

CME

Vulvodynia

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ABSTRACT

Introduction. Vulvodynia is increasingly recognized as a cause of sexual pain.

Aim. The goal of this Continuing Medical Education article was to provide a comprehensive review of vulvodynia including terminology, possible etiologies, and offer treatment options.

Methods. A Medline search was conducted using several terms related to and including the terms vulvodynia, vulvar vestibulitis, vestibulodynia, and pudendal neuralgia.

Results. A thorough review of vulvodynia.

Conclusion. Vulvodynia most likely represents several disorders without an identifiable cause in many cases. The management of these patients requires a sensitive provider who can coordinate a multidisciplinary approach to their care. Despite the lack of large-scale, placebo-controlled trials, several new treatment options exist. **Goldstein AT, and Burrows L. Vulvodynia. J Sex Med 2008;5:5–15.**

Key Words. Vulvodynia; Sexual Pain; Etiology

Introduction

In 2003, the International Society for the Study of Vulvovaginal Disease (ISSVD) issued a new terminology for vulvar pain disorders and defined vulvodynia as “vulvar discomfort, most often described as burning pain, occurring in the absence of relevant visible findings or a specific, clinically identifiable, neurologic disorder” [1]. This classification acknowledges that vulvar pain may be attributable to other diagnosable and treatable disorders such as infections, dermatologic disorders, neoplastic processes, and neurologic disorders. However, these definable causes of vulvar pain are not defined as vulvodynia.

Terminology

Vulvodynia is often described as discomfort or burning pain in the vulvar area, occurring in the

absence of visible pathology or a specific, clinically identifiable disorder. The ISSVD has classified vulvodynia into generalized and localized pain. These two categories are further subdivided to provoked and unprovoked pain. Lastly, there is a category for pain that is both provoked and unprovoked (mixed) [1].

Vestibulodynia, a type of vulvodynia that is localized only to the vulvar vestibule, is classified as primary or secondary. In the primary subset, the pain has been present since the first tampon use or intercourse, and with secondary vestibulodynia, women have had painless tampon insertion or intercourse, with the subsequent development of vestibular pain. Vestibulodynia was formerly called “vulvar vestibulitis.” The suffix “-itis” was excluded from the recent ISSVD terminology because it may be misleading, as some studies have found a lack of association between excised tissue and inflammation [2]. Despite the change in

terminology, other studies have shown a marked inflammatory response. As vestibulodynia most likely represents several different disease entities, it is likely that some are, some of these may be inflammatory [3].

Epidemiology

Until recently, there was little known about the epidemiology of vulvodynia. The estimated prevalence of this disorder had ranged from as low as a total of 200,000 women in the United States to as high as 15% of all women, based on a report from a general gynecologic practice population [4]. A study from 1998 reported that 1.3% of women in a genitourinary medicine clinic population had vulvodynia [5]. In 2002, a sample of women was invited to participate in a web-based survey, and 94.5% responded. A history of pain at the vulvar vestibule was reported by 28%, with 7.8% reporting pain within the past 6 months, 3% reporting pain that lasted three or more months, and 1.7% reporting vestibular pain lasting three or more months that occurred within the past 6 months [6].

Women with vestibulodynia have classically been characterized as white, young (mean age 32 years), and nulliparous. In 2003, in a landmark study, Harlow and Stewart estimated the prevalence of chronic unexplained vulvar pain in an ethnically diverse population-based sample of 4,915 women [7]. Approximately 16% reported chronic burning, knife-like pain, or pain on vulvar contact that lasted for at least 3 months or longer. Chronic vulvar pain on contact decreased with increasing age, but the incidence of chronic burning and knife-like pain was similar across all ages. Contrary to earlier assessments, Caucasian and African-American women reported a similar lifetime prevalence. However, Hispanic women were 80% more likely to experience chronic vulvar pain than their Caucasian and African-American counterparts. The authors concluded that as many as 14 million women in the United States may experience chronic vulvar pain during their lifetime. Thus, even if only a small percentage of these women have true vulvodynia, the number of women with the problem is enormous. Unfortunately, at least 30% will suffer without seeking medical care [7].

