Dyspareunia Treated By Bilateral Pudendal Nerve Block

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Abstract

In this report, we present a patient with refractory superficial dyspareunia of unclear etiology, who was successfully managed with a bilateral pudendal nerve block. Initial workup failed to identify an obvious source for the pain and first-line therapy for post-menopausal superficial dyspareunia was not effective. A bilateral pudendal nerve block alleviated the problem to three years follow-up. In this report, we review the current dyspareunia literature and propose a diagnostic algorithm.

Keywords: Dyspareunia; Organ prolapse; Vaginitis; Pudendal nerve block; Vulvar vestibulitis

Introduction

Dyspareunia, genital pain with intercourse, is a highly prevalent problem amongst female patients and a common cause of sexual dysfunction [1]. Dyspareunia is commonly classified as superficial or deep depending on the location of the pain. Superficial dyspareunia results from pain at the vaginal introitus upon penile penetration, whereas deep dyspareunia occurs with deep thrusting of the penis. Multiple studies have determined that the majority of women with dyspareunia report superficial pain associated with penile entry [2-4]. The etiology of dyspareunia is often multi-factorial, and therefore consistent characteristics of patients with dyspareunia are lacking [4]. The presentation may vary from localized pain to generalized disinterest in sexual experiences, making dyspareunia one of the more difficult clinical obstacles to treat with good patient outcome [4,5]. In this report, we present a case of superficial dyspareunia managed with bilateral pudendal nerve block.

Case Report

A 48-year-old postmenopausal female on hormone replacement therapy was seen for vaginal pain associated with sexual intercourse for 6 months duration. Intercourse and sexual habits had been normal and unrestricted prior to onset of pain. Pain was present at the distal 1/3rd of the vagina and was described as stabbing in nature. Pain scale was 8/10 and was present only with superficial penetration during intercourse. There was no pain upon voiding or at rest. Symptoms recurred with every sexual attempt and resulted in inability to complete the sexual act. The

patient's last sexual attempt was 2 weeks prior to presentation. The patient was in a stable long term marriage with no history of physical, sexual, or emotional abuse. Patient denied use of alcohol, tobacco, and illicit drugs. There was no history of psychiatric conditions, endocrine abnormalities, neurologic illnesses, pelvic trauma, sexually transmitted infections, incontinence, pelvic floor disorders, urological problems, endometriosis, or vaginal stenosis. The patient previously had multiple abdominal incisions, including two elective C-sections and a total abdominal hysterectomy for dysfunctional uterine bleeding 4 years prior to presentation. 2 years after the hysterectomy, the patient complained of abdominal pain and underwent laparoscopic lysis of adhesions with a successful outcome. The patient also reported one uncomplicated urinary tract infection, which resolved with antibiotics several years prior to presentation. Menarche was at 12 years of age and periods were irregular until the hysterectomy. The patient was previously seen by her gynecologist, who had recommended vaginal lubrication and psychotherapy. Patient refused psychotherapy and was using vaginal lubricants with minimal effect.

Physical examination revealed normal external genitalia and a non-tender clitoris with a normal clitoral hood. Speculum examination was unremarkable. The urethra was non-tender and bimanual examination revealed pain present at the distal 1/3rd of the vagina upon digital penetration of the vaginal orifice. No vaginal or adnexal masses were palpable. Rectal examination revealed no masses and good anal sphincter tone. A hormone panel which included estradiol, testosterone, and prolactin, was normal. Pelvic organs were assessed by trans-abdominal ultrasound, which demonstrated normal adnexa without cystic or solid masses, and no sonographic signs of inflammation or free fluid in the pelvic cul-de-sac. A cystoscopy was performed and was unremarkable.

The patient underwent a one-time bilateral transgluteal fluoroscopy-guided pudendal nerve block achieved with injection of 3 cc 0.25% bupivacaine under sedation. Following the procedure, intercourse was painless and orgasm was achieved. The patient returned to her normal pattern of sexual habits with no pain after three years of follow-up care.

Discussion

Dyspareunia has been estimated to have a lifetime incidence of over 60% in women [1]. Dyspareunia is much more common in women than men and has been associated with pain initiating from vulvar surfaces to deep perineal structures [4]. Although the distinction between superficial and deep dyspareunia may help to better characterize and diagnose the cause of the pain, dyspareunia is a multifaceted disease.

The vagina is a dilatable musculo-membranous conduit which originates at the vaginal orifice and extends to the middle cervix. The vagina has several important functions to support normal sexual functioning and serves as an outflow tract for menstrual fluid and comprises the inferior aspect of the birth canal, where it communicates superiorly with the cervix and inferiorly with the vaginal vestibule [6]. The vestibule of the vagina is defined as the area bound by the labia minora and contains the vaginal orifice as well as several para-vaginal structures such as the external urethral orifice and ducts of the greater and lesser vestibular glands [6].

The pudendal nerve originates from the ventral rami of S2-S4 and supplies the striated muscles of the perineum and most of the perineal skin, distributing branches to the distal vaginal wall, clitoris, and labia [7-9]. The pudendal nerve exits the pelvic cavity via the greater sciatic foramen, inferior to the piriformis muscle. The nerve then immediately courses onto the dorsal surface of the sacrospinous ligament to pass through the lesser sciatic foramen, where it enters the perineum on the inner surface of the obturator internus muscle. In the perineum, the pudendal nerve divides into its three terminal branches-the dorsal nerve of the clitoris/penis, the perineal nerve, and the inferior rectal nerve. In females, the perineal nerve innervates the muscles of the perineum as well as the skin of the labia major, labia minora, and vaginal vestibule [7,9].

