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## *Pitfalls in the Effective Diagnosis and Treatment of Pudendal Nerve Entrapment*

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Many pitfalls in the effective diagnosis and treatment of pudendal nerve entrapment have been uncovered after caring for hundreds of patients. These have become valuable lessons that have been used in both establishing an accurate diagnosis and improving results with nonsurgical therapy.

### **An Algorithm to Avoid Pitfalls in Diagnosis**

Even though there is an increasing awareness that pudendal nerve entrapment is a common source of various pelvic pain syndromes, it is not always recognized that pudendal neuralgia may result from causes other than entrapment. This is significant in that appropriate treatment cannot be administered until the underlying etiology of the neuralgia is determined.

Because of the extensive distribution of the pudendal nerve, patients with pudendal neuralgia complain of a host of symptoms that include perineal, anal, genital pain and dysfunctions such as urinary hesitancy, frequency, urgency, painful voiding, difficult and painful bowel movements, and painful orgasms. Even though many of these symptoms are increased with sitting and improved with standing, they are not necessarily diagnostic of pudendal nerve entrapment. Rather, they only point toward a generic myofascial and/or nerve dysfunction.

Therefore it is important for practitioners to have an algorithm that can and guide them to a proper treatment program for the three categories of neuralgia. The pudendal nerve can become sensitive when (1)it is compressed by a ligamentous or fascial entrapment, (2)bombarded by noxious stimuli from myofascial, skin or visceral pain, or (3) when the proximal component sacral nerve roots are compromised.

Depending on the practitioner, the diagnosis of **pudendal nerve entrapment** is typically made by some or all of the following: a history of pain in the pudendal nerve distribution, an associated trauma, pain with sitting which is improved with standing or sitting on a toilet seat, a positive Tinel’s sign on palpation of the nerve, positive electrophysiological testing (sacral reflex testing, pudendal nerve terminal motor latency tests), and pain relief with a pudendal nerve block.<sup>1-4</sup>

Comparable pudendal nerve sensitivity or neuralgia may be caused by **bombardment of its peripheral nociceptors by pain in local visceral or somatic structures**. In particular, the nociceptors in myofascial trigger points are continuously stimulated leading to lasting changes in the receptor itself, the peripheral pudendal nerve or even the CNS.

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A similar process is also activated when the **sacral nerve roots** are compressed thus affecting the axoplasmic flow/ sensitivity and resulting in a double crush injury with distal nerve fixation. In both of these situations, the entire pudendal nerve may become sensitive to touch, and theoretically perpetuate the pain syndrome.

To further increase the confusion, all of the individual causes of pudendal neuralgia are often present together i.e., myofascial, visceral, and neurological. Their coexistence can result in a vicious circle whereby a noxious input from one source causes a continuous feedback loop. Frequently, muscle or skin pain can lead to nerve dysfunction, which in itself can further maintain the muscle hypertonicity and skin sensitivity. Therefore, the first step in initiating a successful treatment plan is determining the underlying cause of the neuralgia. If this is not done, the source will be a perpetuating factor that will prevent symptom resolution. An example is that myofascial trigger points/hypertonus cannot be eradicated if the muscles are responding to noxious visceral or nerve input.

It is important to initiate an evaluative process to aid in the differential diagnosis since all of these conditions, i.e. painful viscera, muscle and skin, or sacral nerve root compression can simulate pudendal nerve entrapment.

**Visceral disease** must be the first layer to rule out. The major visceral sources are gynecological (endometriosis); urological (interstitial cystitis or chronic prostatitis); or gastroenterological (inflammatory bowel disease or irritable bowel syndrome).

Once the visceral evaluation is complete, examination of the **pelvic floor and associated structures** is performed to determine the length of the pelvic floor, painful trigger points and connective tissue restrictions. The question that needs to be answered is: are the trigger points and shortened muscles creating the pudendal nerve sensitivity or is the nerve sensitivity causing the musculoskeletal dysfunction? In the absence of the appropriate electrophysiological testing, this may be ascertained by a decrease in nerve tenderness after short, painful muscles and restricted connective tissue have been normalized through physical therapy.