Etiology

The etiology of vulvodynia remains elusive, but it most likely occurs from a variety of sources and represents many different disease processes. Possible causes include abnormalities of embryologic development, as recent research indicates that primary vestibulodynia is due to a defect in the primitive urogenital sinus and may be thought of as a congenital disorder [8]. Other data have implicated genetic and/or immunologic factors, as Witkin and colleagues have demonstrated polymorphisms in genes coding for Mannose-binding lectin, Interleukin-1 beta, and interleukin-1 receptor antagonists in women with vestibulodynia [9–11]. In addition, there is also an increasing interest in hormonal factors as there is strong evidence that oral contraceptive pill use strongly increases the risk of developing vestibulodynia [12]. It is also likely that there is both a peripheral and central neuropathic process in some women with vestibulodynia. Bohm-Starke et al., Bornstein et al., and Westrom and Willen have shown an increased density of C-afferent nociceptors in the vestibular mucosa of women with vestibulodynia [13–15]. Bornstein and colleagues [14] have also shown a marked increase in mast cells in the vestibular mucosa of women with vestibulodynia. They have postulated that activated mast cells release nerve growth factor, which leads to the proliferation of nociceptors [14]. It is likely that the increased density of nociceptors is at least partially responsible for the extreme allodynia of vestibulodynia. However, this increase in nociceptive pain does not completely account for all of the symptoms of vulvodynia, as Pukall et al. found that patients with vestibulodynia have a systemic (i.e., nonlocalized) hypersensitivity to tactile and pain stimuli [16]. This suggests that some of the symptoms of vulvodynia are a manifestation of a central neuropathic pain process. Lastly, other data have implicated allergic reactions [14,17], myofascial hypertonicity [18], and nerve entrapment or injury as potential causes of vulvar pain [19]. In essence, it is likely that there are many different diseases that yield similar symptoms and cause vulvodynia.

In the past decade, many of the earlier theories regarding the etiology of vulvodynia have been called into question. Data regarding the role of human papilloma virus in vulvodynia are frequently contradictory; while the majority of recent studies do not show an association, particularly in

pain that is localized to the vulvar vestibule, other studies still suggest that one exists [19–21]. In addition, the early hypothesis of increased urinary oxalate has also been refuted [22,23]. Lastly, despite the fact that many women with vulvodynia report a past history of candidiasis, its role as a causative agent of vulvodynia is also uncertain largely because the inaccuracy of self-diagnosis of candidiasis [24].

A few clinicians believe that vulvodynia occurs directly as a result of psychological or sexual dysfunction. This viewpoint, however, is rejected by most patients and by the majority of the clinicians who treat these patients. However, almost all agree that the presence of chronic pain, such as with vulvodynia, can have profound psychosocial ramifications.

In 2003, thought leaders at a National Institute of Health-sponsored conference on vulvodynia concluded that generalized, non-provoked vulvodynia is described most accurately when it is thought of as a complex regional pain syndrome (CRPS), similar to other CRPS such as fibromyalgia and interstitial cystitis [25]. Like women with other CRPS, women with vulvodynia exhibit enhanced systemic pain perception, a process known as central nervous system sensitization [26]. Second, women with vulvodynia are more likely to have other CRPS such as interstitial cystitis [27]. This may be explained by another phenomenon common to CRPS known as “wind-up” in which there is progressively increasing activity in dorsal horn cells of the spinal cord following repetitive activation of primary afferent C-fibers.

Physical Examination

All women with vulvar pain should have a thorough physical examination. The goal of this exam is to find evidence of an identifiable disease, which can cause vulvovaginal pain but would not be classified as vulvodynia. The vulva should be examined for evidence of infection, trauma, or dermatitis. Specifically, the observer should note any inflammation, induration, excoriation, fissures, ulceration, lichenification, hypopigmentation, hyperpigmentation, scarring, or architectural changes of the vulva. The authors find that using a colposcope can greatly enhance the visual inspection of the vulva. Although a discussion of vulvovaginal dermatologic diseases is beyond the scope of this article, we suggest that any abnor-

malities found on visual examination of the vulva should be biopsied, and the tissue sent to a dermatopathologist. However, we caution against biopsies of the vulvar vestibule when the only physical finding is erythema, as the results of these biopsies are almost always nondiagnostic.

