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CLINICAL OPINION

Understanding and treating vaginismus: a multimodal approach

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Abstract
Introduction and hypothesis This clinical opinion was written to bring attention to the understanding and treatment of vaginismus, a condition that is often under diagnosed and therefore inadequately treated, yet affects millions of women worldwide. Despite its description more than a century ago, vaginismus is rarely taught in medical school, residency training, and medical meetings. The DSM 5 classification stresses that vaginismus is a penetration disorder in that any form of vaginal penetration such as tampons, finger, vaginal dilators, gynecological examinations, and intercourse is often painful or impossible. Compared with other sexual pain disorders such as vulvodynia and vestibulodynia, the treatment of vaginismus has the potential for a high rate of success. Stratifying the severity of vaginismus allows the clinician to choose among numerous treatment options and to better understand what the patient is experiencing. Vaginismus is both a physical and an emotional disorder. In the more severe cases of vaginismus women (and men) complain that attempted intercourse is like "hitting a wall" suggestive of spasm at the level of the introitus. The emotional fallout resulting from this needs to be addressed in any form of treatment applied.
Methods This article is based on lessons learned in the treatment of more than 250 patients and evaluation of more than 400 inquiries, and was written to make vaginismus more widely understood, to aid in the differential diagnosis of sexual pain, suggest a variety of effective treatments, and explain how Botox can be used as part of a multimodal treatment program to treat vaginismus.
Conclusions With greater awareness among clinicians it is hoped that medical schools, residency programs, and medical meetings will begin teaching the understanding and treatment of vaginismus.

Keywords Vaginismus · Painful sex · Painful intercourse · Unable to have intercourse · Unable to consummate

Introduction

Vaginismus is currently defined by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM 5) as a "Genito-Pelvic Pain/Penetration Disorder" [1]. Basson et al. note the inability of a woman to achieve vaginal penetration despite a desire to do so [2]. This results in sexual and non-sexual (gynecological examination, tampon, dilators) aversion to vaginal penetration owing to actual or anticipated pain [3]. Women with primary (lifelong) vaginismus have never had pain-free intercourse, whereas those with secondary vaginismus were comfortable with intercourse at some time in their lives and then progressed to painful intercourse [4]. Dyspareunia and vaginismus appear to be part of the spectrum of painful intercourse, the difference being a matter of severity [4, 5]. Situational vaginismus refers to an inability to tolerate certain forms of penetration such as intercourse, yet insertion of tampons or finger penetration is possible. Spasmodic vaginismus [6, 7] denotes spasm of the vagina. Some of our patients have noted that they are able to feel a part of the vagina going into spasm as the result of kissing or foreplay, similar to a person feeling their bladder going into spasm. "Complete vaginismus" refers to an inability to tolerate any vaginal penetration and is commonly seen in the more severe forms of vaginismus [4, 5] accompanied by considerable fear and anxiety. Although vaginismus was described by Sims [7]

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as a case report in 1861, little to no teaching is done in medical schools, residencies, and medical meetings.

This clinical opinion was written to bring attention to understanding and treating vaginismus. based on more than 400 patient evaluations and more than 250 outcomes of treatment since 2005 in a private plastic surgery practice.

Etiology and incidence of vaginismus

The etiology of vaginismus is unknown, although there may be a correlation with sexual molestation, strict sexual or religious upbringing, waiting until marriage to have intercourse, fear of first-time sex (pain, bleeding, tearing, ripping, penis too large, vagina too small, sexually transmitted diseases, fear of pregnancy) and fear of gynecological examinations [9, 10]. In evaluating the histories of our patients, primary vaginismus patients tend to have more positive scores for the above than secondary vaginismus patients who had had normal intercourse for a period of time. Undesirable penetration while being restrained at a young age such as urinary catheterization, enemas, and stretching a vagina "that appeared too small" may set the stage for later vaginismus, as noted by some of our patients. Further noted by some is a family history of vaginismus, which may suggest a maternal influence involving grandmothers, mothers, twins, and sisters; yet, one twin may have vaginismus while the other does not. The influence of merely hearing about these difficulties may manifest as a subsequent fear of penetration. We have conversely noted that a patient may have severe vaginismus and have a negative history for the above.

