2) presence of one of the following: a) major medical and/or psychiatric illness, b) active infection, and c) vaginismus; 3) ongoing treatment for dyspareunia; 4) pregnancy; 5) aged younger than 18 years or older than 50 years. Participants meeting the study selection criteria in the original study had been randomly assigned to one of three treatments using blocked randomization.

These women were contacted again by an independent, trained clinical associate 2.5 years after the end of their treatment–a single-blind procedure. Indeed, this interviewer was never involved in the randomization process, and participants were carefully instructed never to reveal their treatment condition to the interviewer during the assessment. If interested in taking part in the present long-term follow-up, they were scheduled for an appointment at a university hospital, where study procedures were explained and informed consent was obtained. They then 1) underwent a gynecologic examination involving vulvar pain ratings during the cotton-swab test, 2) took part in a structured interview, and 3) completed validated pain and sexual functioning measures. This study protocol was approved by the McGill Institutional Ethics Review Board.

With the exception of the vestibular pain index, which was part of the gynecologic examination, the following outcome measures were administered by an independent clinical associate at the first visit of the participant selection process (pretreatment), at posttreatment, and at 6-month and 2.5-year follow-ups. The present study focuses on the 2.5-year follow-up.

Pain-dependent measures included 1) a vestibular pain index, resulting from participant pain ratings taken during the cotton-swab test at six different points in the vulvar vestibule and averaged to form one single index of vestibular pain. Such vestibular participant pain ratings have been found to correlate significantly between gynecologists for each palpation site, with correlation coefficients ranging from 0.42 to 0.64, $P<.001$[13]; 2) a self-report measure of the intensity of painful intercourse on a scale of 0 to 10, taken during a structured interview; 3) the Pain Rating Index of the McGill Pain Questionnaire,[14] and 4) the Sensory scale of the McGill Pain Questionnaire. The McGill Pain Questionnaire is a widely used, reliable, and valid multidimensional measure of pain that includes three scales (sensory, evaluative, and affective) and three indices (pain rating index, number of words chosen, and present pain intensity). For these

last two measures, participants were asked to provide global ratings of the pain they had experienced in the last 6 months.

Sexual function–dependent measures included 1) the Global Sexual Functioning score of the Sexual History Form,[15] which evaluates desire, arousal, orgasm, frequency of sexual activities, and overall sexual satisfaction and has demonstrated good reliability and validity[16]; 2) a self-report measure of frequency of intercourse per month, taken during the structured interview; 3) the Sexual Opinion Survey,[17] a reliable and valid 21-item measure of individual differences in predispositions to react positively or negatively to sexual cues (erotophobia-erotophilia).

Psychological adjustment was assessed using the Global Severity Index of the Brief Symptom Inventory,[18] a reliable and valid 53-item self-report inventory of psychological symptom patterns. Confidence in treatment was assessed at the first treatment session or during the presurgery appointment using the following question rated on a scale of 0 (not at all) to 10 (completely): "How confident are you that the present treatment will improve your pain condition?"

The study's sample size was calculated using effect sizes yielded by our previous retrospective study focusing on vestibulectomy,[19]–which were approximately .40 for pain outcomes. These numbers represent large effect sizes, according to Cohen.[20] To detect a large difference between three independent sample means with a power of at least 0.80 and an alpha of 0.05, 21 participants per group were needed. We added to this a 20% allowance for potential dilution due to treatment dropout at the 6-month follow-up. A sample size of 26 participants per group was thus targeted to provide adequate power to test the major hypothesis of the initial investigation.[12] A detailed description of study procedures and treatment protocols can be found in the original article reporting the main results of the randomized trial.[12]

A multistage data analytic strategy[21] was used in the present extension of the original study. Six-month and 2.5-year follow-up data were compared using a repeated measures multivariate analysis of variance (MANOVA) approach, with time as the within-subjects variable and treatment as the between-subjects variable.[22] Outcome measures were clustered per conceptual domain (pain and sexual function). When multivariate results were significant, univariate analyses were conducted. If significant, these were followed by planned contrasts or post hoc comparisons with Bonferroni corrections. Greenhouse-Geisser adjustment was applied to compensate for violations of homogeneity of covariances.[22]