After the visual exam has been completed, a sensory exam should be completed. A moistened cotton swab should be used to palpate the labia majora, intralabial sulcus, perineum, prepuce, labia minora, clitoris, and vulvar vestibule. Particular attention should be paid to the tissue immediately lateral and medial to Hart’s line on the labia minora. Frequently, there will be normal sensation lateral to Hart’s line and extreme allodynia medial to this anatomic boundary. This finding establishes the diagnosis of vestibulodynia. The vestibule should then be gently palpated in seven locations: anterior and inferior to the urethra, laterally to the urethra on both sides, and in the posterior vestibule at the 4, 6, and 8 o’clock positions. (The authors would like to suggest that allodynia and hyperpathia throughout the entire vestibule indicate that there is an intrinsic pathology in the tissue of the vulvar vestibule such as atrophy or neuronal proliferation. However, when there is pain only in the posterior vestibule, this frequently indicates that the vestibular pain is caused by hypertonus of the levator ani muscles.) An instrument called a vulvagesiometer can be used to quantify the amount of pressure needed to elicit a pain response. Lastly, if there are symptoms of generalized burning or rawness which may suggest a neuropathic disorder, a more thorough neurologic exam is warranted.

The vagina should then be examined by inserting a pediatric-sized speculum. The speculum should be inserted through the hymen without touching the vestibule to avoid causing the patient pain. The vaginal mucosa should be examined for loss of rugae and erythema, which is suggestive of atrophy. Additionally, erosions, ulcerations, or synechiae could indicate erosive lichen planus. Discharge should be obtained for a wet mount and culture to rule infectious or inflammatory vaginitis.

A digital exam is then performed using only one finger. The finger is gently inserted through the hymen. The levator ani muscles are palpated for evidence of pain, hypertonus, or trigger points indicating pelvic floor dysfunction. The urethra and bladder are then palpated; tenderness can be

evidence of interstitial cystitis. The uterus, adnexa, and rectovaginal septum are then palpated to look for evidence of masses, scarring, or endometriosis. Lastly, the pudendal nerves are palpated at the ischial spines as tenderness can be a sign of pudendal neuropathy or pudendal nerve entrapment.

Treatment

Common recommendations for minimizing irritation include the use of 100% cotton underwear and not wearing underwear at night while sleeping. In our practice, we counsel patients to avoid vulvar irritants and douching, and to use mild soap for bathing without applying soaps to the vulva. We recommend against using face cloths for washing; the interlabial sulci and vestibule can be cleaned easily with water and gentle touch. We have found that daily use of pantyliners can be especially irritating and discourage their use; we recommend unscented, undyed, cotton menstrual pads during menstruation.

Inadequate lubrication during intercourse can greatly exacerbate vulvar discomfort. Many different lubricants exist in a variety of bases. We have found that Slippery Stuff (Wallace-O'Farrell Inc, Puyallup, WA, USA) is well tolerated because it does not contain propylene glycol, which can act as an allergen or irritant. Some patients find natural oils (olive, tea tree, sweet almond, sesame, rosehip, grape seed, and wheat germ) to be efficacious.

Ice packs, cool gel packs, or other forms of cold application are helpful in some patients, but they may produce irritation when overused. Rinsing the vulva after urination may be helpful in some cases. The area should then be gently patted dry. After bathing in a tub or shower, we advise patients to pat dry the genital area. If the skin is dry, emollients (plain petrolatum) may be used topically to hold moisture and improve the barrier function.

Topical Treatments

Some patients find relief from vulvodynia with topical anesthetics. All topical anesthetics may cause initial burning and stinging upon application; the discomfort lasts for a few minutes until the area is numb. The longer the ointment is on the area, the deeper the anesthesia.

The most commonly prescribed topical medication is lidocaine (Xylocaine; AstraZeneca Pharmaceuticals, Wilmington, DE, USA) jelly 2% or

ointment 5%. This can be applied as often as required for symptomatic relief, and 30 minutes before sexual activity for those women with dyspareunia. EMLA (eutectic mixture of local anesthesia, comprising lidocaine and prilocaine; AstraZeneca Pharmaceuticals) and LMX 4, LMX 5 (Ferndale Laboratories, Ferndak, MI, USA) (lidocaine 4% and 5%) are also used by some patients. Rarely, the sexual partner experiences numbness as well. When a topical anesthetic is used, the sexual partner should avoid oral contact [2].

The long-term use of overnight topical lidocaine has been proposed as a specific therapy for vulvodynia. The authors theorized that the regular application of lidocaine to interrupt the painful impulses may minimize feedback amplification of pain and allow for healing. The use of overnight lidocaine has been studied in an open-label trial by Zolnoun and colleagues [28]. Patients were instructed to apply a copious amount of 5% unbuffered lidocaine ointment to a cotton ball to be placed on the vestibule at bedtime to assure continuing overnight application. Patients were instructed to use the treatment nightly, for eight or more hours every night. Of 61 women with vestibulodynia, 76% were able to have intercourse after therapy as compared with 36% at baseline, and there was a significant decrease in pain with sexual activity. Unfortunately, a long-term follow-up is not available for this study.