In the event nerve tenderness persists after somatic dysfunction has been corrected, the diagnosis of **pudendal nerve entrapment** is more likely. A referral to a center that performs sacral reflex testing and pudendal nerve terminal motor latency tests is indicated.

Evaluation of **sacral nerve root dysfunction** can be made with a lumbosacral MRI.

### Pitfalls in Treatment of Pudendal Neuralgia

It is common for patients to be advised to undergo pudendal nerve decompression surgery after three pudendal nerve blocks with steroids do not result in significant relief. Pitfalls in conservative treatment may stem from the (1) omission of physical therapy techniques to comprehensively address all areas of pelvic dysfunction and (2) inadequate pudendal nerve blocks.

### Physical Therapy

Physical therapy is a valuable and overlooked component of a treatment plan for pudendal neuralgia. After evaluating hundreds of patients with "pudendal nerve entrapment" we found they commonly present with some or all of the following comorbidities: connective tissue restrictions, peripheral adverse neural tension, intrapelvic and extrapelvic muscle hypertonicity and/or myofascial trigger points, biomechanical abnormalities (particularly regarding the sacroiliac joint), decreased core strength and faulty neuromuscular recruitment patterns. These dysfunctions have also been identified in the patients with persistent post-operative pain following pudendal nerve decompression procedures.

In order to identify all the possible sources of pain a thorough physical therapy examination<sup>5,6</sup> includes: (1) **Biomechanical screening** (2) **Detailed evaluation of connective tissue** in the common sites of viscerosomatic pain referral, i.e. the abdomen, vulva, groin, perineum, low back and lower extremities.<sup>7</sup> Manipulation of these tissues often reveal ischemia, denseness, and pain which can add to the total pain picture.<sup>8</sup> (3) **Examination of the intrapelvic and extrapelvic muscles**

to identify hypertonic, painful muscles and myofascial trigger points. (4) **Adverse neural tension** can also create pudendal neuralgia and the illusion of pudendal nerve entrapment. When a nerve is under adverse tension, normal neural movement is prevented and results in symptoms in what would otherwise be normal activity. Examples include pain during bowel movements (tension issues) and pain during sitting (compression issues).

After the specific problems have been identified they are treated with: connective tissue manipulation, external myofascial and trigger point release, internal pelvic floor lengthening, mobilization of peripheral nerves and abnormal joints, and a home exercise program for pelvic floor lengthening and core strengthening.

Since these patients have typically had their symptoms for many years they develop central sensitization. For this reason physical therapy alone may not be successful in completely eradicating symptoms. A multidisciplinary approach involving pharmaceutical management, trigger point injections, dry needling and pudendal nerve blocks will expedite improvement.

In our clinic patients typically are seen one hour per week for physical therapy and one to four times per month for trigger point injections, dry needling, pharmaceutical management and pudendal blocks. The length of treatment may be two months to several years depending upon the severity, perpetuating factors, and the duration of the patient's symptoms.

### Pudendal Nerve Blocks

Even though X-ray guided blocks at the ischial spine and/or Alcock's Canal are the norm in the diagnosis and treatment of pudendal nerve entrapment, it may not be the most effective approach because of the anatomic variations of the nerve. It has been shown that the pudendal nerve has: (1) multiple trunks, which take numerous pathways<sup>9</sup> (2) variations in the clitoral/penile branch that can exit proximal to Alcock's Canal<sup>10,11</sup> (3) a fibrous-osseous canal distal to Alcock's canal in the area of the urogenital diaphragm<sup>12</sup> (4) a right angle exit of the perineal branch which increases its vulnerability to fixation.<sup>13</sup>

