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PT and PNE

By Stephanie A. Prendergast, MPT, and Jerome M. Weiss, MD

Musculoskeletal dysfunction is the cause of myriad pelvic pain syndromes, such as vulvodynia, interstitial cystitis, prostatodynia, coccygodynia, urgency-frequency syndrome, dyspareunia and proctalgia fugax. As a consequence, physical therapists specializing in pelvic floor dysfunction have played an integral role in the successful treatment of patients with pelvic pain.

However, when it comes to pudendal nerve entrapment (PNE), a recently described pelvic pain entity, physical therapists are currently the most underutilized practitioners involved in its management. Therefore, it is beneficial to recognize how PNE is being defined and treated, and to point out the value of pelvic floor physical therapy in the management of PNE pain.

### **Functional Anatomy**

The pudendal nerve, originating from S2, S3 and S4, is comprised of both autonomic and somatic fibers. The nerve follows a tortuous course through the pelvis to innervate the majority of the pelvic floor muscles, the urethral and anal sphincters, the distal urethra, and the majority of genital and perineal skin.

When dysfunction occurs, the pelvic floor and the pudendal nerve are concurrently involved. That is, pudendal nerve irritation leads to muscular dysfunction and, conversely, muscular dysfunction can lead to pudendal nerve irritation. The patient can present with a host of seemingly enigmatic symptoms, such as urinary urgency, frequency, hesitancy and burning, painful bowel movements, dyspareunia in women, post-orgasmic pain in men and women, vulvar itching and burning, and clitoral, penile, rectal, perineal and sacrococcygeal pain. The reason is that hypertonic pelvic floor muscles compress the penetrating organs and the pudendal nerve, resulting in symptoms that resemble visceral problems and cause skin sensitivity. Consequently, patients and physicians are often confused when there is no culture-proven urinary or vaginal infection or evidence of urologic, gynecologic or colorectal disease.

What appear to be reasonable empiric treatments, such as medications, topical creams and surgical interventions, often prove to be unsuccessful and can exacerbate or perpetuate the condition. Unfortunately, the actual causes of the genitourinary pain, including muscle hypertonicity, myofascial trigger points, adverse neural tension on the pudendal and other peripheral pelvic nerves, connective tissue restrictions, sacroiliac joint dysfunction (SIJD) and diastasis recti, are left untreated.

Until the mid-1980s, information on the pudendal nerve was primarily focused on urinary and fecal incontinence secondary to childbirth or a surgical intervention. In the past few years, publications have begun to acknowledge that trauma to the pudendal nerve can be a source of pelvic pain. However, its interactions with myofascial pain syndromes are often overlooked.

### **Pudendal Nerve Entrapment**

The diagnosis of PNE is made by three criteria: subjective complaints of pelvic pain with sitting that improve when sitting on a toilet seat or when standing; an abnormal or prolonged pudendal nerve motor terminal latency test; and a decrease in symptoms following a pudendal nerve block.

When these three criteria are present, many physicians make two assumptions. The first is these three factors are indicative of a peripheral nerve entrapment at the ischial spine, and/or the sacrotuberous and

sacrospinous ligaments, and/or at Alcock's canal. The second assumption is that this entrapment is the source of the patient's pain and dysfunction.

There are two schools of thought on how to manage PNE—through either surgical or conservative management. Although both include pudendal nerve blocks, the divergence of opinion comes with the use of physical therapy.

### **Surgical Management**

Some physicians recommend that patients attempt management of the symptoms first through pudendal nerve blocks and avoidance of aggravating behaviors (i.e., sitting). If symptoms persist, a pudendal nerve decompression surgery is recommended.

Presently, the two locations in the United States performing the majority of the procedures are in Texas and Minnesota. The procedure involves making a transgluteal incision, deflection of the gluteus maximus fibers from the sacrotuberous ligament, sectioning of the sacrotuberous ligament to expose the pudendal nerve trunk and incising of the sacrospinous ligament to allow anterior transposition of the nerve away from compressing structures. The nerve is also freed from the fascial tunnel known as Alcock's canal. After the surgery, postoperative recommendations are to avoid sitting upright, squatting and lifting and most physical activity for six months to one year.