Benzocaine, which is the anesthetic in Vagicare (Clay-Park Laboratories Inc, Bronx, NY, USA) and Vagisil (Combe Inc, White Plains, NY, USA), is a sensitizer and is a common cause of allergic contact dermatitis; thus, we do not recommend their use in patients with vulvodynia. Similarly, diphenhydramine (Benadryl; Warner Welcome, Morris Plains, NJ, USA) is in many topical anesthetic and anti-itch preparations, and is another common sensitizer to be avoided. Some patients benefit symptomatically from the application of plain petrolatum (Vaseline; Cheeseborough-Ponds, Greenwich, CT, USA) or zinc oxide, perhaps because these agents minimize friction or prevent urine from touching the vestibule.

Topical medications that have been used include estradiol [29], capsaicin [30], atropine, testosterone, nitroglycerine [31], doxepin, amitriptyline, baclofen, and gabapentin [32]. Unfortunately, there are few adequate trials assessing the efficacy or safety of these medications in women with vul-

vodynia. Although not supported by controlled trials, the authors have found that for women who have developed vestibulodynia while on oral contraceptives, a compound of topical estradiol 0.03% and testosterone 0.1% can be very effective.

Topical therapies that patients describe as *not* having significant benefit for vulvodynia are important to note in order to avoid side effects and symptom exacerbation. Although topical corticosteroids logically should improve the pain of vestibulodynia, they generally do not. In addition, the use of chronic topical corticosteroids on the vulva may produce dermal atrophy or a steroid dermatitis, characterized by erythema and burning. Topical antifungals are often used empirically by many clinicians because early theories as to the cause of vulvodynia included hypersensitivity to *Candida* species. However, topical antifungal therapy generally does not improve vulvodynia. To the extent that these preparations provide some relief, it is most likely due to the soothing properties in the vehicle itself. Furthermore, these topical preparations may cause a superimposed irritant or allergic vulvovaginitis.

Oral Treatment

Antidepressants are commonly used in the treatment of many chronic pain conditions. A common treatment for vulvodynia is the use of oral tricyclic antidepressants such as amitriptyline (Elavil; AstraZeneca Pharmaceuticals), nortriptyline (Pamelor; Novartis Pharmaceuticals, East Hanover, NJ, USA), and desipramine (Norpramin; Aventis Pharmaceuticals, Bridgewater, NJ, USA). The mechanism of action is believed to be associated with blocking reuptake of norepinephrine and serotonin transmitters, although the mechanism may actually be attributable to the anticholinergic effects [32].

Tricyclic antidepressants have been used to treat many pain conditions, which are thought to have a neuropathic etiology. While traditionally these medications have been used for generalized vulvodynia, they are also useful in the treatment of localized pain. A 47% complete response to tricyclic antidepressants for the use of vulvodynia (both generalized and localized) was reported in 33 women attending a vulvodynia clinic. However, this was not a randomized study, and other interventions may have contributed to successful treatment such as support and counseling [32].

Should a patient choose tricyclic antidepressants as a treatment for vulvodynia, it is important for the clinician to emphasize that their effect is for pain rather than depression. Facilitating the patient's understanding of her treatment ideally will enhance patient compliance.

Patients on tricyclic antidepressants should not be pregnant, intend to become pregnant, or breast-feed while using these medications. Appropriate contraception should be initiated (or continued) for patients of reproductive age if they are sexually active. It is important to remember that these medicines will exacerbate the effects of alcohol and other central nervous system depressants. Patients should avoid more than one drink of alcohol daily while taking these medications. Patients with a history of cardiac disease should have a screening electrocardiogram before starting tricyclic antidepressants.

The dosages of tricyclic antidepressants used for vulvodynia are significantly less than those used for depression. Amitriptyline is often used as a first-line agent, although many health care providers prefer nortriptyline and desipramine, as they tend to have fewer side effects than amitriptyline (which include dry mouth, drowsiness, and constipation). All are dosed in a similar fashion. We recommend starting patients at a low dose, and increasing the dosage slowly until a nightly dose is reached that relieves symptoms. Patients should take this medication approximately 2 hours before bedtime. An appropriate starting dose is 5–25 mg nightly (use 5–10 mg for elderly patients), and it is increased by 10–25 mg weekly, not to exceed 150 mg nightly. Tricyclics are available in elixir formulations so that very small doses can be used to start patients who are sensitive to these medications.