Women tend to remain silent about their vaginismus, not discussing this with family or friends and often not even with their own doctor [11]. For this reason, the true incidence of vaginismus is unknown, although it is thought to affect 5–17 % of women in a clinical setting [12]

Diagnosis and evaluation of vaginismus

History

The diagnosis of vaginismus is facilitated by using a carefully constructed medical and psycho-sexual history (see ESM) and the Female Sexual Function Index (FSFI) [13]. Alternatively, the Vaginal Penetration Cognition Questionnaire (VPCQ), can be used [14]. Medical reasons for sexual pain such as herpes virus, lichen sclerosis, and others need to be ruled out as a source of sexual pain, as well as a consideration of vulvodynia and vestibulodynia [15].

The history seeks to clarify a patient's penetration history, the amount of pain, and separately the amount of anxiety, with various types of penetration scored 1–10, 10 being the worst possible pain or anxiety. Pain and anxiety are scored by the patient for tampons, cotton tipped applicators, fingers, gynecological examinations, dilators, and intercourse. Recording the amount of pain and anxiety with various forms of vaginal penetration has been helpful in understanding a patient's perception of penetration pain. We have noted that patients who are able to tolerate some forms of penetration and who have lower pain and anxiety scores tend to be easier to treat in that they are able to cooperate with the proposed treatment. The diagnosis of vaginismus is made by a history of severe pain during intercourse or intercourse being impossible. A history of intercourse feeling like "Hitting a brick wall" or "There is no hole down there" is suggestive of vaginal spasm of the introitus [5, 11] and is often diagnostic of severe vaginismus and an important differentiation from dyspareunia, vulvodynia, and vestibulodynia. This history and the inability to tolerate a gynecological examinations are two important diagnostic features of severe vaginismus. Patients with vaginismus may have an aversion to pelvic touch related to the fear of pain and behavioral avoidance [15] and may not permit pelvic examination, cotton-tipped testing, and EMG evaluation. We have found that patients who score themselves as "10's" across the columns (severe pain and severe anxiety) with all forms of penetration have much more difficulty incorporating the suggestion of therapy. Anal intercourse appears to be rare in an evaluation of over 400 questionnaires.

Examination

We have found that a thorough gynecological examination is usually possible in the less severe forms of vaginismus using little to no sedation, whereas women with severe vaginismus may be impossible to examine [7]. As Sims said:

> The most interesting point in the account of the woman was the fact that although she was married for a quarter of a century, she was still a virgin. In my examination about this phenomenon, vaginal examination utterly failed…Even my very slight touch to the vaginal entrance was causing an intensive reaction. The neural system was in chaos, there was this general muscle tension. Her whole body was turning rigid intermittently and trembling. She was screaming and her eyes were glowing like mad. While tear drops were gliding down her cheeks, this situation that resembled terror and death agony was very pitiful. Despite the reflection of all of her physical pain, she was strong, staying on the examination couch, she was begging for me to go on if there was hope for her desperate condition. With all my strength, after a few minutes of thrusting, I was able to put my finger into her vagina for a few seconds, but it did not go further. There was great resistance in the vagina and a rigid contraction that lessened the sensitivity of my finger. Thus, through this examination, I

realized that there was this hard-to-overcome contraction at the entrance of the vagina [7].

Less severe vaginismus patients may show no identifiable vaginal spasm. We have observed that when more severe vaginismus patients are examined the entry to the vagina at the level of the introitus is usually noted to be in spasm and looks and feels like a tightly closed fist, making penetration with a finger or speculum impossible. These patients usually require some sedation for examination. Patients who are unable to cooperate with a pelvic examination or who lose control usually require heavy sedation or anesthesia. Gynecological examination under anesthesia helps to rule out imperforate hymen, but cannot assess the degree or location of vaginal spasm because any spasm disappears under anesthesia. A "normal" examination is deflating to a woman with vaginismus who knows that something is wrong, yet is unable to get a diagnosis. Some patients have considered suicide when they feel that there is no hope for improvement. One such patient in our practice was hospitalized twice for attempted suicide because of her vaginismus.