RESULTS

Of the 78 participants who had completed treatment in our original randomized study,[12] 51 took part in the present 2.5-year follow-up: 15 of the 22 women in the vestibulectomy condition, 17 of the 28 in the biofeedback condition, and 19 of the 28 in the cognitive–behavioral therapy condition. Number of dropouts did not differ significantly per treatment condition, χ^2 (2, n=78)=0.42, P=.81. The 27 dropouts were not significantly different from the women who completed previous assessments on any of the sociodemographic or pretreatment dependent variables. In an effort to preserve the comparability of groups allowed by randomization, all dropouts were included in the analyses by using imputations for missing values (last observation carried forward) and reducing the error degrees of freedom by the number of estimated values to minimize the risk of Type I error.[23] The final sample size thus included the 78 participants who completed treatment in our original study. Detailed sociodemographic characteristics of these participants by treatment condition can be found in Table 1.

Seventeen of the 51 participants reported having used other means to alleviate their pain during the course of the follow-up period. Eight tried physical therapy, four tried psychotherapy, and five tried mild remedies (eg, sitz baths, relaxation, massage). Ten of these 17 women felt that the other treatments had helped, although the number of participants having tried to alleviate their pain in other ways did not differ as a function of treatment condition, χ^2 (2, n = 51) = 0.52, P = .77.

The means and standard deviations for the pain and psychosexual functioning measures by treatment condition and time of assessment are shown in Table 2.

Results from the MANOVA conducted on the pain measures indicated a significant time main effect, F(4,72)=3.18, P<.05, and a significant treatment main effect, F(8,146)=3.02, P<.01. Univariate analyses indicated the following: 1) For the vestibular pain index, there was a significant treatment main effect, F(2,75)=8.96, P<.01, indicating that vestibulectomy participants as a whole had significantly lower pain levels than biofeedback participants. Planned comparisons also revealed that they had lower pain levels than group cognitive–behavioral therapy participants, F(2,75)=10.38, P<.01. 2) For the self-reported pain intensity during intercourse, there was a significant time main effect, F(1,75)=8.66, P<.01, showing that participants reported significantly lower levels of pain at the 2.5-year follow-up as compared with the 6-month follow-up and a significant treatment main

Table 1. Sociodemographic Characteristics of the Sample

Variable	Vestibulectomy	Biofeedback	GCBT	Total
Age (y)				
Mean	26.2	27.0	27.1	26.8
Standard deviation	4.8	6.3	5.0	5.4
Pain duration (mo)				
Mean	56.4	63.4	52.3	57.4
Standard deviation	35.9	65.2	41.0	49.5
Education (y)				
Mean	15.5	16.0	16.3	16.0
Standard deviation	3.3	2.0	1.8	2.4
Religion				
Catholic	14	16	17	47
Protestant	1	2	1	4
Jewish	1	0	2	3
Other	0	2	0	2
None	6	8	8	22
Place of birth				
North America	22	25	24	71
Europe	0	3	2	5
Latin/South America	0	0	1	1
Other	0	0	1	1
Marital status				
No partner	5	4	5	14
Dating	5	8	6	19
Living with partner	10	11	12	33
Married	2	5	5	12
Language of interview				
French	18	21	19	58
English	4	7	9	20
Annual income ($)				
0–19,999	8	11	15	34
20,000–39,999	6	3	3	12
40,000–59,999	4	8	4	16
60,000 or more	4	6	6	16
Ever experienced childbirth				
Yes	1	3	1	5
No	21	25	27	73

GCBT, group cognitive–behavioral therapy.

effect, $F(2,75)=3.50$, $P<.05$, indicating that vestibulectomy participants as a whole had significantly lower pain levels than biofeedback participants. Planned comparisons did not reveal any significant difference between vestibulectomy and group cognitive–behavioral therapy participants. 3) For the McGill Pain Questionnaire–Pain Rating Index, there was a significant time main effect, $F(1,75)=3.91$, $P<.05$, showing that participants reported significantly lower levels of pain at the 2.5 year follow-up as compared with the 6-month follow-up and a significant treatment main effect, $F(2,75)=3.34$, $P<.05$, indicating that vestibulectomy participants as a whole had significantly lower pain levels than group cognitive–behavioral therapy participants. Planned comparisons also revealed that they had lower pain levels than biofeedback participants, $F(2,75)=5.17$, $P<.05$. 4) For the Sensory scale of the McGill Pain Questionnaire, there was a significant time main effect, $F(1,75)=6.28$, $P<.01$, showing that participants reported significantly lower levels of pain at the 2.5-year follow-up as compared with the 6-month follow-up and a significant treatment main effect, $F(2,75)=4.17$, $P<.05$, indicating that vestibulectomy participants as a whole had significantly lower pain levels than group cognitive–behavioral therapy participants. Planned comparisons also revealed that they had lower pain levels than biofeedback participants, $F(2,75)=5.24$, $P<.05$.

