Observations on the Transgluteal Decompression of the Pudendal Nerve

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Pudendal neuralgia, the Alcock Canal Syndrome, Pudendal canal syndrome, Pudendal nerve entrapment.

We prefer the term neuralgia rather than pudendal nerve entrapment because so many of our patients have relief following self-care or pudendal nerve blocks (see treatment below). Entrapment can only be observed at surgery.

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<th>Definition: Pudendal neuralgia</th>
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<td>- perineal and other pelvic pain that is aggravated by sitting and reduced or relieved by sitting on a toilet seat.</td>
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<td>- The “pudendal territory” is extensive and may include suprapubic, inguinal, genital and perineal pain, vulvodynia, coccydynia, and proctalgia (proctitis fugax).</td>
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<td>- Bladder, bowel, and sexual dysfunction are common</td>
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Pathophysiology and variations in symptoms.

Pudendal neuropathy is a functional entrapment where pain occurs during a compression or stretch maneuver. Causes include: cycling, fitness exercises; stretch due to constipation and childbirth; youthful sports, falls onto the buttocks; iatrogenic neuropathy (vaginal surgery, suture entrapment) and pelvic radiation. Central sensitization plays an important role in aggravation and maintenance of symptoms in many patients. Evidence of central sensitization (spinal cord wind-up) includes aggravation of pelvic pains follows sexual arousal (e.g. reading a sexually explicit novel); foreign body sensation in the rectum, vagina, urethra, or perineum is frequent. Sensations include a golf ball, a red-hot bowling ball, a pine cone, a fist, or even a stovepipe. The size of the object varies with intensity of the pain and disappears following successful treatment of neuropathy. Sacral cord neuroplasticity cause pains in the calf, and the dorsum, arch, and toes of the feet that are aggravated during pain flares and eliminated after treatment.
Evaluation – Physical Examination:

Physical examination: Observe for skin changes at the natal cleft. Pinprick sensation is tested at each branch bilaterally. Pressure on the nerve at the pudendal canal and medial to the ischial spine may reproduce pain, bladder or rectal symptoms; the Valleix phenomenon.

**Concurrent neuropathies** that affect pudendal neuropathy include the
- Back mouse or episacroiliac lipoma (middle cluneal neuropathy)
- Ilioinguinal and iliohypogastric neuropathies (vide infra)
- Abdominal cutaneous nerve entrapment.

We evaluate all males for inflammatory prostatitis.

Evaluation – Neurophysiologic

1. Quantitative sensory test (QST), the warm detection threshold (WDT) is a highly sensitive test for pudendal neuropathy in our hands. We use the NTE-2A Thermosensory Tester (Physitemp, Inc., Clifton, New Jersey, USA) following a stepping algorithm. The small diameter (0.79 cm²) of the thermal probe probably provides more accurate threshold measurements than the large Medoc thermal probe (4cm²). Dysesthesias may occur at normal or elevated temperatures.
2. Pudendal nerve terminal motor latency test (PNTMLT) uses the St. Mark’s surface electrode. Latency >2.2ms is abnormal. Neuritic pains after electrical stimulus for neurophysiologic testing occur in 22% of males and 37% of females in our clinic. Pain may be referred to different ipsilateral or contralateral branches of the pudendal nerve, or to the abdomen, suprapubic region, or feet. Bladder warmth, spasms, or urge to void may also occur with the test stimuli.

Imaging:
- MRI of the lumbosacral spine and lumbosacral plexus. Abnormalities are rare. (Tarlov cysts, are not the basis of patients’ complaints in our practice).
- Magnetic resonance neurography requires further study.

Treatment

A sequential treatment program is used, progressing only as necessary.
1. Self-care (nerve protection)
2. Pudendal nerve perineural injections (PNPI)
3. Surgical decompression.

Self-Care

Using Robert’s observation that sitting on a toilet seat relieves pains of pudendal neuralgia, patients avoid sitting. A “perineal suspension pad” supports the ischial tuberosities and suspends the perineum.
They avoid activities that cause and aggravate pudendal neuralgia such as cycling, hip flexion activities including leg presses, Stairmaster®, ab-crunches, jogging, rollerblading, etc. Medications can include amitriptyline 10 mg at h.s., increasing every five days to a maximum of 50 mg, adjusting the dosage for side effects. Almost all patients experience some relief. Cure of pain and interstitial cystitis and dyspareunia for over five years has followed self-care. Some patients return to jogging and cycling, using a hornless saddle.

Hornless saddle
**Pudendal Nerve Perineal Injections (PNPI)**

Several authors describe the use of pudendal blocks to relieve chronic, non-malignant pelvic pain. We use the technique of Bensignor, giving a series of three, monthly, transgluteal, pudendal nerve perineural injections (PNPI) of bupivacaine 0.25%, 6 ml, and triamcinolone 40 mg, 1 ml. Perineural anesthesia may be diagnostic or therapeutic. Two PNPI are given into the interligamentary space at ischial spine and one is given into the pudendal canal.

Two hours after injection, examination of six sites with pinprick detects analgesia or hypalgesia (clitoris [glans], labia [posterior scrotum], or perianal area, bilaterally). Injections may be guided by palpation, fluoroscopy, EMG stimulation ultrasound, or CT guidance. Complete pudendal anesthesia correlates with a good therapeutic response. Our patients monitor symptom indices weekly for 14 weeks.

3. Results:

- Symptom relief after PNPI may last hours, days, or weeks. They may completely resolve after one, two, or three PNPI. Bensignor indicated control of neuralgia in 70% of patients at six months. Amarenco reported a 15% response at 12 months. One of our early patients continues to have durable relief for over four years including relief of serious pain, urinary retention, and erectile dysfunction.