Stratifying the severity of vaginismus

It is the author's opinion that the ability to successfully treat vaginismus is related to the severity of the condition, which is influenced by both the amount of vaginal spasm and the degree of fear and anxiety [15] related to vaginal penetration. It is for this reason that a biomedical approach must take into consideration the psycho-social dimensions of vaginismus. Rosenbaum points out the importance of understanding vaginismus as both a physical and a psychological condition [16, 17]. Clinicians who do have the knowledge to diagnose and treat vaginismus rarely stratify this condition according to severity; rather, these patients are grouped together and treatment may not take into account a patient's ability to process and achieve treatment recommendations. A woman with mild vaginismus tends to behave very differently from a woman with severe vaginismus in that more severe cases may have penetration fear and anxiety that are so out of control that they are completely disabled by penetration attempts. These are the women who order dilators, but are "unable to open the box".

A clinician's demeanor tends to influence a patient's comfort during examination. Despite trying to cooperate, we have found that some patients cannot be examined, even under the gentlest of circumstances. Lamont stratified women into four groups of severity as noted by their behavior during gynecological examination. Grade 1 patients were able to relax, grade 2 patients were unable to relax, grade 3 patients tended to lift their buttocks, and grade 4 resulted in generalized retreat. Lamont noted that it was impossible to examine some of the more severe patients, especially grade 4 patients [5]. We suggested grade 5 severe vaginismus in patients who not only could not be examined, but had a visceral reaction to attempted examination [18]. This visceral "fight or flight" response may result in any one or more of the following: palpitations, hyperventilation, sweating, severe trembling, uncontrollable shaking, screaming, hysteria, wanting to jump off the table, a feeling of becoming unconscious, nausea, vomiting, and even a desire to attack the doctor (Table 1). Some patients think about their affliction "day and night" and have shared their stress when a gynecological examination is planned. One such patient commented, "I would rather die than have a GYN exam." The fear and anxiety of painful or impossible penetration creates many secondary changes in a woman's personality, such as feeling like a freak, feeling "less than" a woman, fear of her partner divorcing her or finding someone else, anxiety, depression, and suicidal ideation. One such severe vaginismus patient in whom 12 years of attempted treatments failed notes how this was among the "darkest and most embarrassing periods of my life causing me to live with vaginismus in silence and shame."

Education

The lack of education in medical schools, residency programs, and professional meetings results in an inability to diagnose and treat vaginismus. This creates confusion and despair for the patient who knows something is wrong; yet, is unable to get a diagnosis and treatment. Some of our treated patients, who were recent graduates from medical programs, could not recall any education about vaginismus. Medical meetings are of little help in disseminating this important knowledge in that it is rare for vaginismus to be on the program. Evaluation of patients from this practice shows that vaginismus patients were unsuccessfully treated for an average of more than 7 years [19]. Of 421 women evaluated since 2005, 35 were noted to have primary vaginismus for more than 15 years, and 5

Table 1 Classification of vaginismus

Grade	Description
Lamont grade 1	Patient is able to relax for pelvic examination
Lamont grade 2	Patient is unable to relax for pelvic examination
Lamont grade 3	Buttocks lift off table. Early retreat
Lamont grade 4	Generalized retreat: buttocks lift up, thighs close, patient retreats
Pacik grade 5	Generalized retreat as in level 4 plus visceral reaction, which may result in any one or more of the following: palpitations, hyperventilation, sweating, severe trembling, uncontrollable shaking, screaming, hysteria, wanting to jump off the table, a feeling of becoming unconscious, nausea, vomiting, and even a desire to attack the doctor

patients had it for more than 30 years, despite numerous evaluations and attempted treatments. One primary vaginismus patient (age 65) struggled for 44 years and was unable to get a diagnosis or treatment.