Should patients elect to discontinue these medications, they should be weaned gradually and warned against stopping them too suddenly. This class of medications should not be used in patients with abnormal heart rates (tachycardia) or in patients taking monoamine oxidase inhibitors.

Other antidepressants have been used for pain control. Many providers have prescribed selective serotonin reuptake inhibitors for women with vulvodynia, but in general, this class has not been shown to be effective for pain relief in the majority of women. However, a newer class of medications, the selective norepinephrine reuptake inhibitors have been more effective in treating vulvodynia. These include venlafaxine (Effexor XR; Wyeth

Pharmaceuticals, Madison, NJ, USA) and duloxetine (Cymbalta; Eli Lilly and Company, Indianapolis, IN, USA) [2]. Venlafaxine is started at 37.5 mg daily, and can be increased up to 225 mg daily. With all of the antidepressants discussed, adequate time for a treatment trial must be given prior to abandoning them, as long as the side effects are tolerable. Often, full pain relief response is not seen until four or more weeks of antidepressant use. Cymbalta is Food and Drug Agency approved for both diabetic peripheral neuropathic pain and major depression. It is started at 30 mg daily, and increased to 60 mg per day after 1 week. Side effects include nausea, dizziness, somnolence, and fatigue. When discontinuing this medication, tapering is recommended.

Gabapentin (Neurontin; Pfizer Inc, New York, NY, USA) and carbamazepine (Tegretol; Novartis Pharmaceuticals, East Hanover, NJ, USA) have been used to treat chronic pain conditions including vulvodynia [33]. Gabapentin comes in 100-, 300-, 400-, 600-, and 800-mg tablets. Generally, it is started at 300 mg daily for 3 days, then 300 mg twice daily for 3 days, then 300 mg three times daily. It can gradually be increased to 3,600 mg total daily dose. Ideally, gabapentin is given in a three-time-a-day dose; however, if the patient is unable to comply with that, it can be given in a bid dose. Gabapentin tends to have fewer side effects than the tricyclic antidepressants. The adverse effects of gabapentin include somnolence, dizziness, and less commonly, gastrointestinal symptoms and mild peripheral edema. Monitoring and dosage adjustment are required for these side effects, but usually, the drug does not need to be discontinued. In the elderly, gabapentin may cause or exacerbate gait and balance problems as well as cognitive impairment. For those with renal impairment, dose adjustment is necessary. As with tricyclic antidepressants, gabapentin takes time to achieve adequate pain control. We suggest 3–8 weeks for titration to allow for the development of tolerance to adverse effects. Once the maximum tolerated dosage is reached, allow 1–2 weeks of medication prior to giving a final assessment of pain improvement.

Biofeedback and Physical Therapy

Biofeedback and physical therapy are commonly employed in the treatment of vulvodynia, for both local and generalized pain. Physical therapy is

effective in lowering levator ani hypertonus, in normalizing and facilitating normal muscle tone, increasing pelvic floor strength, desensitizing local tissues, and improving vulvovaginal elasticity. Biofeedback aids in developing self-regulation strategies for coping with and reducing pain as well as facilitating normal muscle tone and to promote muscle stability. Patients with vestibular pain in general have an increased resting tone and a decreased contraction tone of the pelvic floor muscles. With the aid of a biofeedback machine, an individual can view a display of numbers on a meter, or colored lights to assess muscle tension. In this way, it is possible to develop voluntary control over those biological systems involved in pain, discomfort, and disease. The time required for biofeedback and the frequencies of visits will vary with each person. Success rates in the 60–80% range have been reported [34].