Results from the MANOVA conducted on sexual function measures did not reveal any main or interaction effects, showing that participants remained unchanged between 6-month and 2.5-year follow-up and that there were no group differences. Analysis by treatment received, involving only the 51 participants

Table 2. 2.5-Year Follow-up: Dependent Measures by Time of Assessment and Treatment Condition

	6-mo Follow-up		2.5-y Follow-up	
Measure and Group	Mean	Standard Deviation	Mean	Standard Deviation
Vestibular pain index				
Vestibulectomy	1.90	2.24	1.58	1.91
Biofeedback	4.42	2.63	4.22	2.54
GCBT	3.89	2.09	3.66	2.33
Pain during intercourse				
Vestibulectomy	3.41	3.17	2.05	1.87
Biofeedback	4.50	2.63	4.29	2.66
GCBT	4.46	2.47	3.30	2.73
MPQ-PRI				
Vestibulectomy	14.27	13.06	7.95	8.95
Biofeedback	20.43	18.10	20.32	18.31
GCBT	20.93	14.18	19.96	15.60
MPQ-Sensory				
Vestibulectomy	9.45	8.19	5.59	6.62
Biofeedback	13.82	10.66	12.54	10.42
GCBT	14.75	8.87	13.82	10.03
Sexual History Form				
Vestibulectomy	0.45	0.15	0.43	0.11
Biofeedback	0.48	0.08	0.48	0.10
GCBT	0.48	0.11	0.46	0.12
Frequency of intercourse				
Vestibulectomy	5.74	5.47	5.08	4.06
Biofeedback	4.04	4.56	4.09	3.16
GCBT	3.92	3.77	4.66	4.02
BSI-GSI				
Vestibulectomy	50.09	10.49	52.82	10.67
Biofeedback	50.79	9.39	50.78	9.52
GCBT	51.79	7.61	51.79	7.13

GCBT, group cognitive–behavioral therapy; MPQ-PRI, McGill Pain Questionnaire–Pain Rating Index; BSI-GSI, Brief Symptom Inventory–Global Severity Index.

who completed the 2.5-year follow-up evaluation, supported the general pattern of results of the above intent-to-treat analysis.

The means and standard deviations for the pretreatment predictor variables by treatment condition are shown in Table 3. Correlations between 2.5-year follow-up pain outcome measures and pretreatment predictor variables were computed for each treatment condition. Because the 2.5-year follow-up vestibular pain index is the outcome measure with which the most pretreatment variables correlated, it was chosen as the outcome criterion. In the vestibulectomy condition, the pretreatment vestibular pain index (pain during the cotton-swab test) and the Sexual Opinion

Table 3. Pretreatment Predictor Variables by Treatment Condition

	Vestibulectomy		Biofeedback		GCBT	
Measure	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Vestibular pain index	6.34	1.85	5.79	1.59	5.45	1.88
Pain during intercourse	7.18	1.62	6.93	1.80	7.14	1.53
MPQ-PRI	26.82	14.68	26.46	15.99	28.93	12.29
MPQ-Sensory	17.86	8.40	17.07	8.34	18.61	7.28
Sexual History Form	0.47	0.11	0.51	0.11	0.51	0.13
Frequency of intercourse	4.61	4.30	3.38	2.91	3.69	3.22
Sexual Opinion Survey	88.32	22.95	86.39	12.19	87.68	18.83
BSI-GSI	53.32	9.62	54.11	8.78	56.36	8.11
Confidence in treatment	8.31	1.49	7.96	1.35	6.68	1.36

GCBT, group cognitive–behavioral therapy; MPQ-PRI, McGill Pain Questionnaire–Pain Rating Index; BSI-GSI, Brief Symptom Inventory–Global Severity Index.