The inability of a woman to tolerate a gynecological examination (which in itself may suggest a diagnosis of vaginismus) may result in demeaning remarks from the examining physician or staff such as "Don't be a sissy," "Why can't you just relax," "Go home and come back after you have intercourse," and one physician who suggested that the husband should get a divorce. Telling a patient to have "a few drinks" is neither effective nor appropriate in overcoming vaginismus in that when reviewing the social histories of inquiries most vaginismus patients do not smoke or drink. Table 2 details condescending remarks that should be avoided, as noted in our patient questionnaires. Additional confusion results for both the clinician and the patient because the default diagnosis of sexual pain disorders is often vulvodynia or vestibulodynia, and it is only in recent years that a diagnosis of vaginismus has even been considered, despite it having been described more than 150 years ago [7]. Offering educational information and tools is more effective than condescending remarks in decreasing patient anxiety [20].

Table 2 What your patients do not want to hear (condescending remarks)

"Don't be a baby"
"Can't you just relax"
"It's all in your head" (very common)
"Come back when you are more relaxed"
"Have a drink" (also common)
"You need to take a Valium before you come for an exam. It's just because you are nervous"
"You need to practice stretching your vagina"
"It's just first time jitters"
"It will get better with time"
"Let me recommend some lubricants"
"You need to stop believing that your vagina is messed up because you are the one causing this and stopping yourself from having a normal sex life." (This comment after successful treatment of severe vaginismus but crying because of the speculum examination)
"The pain will go away after you have had sex a few times. You will get used to it."
"You know what, I'm going to use the baby speculum" (which never worked)
"There's nothing physically wrong with you"
"There must be something wrong with your relationship"
"Just tell yourself sex won't hurt and it will be okay"
"I won't examine you again until you receive sex therapy. Here is the name of a sex therapist that I recommend. After you see her, you can come back to try an exam"

Vaginismus treatment

A variety of effective treatments are available to help women overcome vaginismus. These treatments include the use of dilators, physical therapy with or without biofeedback, biofeedback, sex counseling, psychotherapy, hypnotherapy, and cognitive behavioral therapy. Treatment is a team effort and post-treatment counseling is usually needed regardless of the type of treatment utilized, because of the interplay of the physical and emotional aspects of vaginismus.

Dilator therapy

Although blinded, randomized studies showing the benefit of a dilation program have not been carried out, many clinicians agree that a dilation program is helpful in overcoming the physical aspects of vaginismus as well as the psychological handicap of fear and anxiety of penetration [11, 18]. Progressively larger dilators help to stretch the vagina and allow the woman to become comfortable with vaginal penetration. Asking a woman to simply purchase a set of dilators is a setup for failure in that most women do not know how to use their dilators and no support is given to overcome the emotional aspects of penetration. Some of our patients have spent years trying to overcome vaginismus by using dilators and not making the progress needed to achieve intercourse.

Dilators come in a variety of materials and sizes. They can be made of plastic, silicone or glass. Silicone lubricants should be avoided when using silicone dilators because "like dissolves like," causing an alteration in the structure of the dilator. We have noted that the larger sizes (5 and 6 [4- and 5-inch circumference respectively]) are needed to comfortably transition to intercourse, but are manufactured too long, causing about two inches to extend beyond the vaginal orifice. The round disc is also uncomfortable for patients. It is for this reason that we developed shorter glass dilators with the same circumference to make the dilation process more comfortable and to allow a woman to be more mobile during her dilation. The Pacik glass dilators are 3.5 inches in length and come in the usual sizes up to 6. For women who have larger partners these dilators are made to sizes 7 and 8. An ergonomic fit allows more comfortable contact with the vulva.