Physical therapists with experience in vulvodynia can be helpful. They frequently do a thorough evaluation and assessment of pelvic muscle tone, posture, mobility, and muscle strength [35]. Then, specific exercises can be prescribed, often with good results. Given that pain can be referred to other parts of the body, such as the back and hips, thus, a thorough musculoskeletal evaluation should be performed. When assessing women with vulvodynia from a physical therapists' perspective, practitioners many times find abnormally high muscle tone (or spasm), poor contraction/relaxation cycles, and instability within the muscular structure of the pelvic floor. Hartmann and Nelson [36] retrospectively studied a group of women with chronic vulvar pain, who were treated with physical therapy. Seventy-one percent showed a greater than 50% improvement in overall symptom reduction, while 62% reported an improvement in sexual functioning, and 50% reported improvement in quality of life issues [36]. Bergeron and colleagues questioned 35 women who had undergone physical therapy and found that 71% of those treated experienced complete, great, or moderate improvement [37]. They also showed an increase in intercourse frequency as well as a decrease in pain with intercourse and with the gynecologic examination. In this cohort, physical therapy treatment included internal (vaginal and rectal) and external soft tissue mobilization and myofascial release; trigger-point pressure; visceral, urogenital and joint manipulation; electrical stimulation; therapeutic exercises; active

pelvic floor retraining; biofeedback; bladder and bowel retraining; instruction in dietary revisions; therapeutic ultrasound; and home vaginal dilation.

Intralesional Injections

While topical steroids generally do not improve patients with vulvodynia, occasionally, a trigger-point injection may be of benefit. Trigger-point steroid and bupivacaine injections have been successful for some patients with localized vulvodynia. It is recommended that not over 40 mg of triamcinolone acetonide be injected monthly. The steroid may be combined with bupivacaine (large area, use 0.25% bupivacaine; small area, use 0.5% bupivacaine). It is important to draw up the triamcinolone acetonide prior to the bupivacaine to prevent contamination of the triamcinolone. The combined medications may be injected into a specific area or used as a pudendal block. Patients typically do not tolerate more than three or four injections. Other regimens include submucosal methylprednisolone and lidocaine [38].

Interferon-alpha, a naturally occurring protein produced by leukocytes, improves the immunologic function, decreases inflammation, and inhibits mast cells. In a study by Goldstein et al. [2], 214 patients treated with a series of 12 intravestibular injections of 1.5 million units of interferon-alpha showed an overall 42% improvement. Patients were more likely to have success if they had secondary vestibulodynia for less than 2 years. Interestingly, very few patients with primary vestibulodynia were improved [2].

Recently, the use of botulinum toxin A (Botox; Allergan Inc, Irvine, CA, USA) has been successfully used for the treatment of vulvodynia [39]. Small clinical trials have shown significant reduction in pain scores in women with vulvodynia after intralevator injections of botulinum toxin A. It is not known if the decreased pain is a result of botulinum toxin A's ability to block nociception or in its ability to decrease levator ani spasm. In the author's experience, because of the high cost of botulinum toxin A, it should be used only to augment pelvic floor physical therapy in women with recalcitrant levator ani hypertonicity.

Surgical Treatment

For patients who have exhausted the other treatment options and have still not achieved adequate

relief of their pain, surgical management should be considered. Patients should be counseled ideally with a family member or a significant other present. The procedure should be explained in an understandable way, and any potential complications that may occur should be disclosed. Postoperative instructions should be reviewed in advance on at least one occasion, and they should be provided in written form. It should be emphasized to the patient that her recovery will take several weeks, and that she should not expect an "immediate" cure. In our experience, under the best of circumstances, patients are ready to begin therapy with vaginal dilators at 6 weeks postoperatively, and may attempt sexual activity by approximately 4 months.

Prior to surgery, it is important to evaluate the patient for levator ani spasm (pelvic floor dysfunction), which may occur in 50–60% of patients with vestibulodynia. If levator ani spasm is present, this should be treated prior to surgery because surgery is less successful in this subgroup of patients [2]. Vaginal dilators, as well as various forms of physical therapy, are beneficial for levator ani spasm. Additionally, counseling may enhance postoperative improvement by reducing pelvic floor hypertonicity and poor sexual arousal, which can develop after long-standing dyspareunia.

When Woodruff and Poliakoff first described surgery for vestibulodynia in 1981, he called it a "modified perineoplasty" [40]. Since that time, there have been 32 different case series comprising a total of 1,275 patients [41]. These reports represent several different surgical procedures as there have been modifications of the basic excision and reconstructive procedure. In the original procedure, Woodruff and Poliakoff removed a semi-circular 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 vestibulodynia, 28 of the 32 articles demonstrate at least an 80% success rate with surgical management of vestibulodynia [42]. A recent series of 104 women who underwent vulvar vestibulectomy demonstrated that 93% were satisfied with the procedure and would recommend the procedure to other women with similar symptoms [41]. However, despite the high success rates of vestibulectomy, many authors believe that surgery

should be reserved for women with long-standing and severe localized vestibular pain when other conservative treatments have provided inadequate pain relief. Although there are no controlled trials, the authors believe that primary vestibulodynia almost always requires vestibulectomy.