Survey both correlated significantly with the 2.5-year follow-up vestibular pain index, $r=0.58$, $P<.01$; $r=-0.77$, $P<.001$, respectively. In the biofeedback condition, the Pain Rating Index of the McGill Pain Questionnaire, the Brief Symptom Inventory, and the measure of confidence in treatment all correlated significantly with the 2.5-year follow-up vestibular pain index, $r=0.40$, $P<.05$; $r=0.39$, $P<.05$; $r=-0.40$, $P<.05$, respectively. Last, in the cognitive–behavioral therapy condition, the pretreatment vestibular pain index as well as both the Pain Rating Index and the Sensory scale of McGill Pain Questionnaire correlated significantly with the 2.5-year follow-up vestibular pain index, $r=0.49$, $P<.01$, $r=0.49$, $P<.01$, and $r=0.43$, $P<.05$, respectively.

To identify predictors of outcome, three hierarchical regression analyses were conducted using the 2.5-year follow-up vestibular pain index as the dependent variable, as presented in Table 4. The first regression examined the contribution of pretreatment pain and the Sexual Opinion Survey to the prediction of pain at follow-up in the vestibulectomy condition. Pretreatment pain was entered in Step 1 of the analysis and contributed significant variance to the prediction of outcome. The pretreatment Sexual Opinion Survey was entered in Step 2 and also contributed significant unique variance to the prediction of pain at follow-up, over and above pretreatment pain. This measure accounted for 27% of the variance in outcome, independently of that accounted for by pretreatment pain. Together, pretreatment pain and the Sexual Opinion Survey accounted for 57% of the variance in outcome.

The second regression focused on the contribution of the pretreatment McGill Pain Questionnaire–Pain Rating Index, Brief Symptom Inventory–Global Severity Index, and confidence in treatment to the prediction of pain at 2.5-year follow-up in the biofeedback condition. The McGill Pain Questionnaire–Pain Rating Index was entered first and contributed significantly to the prediction of outcome, accounting for 13% of the variance in pain. The Brief Symptom Inventory–a measure of psychological adjustment–was entered second, and confidence in treatment was entered third, but neither contributed significant variance to the prediction of pain.

The third regression involved the cognitive–behavioral therapy condition and the relative contribution of pretreatment pain to its outcome. The three pain variables that were correlated with pain at the 2.5-year follow-up were entered simultaneously in one block. Together they accounted for 28% of the variance in outcome. However, as shown in Table 4, only pretreatment pain during the cotton-swab test (vestibular pain index) contributed significantly to the prediction of pain at follow-up.

As a means to determine whether primary compared with secondary vestibulodynia played a role in treatment outcome, we conducted a three-way MANOVA involving time as the within-subject variables and both treatment and onset (primary compared with secondary) as the between-subjects variable. Results from the MANOVA conducted on pain measures did not reveal any effects of onset (primary compared with secondary), whether alone as a main effect or in interaction with time or treatment condition, showing that whether a woman suffers from primary or secondary vestibulodynia does not influence outcome at the 2.5-year follow-up.

DISCUSSION

Results of the present study demonstrate that treatment gains associated with vestibulectomy, biofeed-

Table 4. Pretreatment Predictors of Pain at the 2.5-Year Follow-up: Hierarchical Regressions

	Variables	Beta	R^2 (Change)	F (Change)	*P*
Regression 1: Vestibulectomy					
1	Pretreatment vestibular pain index	0.12*	0.34	10.19	.005
2	Sexual Opinion Survey	–0.69*	0.27	13.04	.002
Regression 2: Biofeedback					
1	MPQ-PRI	0.31†	0.16	5.00	.034
2	Brief Symptom Inventory	0.24	0.10	3.55	.071
3	Confidence in treatment	–0.19	0.02	0.82	.375
Regression 3: Group cognitive–behavioral therapy					
1	Pretreatment vestibular pain index	0.37*	0.36	4.51	.012
	MPQ-PRI	0.34			
	MPQ–Sensory	0.03			

MPQ, McGill Pain Questionnaire; PRI, Pain Rating Index.
For regressions 1 and 2, the beta weights are from the final regression equation.
* $P<.01$.
† $P<.05$.

back, and cognitive–behavioral therapy for provoked vestibulodynia are maintained at a long-term follow-up, both in terms of pain and sexual functioning. Moreover, poorer outcome of these treatments can be predicted by increased pretreatment pain and erotophobia–the tendency to respond with negative affect to sexual cues.