On the day after treatment we spend time during our counseling session explaining how dilators should be used, overcoming the anxiety associated with the use of dilators, the importance of continued progression to the larger sizes, transitioning from dilators to intercourse and coital positions that relax the pelvic floor. Our patients have indicated that the use of a vibrator helps them relax during the dilation process. Most of our patients are able to sleep with a medium 4 (3.25-inch circumference) dilator every second night and to progress with a morning dilation to the next size up. Patients are encouraged to dilate 1 h in the morning and 1 h in the evening

(or 2 hours in the evening for those who have an early work schedule) for the first month, reducing this schedule as the larger dilators become more comfortable for a longer period of time [11]. It has been observed that patients may regress after 6 months and for this reason some dilation is recommended each week for a year and for 30–60 min prior to intercourse or gynecological examination. Finger penetration (own finger, partner's finger) has been found to be helpful to initiate dilation. Patients are asked to keep daily logs of their dilation for about 1 month, then weekly logs. This creates accountability for the patient and allows the clinician to support the patient.

Physical therapy

Physical therapists (PTs) who have specialized training in the evaluation and treatment of pelvic floor disorders are skilled in assessing the musculoskeletal components in genital and pelvic pain [8]. Myofascial trigger point releases of tight or spastic muscles may be combined with the stretching of the hip rotators. Although attention is directed at releasing levator ani spasm, it has been observed that most of our patients have isolated hypertonus or spasm located at the introitus. Isolated stretching of the introitus and incorporating dilators can be an effective form of treatment for vaginismus. Biofeedback alone or in combination with physical therapy and surface electromyography helps the patient understand how to lessen tension in the pelvic floor. Women who have a severe aversion to pelvic floor touch or any form of penetration associated with overwhelming fear and anxiety may struggle with these techniques and fail to make the progress needed.

Sex counseling

Sex counseling helps the couple improve their communication skills, aids in overcoming compromised libido, and can help with anxiety reduction and depression. It can be of value in learning how to progress with dilators and is helpful in supporting less severe cases of vaginismus. Severe vaginismus patients in our practice are noted to be prone to failure following sex counseling in that physical penetration is still not possible, despite an understanding of vaginismus. Post-procedure sex counseling can be of great benefit to help couples who have been sexually compromised as a result of vaginismus. An excellent review of sex counseling can be found in chapter 12 of Levine's text [21].

Psychotherapy and hypnotherapy

Psychotherapy and hypnotherapy are aimed at reducing the anxiety associated with vaginismus and are of value when working with sexually abused women. Cognitive behavioral therapy (CBT) helps patients understand the thoughts and feelings that influence behaviors [22, 23] and helps alter the fear of penetration and avoidance behavior. These techniques are helpful for less severe vaginismus. We have found that more severe vaginismus patients have difficulty transitioning from "talk therapy" to the dilation needed for intercourse to be successful.

Botulinum toxin A to treat vaginismus

Botulinum toxin A (Botox) injections appear to be a promising treatment for vaginismus based on prior evidence from small trials and can be used for both mild and severe cases of vaginismus. This approach was first described by Brin and Vapnek [24] and later developed by a number of investigators [11, 18, 19, 25–32]. A systematic review and meta-analysis of Botox for vaginismus treatment noted the lack of published randomized control studies [33]. The use of Botox for conditions of the female pelvis has been described [34–36].

Pacik multimodal program

Our program utilizing Botox and progressive dilation under anesthesia with post-treatment counseling and support to treat vaginismus has been a "work in progress" since 2005 [11, 18, 19, 27]. In 2010, we received Institutional Board Review approval (IRB), FDA approval and Investigational New Drug approval to initiate a pilot study of 30 vaginismus patients, which included the use of onabotulinumtoxinA (Botox; Allergan, Irvine, CA, USA), bupivacaine injections and progressive dilation under anesthesia. This study was registered with clinicaltrials.gov (NCT01352546) [28]. All patients participated in post-procedure counseling and agreed to long-term follow-up by emailing their daily diaries of dilator use, and intercourse. Female Sexual Function Index (FSFI) [13] scores were completed at baseline, and at 3, 6, and 12 months post-procedure. At 1 year 97 % of the patients were able to achieve comfortable intercourse or for single women without partners use a large dilator, as noted by FSFI