In addition to these variations, pathology can occur in the nerve branches because of the double crush syndrome. When the pudendal nerve is fixed at the ischial spine or Alcock's Canal the nerve branches lose mobility subjecting them to stretch injuries with movement of the attached somatic structures. This is especially seen where nerves exit at right angles as seen with the perineal branch. In this case perineal pain may be persistent following surgery or standard CT-guided blocks directed at the ischial spine and Alcock's Canal. The newly described fibro-osseous canal at the level of the urogenital diaphragm may also be responsible for persistent clitoral and penile pain unaffected by the above blocks and surgery.<sup>12</sup>

Areas of nerve entrapment are accompanied by sensitivity that acts as a marker of disease. This advantage is lost with X-ray guided techniques, but gained with selective trans-perineal finger-guided blocks. Finger guidance can not only localize the involved segment of the nerve, but can also determine if the block was successful by clearance of the sensitivity post-injection. If tenderness persists re-injection could be done at that time for a more effective outcome. Commonly in our clinic selective finger-guided blocks have been successful when ischial spine and Alcock's canal blocks have failed.

### Summary

There are many pitfalls that hamper the establishment of an accurate diagnosis and of successful therapy of pudendal nerve entrapment. The consequence is that patients continue to have significant pain, even after surgical decompression.

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## The President's Perspective

I am delighted to be writing this perspective as President of IPPS and as an anaesthetist in pain medicine. The IPPS has always welcomed members from varied health professional backgrounds and from a range of countries. There is wide variation in the roles and responsibilities of healthcare professionals across continents. This rich eclectic mix has enabled all of us to learn different strategies from our colleagues and to develop and expand our own practices.



*Beverly Collett, MD*

Chronic pelvic pain is a challenging condition in both men and women. For too long, many patients with pelvic pain have undergone unsuccessful multiple referrals and treatments, with no explanation or relief of their symptoms. Too often, doctors have suggested psychological diagnoses and referral for no reason other than they cannot relieve the pain, leaving the patient confused, distressed and misunderstood.

Naomi Wolf said, "Pain is real when you get other people to believe in it. If no one believes in it but you, your pain is madness or hysteria."

Women with pelvic pain are encouraged in a Cartesian model of pain by their primary care doctors, their gynaecologists and other hospital specialists. A common misconception among patients and sometimes their doctors is that pain is caused by a specific abnormality and that when this is found and repaired then their pain will cease. If only it were so simple! Yet, there should be no stigma that psychological processes are involved in the origin and maintenance of pain, especially pain that impacts so intently on sexual functioning and identity.

The influence of psychological factors on the experience of pain needs to be explained early on in the consultation process. Recognizing the importance of the personal meaning of experienced symptoms and how these appraisals dramatically influence suffering and distress is crucial. Encouraging the patient to take an active role in the management of her pain early on reinforces the message that there is often not a simple cure for chronic pelvic pain. This is likely to be more acceptable to a patient if it comes from her doctor rather than a psychologist at a later date.

The similarities between chronic pelvic pain syndrome in men and women have led to a reappraisal of the basic neurophysiological pro-

cesses that may be operating. In the last 10 years, pelvic pain in women has been an area of increasing research and investigation. This has led to intense debate regarding the diagnosis and best management of pelvic pain.

Urologists are now increasingly perplexed by chronic pelvic pain in men and interested in utilizing multidisciplinary assessment and management. Lessons learned from the management of pelvic pain in women should be heeded and we should ensure that the same mistakes are not repeated in men. Improved liaison between the specialties and organizations involved will assist us all in greater awareness and understanding of the similarities and the differences in these conditions.

However, before we become too complacent, let us remember that we still do not know the cause or the cure for many of the chronic pelvic pain problems in women. There are few randomized trials in this complex area and there is a significant amount of work to do to solve these questions. The IPPS is well placed to coordinate multicentre research using common diagnostic tools and treatment algorithms. This research is needed to investigate not only the surgical but also the common pharmacological treatments.

I should like to thank the IPPS for giving me the opportunity to meet and enjoy the company of other clinicians who work in pelvic pain. I am honored to be your president for this year. Working together can only improve the management of this most difficult and complex condition.

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