The finding that treatment gains are not only maintained at the long-term follow-up but that in fact pain is significantly reduced suggests that women continue to benefit from the positive effects of each intervention over time. Whereas the majority of studies focusing on vestibulectomy are uncontrolled, report variable follow-up lengths, and have unclear participant selection criteria (Bergeron S, Pukall CF, Mailloux G. Vulvodynia: Treatment and Quantitative Sensory Testing. In: Baranowski A, Abrams P, Fall M, editors. Urogenital pain in clinical practice. New York (NY): Dekker, in press), the present study is prospective, randomized, and involves a homogeneous sample. It thus yields solid evidence concerning the long-term efficacy of vestibulectomy, in a context where surgical approaches to idiopathic vulvar pain are still controversial. Some clinicians hold reservations about surgery and warn that it should be recommended only after failure of more conservative treatments[24]; others claim that there are few data to justify this cautionary statement.[25] Results of this study contribute further empirical weight to the latter proposition. Additional findings provided by the present research nevertheless suggest that 1) psychosexual treatments may produce equivalent long-term gains with regard to functional outcomes, and 2) some women may benefit less from vestibulectomy.

Although results generally continue to support the superiority of vestibulectomy over the two behavioral interventions, this is not the case for self-reported pain during intercourse, where vestibulectomy is not superior to cognitive–behavioral therapy, suggesting that long-term improvements associated with each treatment are very similar with regard to the most relevant outcome criterion for women with provoked vestibulodynia, that of pain during intercourse. This important finding, coupled with the noninvasiveness and cost-effectiveness of group cognitive–behavioral therapy, would support the integration of this intervention into current algorithms rather than referring to it as simply an adjunct or complementary option.[9]

Further, results show that women who are more erotophobic respond less favorably to vestibulectomy. This corroborates the findings of other studies pointing toward the involvement of psychosocial factors in surgical outcomes.[26] For example, an increasing body of research has demonstrated that the strongest predictors of negative outcomes for spine surgery are psychosocial factors, such as depression and anxiety.[26] It has been shown that women with vestibulodynia are more erotophobic than normal controls,[27] and that erotophobic individuals are more avoidant of sexual activity and communicate less about sexual matters.[17] This unaddressed, generalized avoidance of all things sexual could probably influence negatively the return to a normal sex life after surgery by maintaining pain behaviors and intensity despite changes at the pathophysiologic level, in part by shifting the attentional focus away from sex and more toward pain. Clinically, the questionnaire assessing erotophobia is easy to administer and score. In addition, norms for adult American women are provided, which can guide the clinician in the interpretation of the score. Finally, contrary to what has been found in one previous study,[11] onset of pain being primary or secondary was not predictive of treatment outcome.

The present study has some limitations, notably the absence of more refined measures of pretreatment predictors of outcome focusing on specific cognitive, affective, and biomedical factors. Others include attrition of participants at follow-up and the ensuing need to compensate for missing data by carrying forward values from the last measurement time. Finally, a larger sample size might have facilitated the identification of more predictors of outcome, which could not be detected here due to insufficient power. Other limits of the overall study are mentioned in the original paper.[12]

Nonetheless, the clinical and theoretical implications of the present results are multiple. From a clinical perspective, provoked vestibulodynia patients who are quite negative or avoidant about sex are probably not good candidates for vestibulectomy. Further, as suggested by one previous retrospective study,[28] pretreatment and postsurgical sex therapy sessions could maximize the success of this procedure by helping women break the avoidance pattern surrounding sexuality and develop more positive affective responses toward this aspect of their lives, that is, diminish the degree of erotophobia. Of more theoretical interest, the long-term success of vestibulectomy confirms the importance of a peripheral component in the pathophysiology of provoked vestibulodynia and supports the theory of nociceptor sensitization.[29] However, the relative long-term functional success of cognitive–behavioral therapy, as well as the identification of a psychosexual predictor of treatment outcome, suggests that central factors may also be involved in the experience of chronic, recurrent vulvar

pain. Overall, results support a biopsychosocial conceptualization of pain,[30] which should be reflected in future studies by including a wide range of measures directed at understanding the interdependent roles of biomedical, cognitive, affective, behavioral, and interpersonal determinants of vestibulodynia.

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