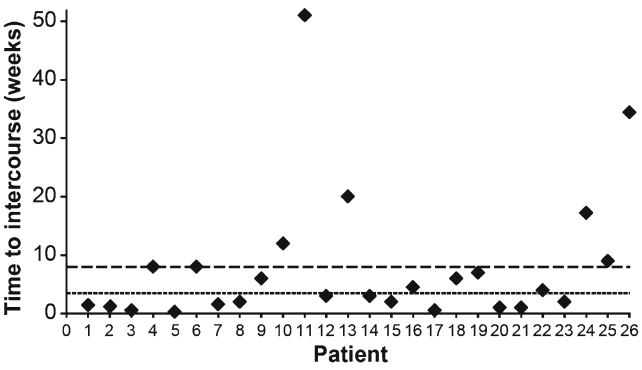

Fig. 1 Time to pain-free intercourse after treatment. Data are indicated for the 26 patients who achieved intercourse within 1 year and who indicated a time. An additional 2 achieved intercourse, but did not indicate the time. *Short dashed line*, median; *long dashed line*, mean

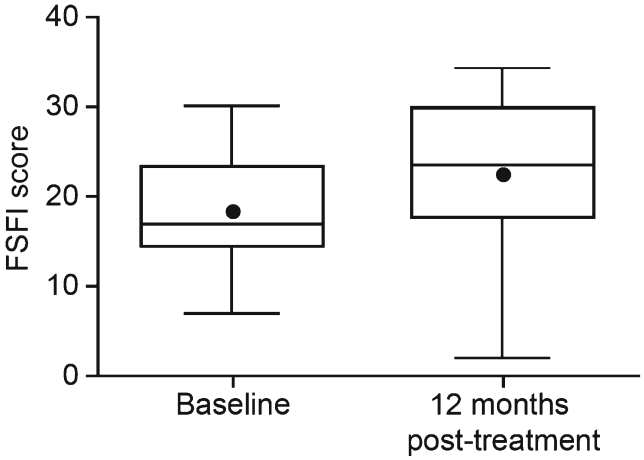

Fig. 2 Female Sexual Function Index (FSFI) scores at baseline and at 12 months post-treatment. *Dot* mean, *line within box* median, *top and bottom of box* interquartile range, *whiskers* minimum and maximum

scores and daily logs [19]. In this cohort there were no recurrences and no adverse events. Figure 1 shows time to intercourse and Fig. 2 shows the change in the FSFI score as presented to the 2013 annual meeting of the American Urogynecologic Society [19].

The program consists of injecting 100 units of Botox under anesthesia into the lateral aspects of the introitus, marked by the residual hymenal fragments, from 7–9 o'clock on the patient's right and 5–7 o'clock on her left (Fig 3). Rarely, tightness or spasm involving the levator ani requires the injection of an additional 50 units of Botox. At times, a limited hymenectomy is performed by excising small triangular wedges from the 3 o'clock and 9 o'clock areas to release a constricting mucosal band. Bupivacaine 0.25 % with 1:400,000 epinephrine is injected along the right and left vaginal walls, which allows the patient to wake up with a large dilator in place and helps the patient achieve early pain free (8–12 hours) dilation in the recovery area and after discharge. It has been found that waking up with a large dilator helps "flip a switch" [11] allowing the patient to become comfortable with the dilation process both physically and emotionally. We have found that the dilation progress is quicker and more effective this way than waiting the 2–7 days for the Botox to become effective before initiating dilation.