Vulvar Vestibulectomy

A vestibulectomy may be performed under spinal or general anesthesia. Specifically, the entire vulvar vestibule is outlined and then infiltrated with marcaine 0.5% with epinephrine for intraoperative hemostasis and postoperative pain control [42]. The mucosa of the anterior vestibule is excised even when this area is not painful because this lowers the chance of postoperative symptom recurrence. The mucosa of the entire vestibule is then excised to a point 3 mm past the hymenal ring, thereby removing the entire hymen. The vaginal mucosa is then separated off the recto-vaginal fascia to create a vaginal advancement flap. 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 sutures of 3-0 vicryl. These mattress sutures are positioned in an anterior-posterior direction so that the diameter of the vagina is not compromised. Furthermore, these sutures 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 sutures of 4-0 vicryl. Using interrupted sutures minimizes the risks of hematoma, wound dehiscence, and postoperative scarring [42].

In the study by Goldstein et al. [41], 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 (The Glass Menagerie, Inc., Westbrookville, NY, USA).

Complications from vestibulectomies are infrequent and usually minor, but may include clinically relevant blood loss (<1%), wound infection or separation (1–3%), granulation tissue (1–3%), decreased orgasm (8%), Bartholin's duct cyst formation (1–3%), unfavorable cosmetic changes (4%), decreased lubrication (20%), and continued significant dyspareunia (12%) [41].

Psychological Effects of Vulvodynia

The psychological impact of chronic pain is well documented; feelings of hopelessness, depression, and anxiety are common [43–45]. These feelings are compounded in sexual pain disorders such as provoked vestibulodynia, and even when vulvar pain resolves, the psychological and sexual dysfunction often persist. Therefore, in addition to treating the biologic process of vulvar pain, it is imperative to address any associated psychosexual and relationship dysfunction. In addition, it has been shown that cognitive-behavioral therapy and hypnosis by themselves can be effective treatments for vulvodynia [46–48]. While a thorough discussion of all the psychosocial ramifications of chronic vulvar pain is beyond the scope of this article, the authors have found that it is essential to have a multidisciplinary team involving physicians, physical therapists, sexual therapists, psychologists, and couple therapists to adequately treat the psychosocial aspects of vulvar pain.

Conclusion

The treatment of vulvodynia is confounded by the fact that it most likely represents several different disease entities with significantly different etiologies. Therefore, the treatment of all patients with vulvodynia includes a comprehensive, systematic approach that not only employs various treatment options for the biological process of vulvodynia, but also addresses the psychosocial and sexual aspects of the disease with compassion.

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CME Questions

- Which of the following is not currently accepted as a possible cause of vulvodynia?
 - Injury to the pudendal nerve
 - Increased density of nociceptors
 - Polymorphism in the gene for insulin-like growth factor
 - Congenital defect
 - Abnormal response to oral contraceptive pills
- Which of the following oral medication is most useful for the treatment of vulvodynia?
 - misoprostol
 - metformin
 - citalopram
 - sertraline
 - desipramine
- Which of the following topical medications *is not* useful for the treatment of vulvodynia?
 - clobetasol
 - lidocaine
 - capsaicin
 - gabapentin
 - estradiol
- Which of the follow alternative treatments *has not* been studied for the treatment of vulvodynia?
 - Cognitive behavior therapy
 - Transcendental meditation
 - Acupuncture
 - Physical therapy
 - Hypnosis
- Which of the following is not a correct statement?
 - Up to 30% of women with vulvodynia do not seek treatment
 - Biofeedback, physical therapy, and botulinum toxin A may be useful to treat hypertonicity of the pelvic floor muscles
 - Vulvodynia is primarily a psychological condition resulting from sexual abuse
 - The most studies of vulvar vestibulectomy have demonstrated at least 80% success rate
 - Generalized, non-provoked vulvodynia is similar to other complex regional pain syndromes such as interstitial cystitis and fibromyalgia

Overall evaluation of the activity

- Excellent
- Very good
- Good
- Fair
- Poor

Was this activity responsive to your needs?

- Yes
No

Was this activity relevant to your practice?

- Yes
No

Did this activity increase your knowledge and/or skills in delivering patient care?

- Yes
No

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