At the International Pelvic Pain Society's Annual Meeting in August, Dr. Lee Ansell, the neurosurgeon who performs the PNE surgery in Houston, reported his results on 26 patients. His abstract stated that "65 percent of the patients were positive responders after surgical decompression and 35 percent were non-responders. Of the positive responders, 46 percent had greater than 50 percent improvement and 19 percent were partial responders having less than 50 percent improvement. The non-responders had no improvement."

### **Conservative Management**

At the Pacific Center for Pelvic Pain and Dysfunction located in San Francisco, we are conducting a research study on conservative management of patients who have the objective and subjective findings of PNE. Our protocol consists of both pudendal nerve blocks and physical therapy.

Clinical data has been collected on 174 patients, of which 18 were postoperative and 156 were not. All of the patients with diagnosed PNE presented with some or all of the following comorbidities: subcutaneous panniculosis, intrapelvic and extrapelvic muscle hypertonicity (including the short pelvic floor), myofascial trigger points, adverse neural tension on peripheral pelvic nerves, ligamentous/joint laxity, presence of a diastasis recti, abnormal neuromuscular recruitment patterns and abnormal pelvic/lower extremity/hip biomechanics.

Conservative treatment consisted of internal and external myofascial release of hypertonic pelvic girdle musculature, connective tissue manipulation to minimize the subcutaneous panniculosis (this refers to a change in skin density that occurs reflexively when visceral irritation occurs. The end result is unhealthy tissue that can be a source of pain and that can also reflexively act to cause visceral irritation), neural mobilization techniques to decrease adverse neural tension, stabilization exercises to correct faulty neuromuscular recruitment patterns, muscle imbalances and diastasis recti correction, avoidance of aggravating factors including repetitive concentric exercise which perpetuate the short pelvic floor (i.e., Kegel exercises, repetitive rectus abdominus contractions, sitting on hard surfaces for prolonged periods of time), pudendal nerve blocks, acupuncture/dry needling of panniculosis, subcutaneous injections into the panniculosis and trigger point injections, and biomechanical correction (e.g., joint mobilization, orthotic devices and proliferative therapy if indicated).

Of the initial 156 patients with PNE who had not had surgery, 45 received conservative treatment once a week for six to 12 months. The symptoms quantified included urinary, bowel and sexual dysfunction, overall pain levels, work performance and social functioning. More than 88 percent of the patients had 70 percent to 100 percent improvement of their symptoms and did not pursue surgery, while the remaining 11 percent did pursue surgery.

All of the 18 postoperative patients had a degree of SIJD following surgery. Of those, nine showed no signs of SIJD prior to surgery and all presented with the aforementioned comorbidities. The patients in this group were at least six months to two years postoperative. They sought out treatment because symptoms remained or were worse than their preoperative pain levels. Nearly 39 percent of patients reported feeling symptomatically worse compared to their preoperative functioning. A third of the patients presented no change, 27.7 percent were better but did not meet their postoperative expectations, and 100 percent of the patients still could not sit without pelvic pain.

These 18 patients were then treated with the conservative protocol, once a week for six to 12 months. The majority of these patients—88.8 percent—reported 50 percent to 90 percent improvement, 5.5 percent had 20 percent improvement, and 5.5 percent had no change with therapy.

## **Conclusion**

Physicians rarely recommend that a patient undergo postoperative rehabilitation. The majority of our patients have sought care on their own when they were unhappy with the results of the procedure. When one considers the degree of tissue dysfunction in a patient with PNE, the biomechanical consequences of the surgery and the effects of surgical trauma, it is not surprising the pain continues after surgical decompression.

Furthermore, there is evidence to support the fact that the three diagnostic criteria for PNE may not be able to accurately define the source of pain, which may not always be the pudendal nerve. Therefore, surgical intervention based on the PNE diagnosis alone may be too aggressive without proper physical therapy management first.

Presently there is a discrepancy between what is considered a surgical success and the postoperative expectations of patients. In the event a surgical decompression has been performed, our data supports that postoperative rehabilitation must be considered for a successful functional outcome. Physical therapists are specialized in the evaluation and treatment of myofascial, biomechanical and neural tension disorders, and therefore need to be included in the management of PNE.

*Stephanie Prendergast has specialized in the evaluation and treatment of complex pelvic pain syndromes. She is the supervising physical therapist at the Pacific Center for Pelvic Pain and Dysfunction in San Francisco, a multi-disciplinary practice founded by Jerome M. Weiss, MD. She serves on the board of directors of the International Pelvic Pain Society and lectures through this organization.*

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