The innervation of the vagina is both somatic and autonomic in nature. As previously stated, the inferior 1/5th to 1/4th of the vagina is somatically innervated via the perineal nerve [6,9]. The remaining areas of the vagina receive visceral innervation from the uterovaginal nerve plexus, which extends to pelvic viscera from the inferior hypogastric plexus. These fibers carry efferent sympathetic and parasympathetic input, as well as visceral afferent innervation to the upper vaginal wall [6,8]. Due to this anatomical organization between somatic and visceral innervation, the majority of the vagina does not contain somatic sensory corpuscles. Therefore, the ability to detect touch and pain is principally located in the most inferior aspect of the organ [6].

Somatic nociception is carried principally by A delta fibers, prevalent in the vulva and returned to the central nervous system via the pudendal nerve. Although C fibers innervate the viscera within the vagina and cervix, afferent pain information from these fibers is not typically conducted except in circumstances of repeated mechanical or chemical stimulation [5].

Table 1 demonstrates an extensive list of etiologies of superficial and deep dyspareunia. Because dyspareunia is often multi-factorial, it is very difficult to diagnose and treat effectively.

Table 1: Differential diagnosis of dyspareunia according to location of the pain.

Superficial	Deep	Both
Atopic dermatitis	Adenomyosis	Anxiety
Bartholin's gland cyst or abscess	Adnexal tumors and infections	Depression
Candidal vulvovaginitis	Bladder stones	Iatrogenic pain post gastrointestinal or genitourinary instrumentation
Contact dermatitis	Cervical polyps	Insufficient lubrication
Female genital mutilation syndrome	Cervicitis	Perineal ulcers or scars
Herpetic neuralgia	Chemotherapy	Sjoggren's syndrome
Interlabial masses	Crohn's disease	Sexual abuse
Imperforate hymen	Diseases of the clitoris	Urogenital atrophy
Lichen Sclerosis	Diverticulitis	Vaginal and pelvic trauma or surgery
Piriformis syndrome		
Pudendal neuropathy	Dysmenorrhea	
Skene's duct cyst	Endometriosis	
Urethritis	Endometritis	
Urinary tract infection	Episiotomy scars	
Vaginal cyst	Fibroid uterus	
Congenital vaginal septum malformations	Interstitial cystitis	
Vaginal stenosis	Intravaginal foreign bodies	
Vaginitis	Irritable bowel syndrome	
Vaginismus	Levator ani spasm	
Vulvar Vestibulitis	Lower ureteral stones	
	Malfunction of IUD	
	Osteitis pubis	
	Pelvic adhesions	
	Pelvic congestion syndrome	
	Pelvic fracture	
	Pelvic inflammatory disease	
	Pelvic malignancies	
	Pelvic organ prolapse	
	Pelvic radiation	
	Pelvic tuberculosis	
	Radiation seed implantation	
	Rectal prolapse	
	Retroverted uterus	
	Ulcerative colitis	
	Ureteral/urethral stricture	
	Urethral diverticulum	
	Thrombosed hemorrhoids	
	Vaginal stenosis	

History and Physical Examination

(Include detailed pelvic and rectal examination and evaluation of pudendal nerve function by perineal sensation and anal sphincter tone)

Laboratory Testing

(CBC, Chem. 8 and serum estradiol, am testosterone, prolactin and sex hormone binding globulin, thyroid panel and pap smear if uterus is present)

Initial Imaging Studies

(Pelvic and transvaginal ultrasound/duplex Doppler, as well as proctoscopy and/or colonoscopy for any suspected lower GI tract issues)

If ultrasound or physical findings are abnormal

(CT scan with and without contrast and or upright MRI, MRV of the pelvis)

Figure 1: Diagnostic workup of dyspareunia.

In Figure 1, we propose a diagnostic scheme to work up a patient with dyspareunia.

We recommend that after a detailed history and pelvic exam, if a clear etiology for the pelvic pain cannot be identified, the patient should be instructed to keep a pain diary that outlines the nature of the pain, exacerbating or alleviating factors, whether it is superficial or deep, or positional dependent. The patient should be instructed to apply water-soluble sexual or surgical lubricant during intercourse. If condoms are being used, the patient should be checked for the presence of latex allergy. A moisturizing skin lotion may be recommended as an alternative lubricant unless the patient is using a condom or other latex product. Further recommendations that may be appropriate are a change in coital position, local estrogen treatment in post-menopausal women, and consultation with a sex therapist and/or psychiatrist. Should the above measures fail, a bilateral transgluteal or transvaginal pudendal nerve block may be therapeutic in the case of superficial dyspareunia.

As a result of the anatomy and function of the pudendal nerve, a bilateral pudendal nerve block may be an effective therapy for superficial dyspareunia. Current literature indicates that a pudendal nerve block is a therapeutic option for pudendal neuralgia and vulvodynia [10,11] and may be accomplished by a transgluteal, or transvaginal approach [10,12,13]. Although this patient did not suffer from any adverse effects, a pudendal nerve block is not without complications. One study reported the procedure to cause headache, muscle ache, fecal incontinence, urinary incontinence and leg numbness [14]. This case demonstrates that more prospective studies are essential to further determine the role of bilateral pudendal nerve block in the diagnosis and treatment of female patients with dyspareunia.

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