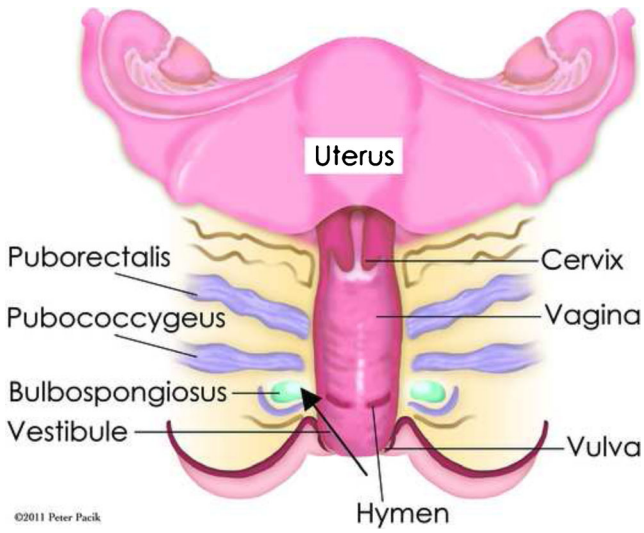

Fig. 3 Schematic of anatomy showing injections at the lateral aspects of the introitus in the area of the hymenal remnants (*black arrow*)

Although this multimodal program for the treatment of vaginismus continues to achieve a high rate of success, as noted by the long-term follow-up, there are no studies comparing progressive dilation under anesthesia with injection of Botox, indicating a need for blinded, randomized studies.

Summary of post-procedure counseling

Patients will often report that though they are doing well with dilation they "need to catch up emotionally to where they are physically." This means that they are doing well with physical penetration, but lagging emotionally in becoming comfortable with or enjoying intercourse. Post-procedure counseling, support, and follow-up are essential for success, regardless of the treatment program employed [11]. Numerous post-procedure challenges remain, including residual fear and anxiety about penetration [15, 17, 21], avoidance and pain catastrophizing

Table 3 Counseling needs. Physical and psychological support

• Recommendations for effective dilation
• Importance of keeping a dilation diary. This will keep the patient accountable for her dilation as well as keeping the clinician informed
• Dress up, "dress down"; setting the stage for romance
• Use of aids such as vibrators and small vibrating dildos to overcome the clinical aspect of dilating
• Sensate focus exercises
• Coital positions of pelvic floor relaxation
• Transitioning from dilators to intercourse. Tip only, minimal penetration, no thrusting during the early attempts at intercourse
• Male and female ergonomics for comfortable intercourse
• Managing setbacks
• Validating the need to "catch up emotionally to where I am physically." Patients tend to make progress more quickly with dilators (physical) than transitioning to intercourse (psychological)
• Overcoming involuntary thigh adduction ("leg lock") when transitioning to intercourse
• Sex counseling, management of low libido/anorgasmia
• Managing relationship problems
• Managing erectile dysfunction, male hostility
• Managing anxiety
• Overcoming the "dreaded" gynecological examination

This list is incomplete. Patients may require considerable post-procedure support for about 6 to 12 months. Customized counseling for individual needs is helpful

[37], disgust issues [38], low libido [39] (sometimes of both partners), anorgasmia, relationship problems, partner's solicitousness and hostility [40], infidelity, and erectile dysfunction [41]. An incomplete overview of support can be found in Table 3.

Ineffective treatments

In our practice the use of Kegel exercises, lubricants, topical anesthetics, anti-depressants, anti-anxiety medication, sedatives, excess alcohol, hallucinogenic drugs, muscle relaxants, and hymenectomy do not appear to be helpful in the treatment of vaginismus. Endoscopic evaluation for endometriosis was unnecessary in one such patient who developed postoperative complications. Two patients had an unnecessary hymenectomy combined with episiotomy.

Conclusion

Vaginismus has a considerable impact on the integrity of relationships and undermines both the woman's and the man's feelings of self-worth. Women need both physical and emotional support to overcome a condition that can linger for many years. Women struggling with vaginismus can be effectively treated using a variety of approaches. Stratifying the severity of vaginismus has been found to be of value in helping to determine the best course of treatment. More education for clinicians is needed to support and help these women.

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Conflict of interest None

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