- Symptom changes include improved erections, decrease of pain following ejaculation, increased vaginal lubrication, pain free intercourse, improved orgasms, improved defecation, and other subtle improvements. One group with persistent pain is a subset of patients, with previous pelvic surgery complicated by urine leakage.

- Injections into the Alcock may not anesthetize the inferior anal nerve because that branch exits the main trunk proximal to the Alcock canal in 50% of cadavers.

- PNPI can be repeated and we have successful responses two years after the second series.

4. Complications of PNPI are infrequent and include pain ‘flares’ that may last several days, bleeding through the needle requires repositioning of the needle, sciatic nerves anesthesia may cause transient gait disturbance. Penetration of the pudendal nerve by the needle apparently occurred in three of our patients causing significant aggravation of pudendal pain requiring up to three months for pain resolution. Incontinence of urine or flatus may occur for one or two hours after PNPI.

**Decompression Surgery with Transposition of the Pudendal Nerve**

Over one third of patients with pudendal neuropathy in our practice will require surgical decompression. Robert outlined the surgical anatomy of a transgluteal approach. We feel that the transgluteal approach is advantageous because it permits direct visualization of the entire nerve with access distally into the pudendal canal. We often find anatomical findings that may be inaccessible via other approaches, including multiple variations in the sacrospinous ligaments, “tethering” of the nerve at the supralateral margin of the ischial spine, penetration of the sacrospinous ligament by nerve branches, fascial bands
penetrating and traversing the nerve. The inferior anal branch often leaves main pudendal trunk prior to pudendal canal.

**Technique:**
- Oblique incision is made between the sacral margin and the ischial tuberosity. Gluteal fascia is opened. Muscle bundles are separated to expose the sacrotuberous ligament.
- The sacrotuberous ligament is opened along its longitudinal axis. An Omni Tract retractor (Minnesota Scientific, Inc., St. Paul, MN) improves access to the pudendal nerve and the sacrospinous ligament. **We do not transect the sacrotuberous ligament.** This restricts the superior access. Dr. Hibner in Phoenix, USA transects the ligament but repairs it with cadaver Achilles tendon.
- Identify nerve and elevate with a vessel loop. Many nerve variations are observed. Dissection proceeds cranially, identifying and transecting any fascial structures compressing the nerve.
- The sacrospinous ligament is a highly variable structure with varying composition of fibrous bands, sheets of fascia, interspersed muscle bundles, and connections to the sacrotuberous ligament. It is transected. This releases the nerve and permits transposition anteriorly and medially. Fibers of coccygeous muscle are separated from the ischial spine to permit transposition of the nerve.
- Proceeding distally, the Alcock Canal is opened. Any adhesions or perineural fibrosis are released. An adhesion barrier anterior and posterior to the nerve to minimize postoperative perineural scarring. A suction drain is brought through a separate stab wound. The sacrotuberous ligaments and gluteus fascia are approximated.

The patient stands on the evening of surgery and ambulates the following day. Hospitalization requires two days.
- Postoperative “gliding exercise”. The hip is flexed and rotated laterally and medially, twice, bilaterally. Exercise is repeated twice daily for one to two years.
- Continue to use the perineal suspension pad.

Return to work varies from 10 days to three months. Some patients remain permanently disabled.

**Surgical success:**
We do not have cumulative data available for this report. Follow up of patients operated at the Center for Urologic and Pelvic Pain in 2004 demonstrates that the average of symptom scores becomes normal at 18 months postoperatively. Complete symptomatic cure of bladder, bowel, and sexual dysfunctions may occur. In a controlled study, Robert showed durable improvement continued for four years in nine of 12 cases. Unoperated controls were unimproved at one year.

**Surgical Complications:**
Urine retention occurs in approximately 5% of men and women, requiring in-and-out catheterization. Wound complications are infrequent. Pneumonia occurred in one female. Neuropraxia may require several days to several weeks to completely resolve. Pelvic instability is a potential problem if the sacrotuberous ligament is transected.
Failure of Surgical Intervention
Thirty to 40% of patients fail to have significant relief following surgical intervention. We have one patient who became pain free five years after surgery. Prolonged and severe pre-operative symptoms and failure of pain control using PNPI are associated with poor surgical results. Patients in whom the nerve is observed to be atrophied or discolored have poor pain relief. Unilateral surgery may require a later contralateral procedure to control symptoms. Other neuropathies can maintain symptoms, including ilioinguinal and iliohypogastric neuropathies, abdominal cutaneous nerve entrapment, and middle cluneal neuropathy, usually associated with a back mouse or episacroiliac lipoma. Sympathetically maintained pain may be a factor. Premature return to overenthusiastic exercise will hinder pain relief.

Treatment of Postoperative Failures
Bensignor in Nantes used pudendal nerve blocks as soon as two months after surgery. He recommended infusions of ketamine and clonazepam via epidural catheter for five days or hypogastric plexus blocks for sympathetically maintained pain.

We treat failures from several surgical venues using perineural blocks of bupivacaine and heparin 4000 units with 0.8 ml of NaHCO₃. Six weekly injections are given, followed by gradual increase of the interval. Dense scar softens after repeated injections. Pain, sexual, bowel, and bladder symptoms may resolve after one or two blocks.

Some clinicians use Botox injections into the obturator internus muscle, bilateral sacral nerve root stimulation (Popney, Houston, USA), spinal cord stimulation (Cleveland Clinic, USA). Re-operation has been performed by some surgeons.

Monitoring Treatment of Pudendal Neuralgia
We use: 1. National Institute of Health Chronic Prostatitis Symptom Index (NIH-CPSI) 2. A female modification (F-NIH-CPSI). 3. The American Urological Association Symptom Index (AUASI) measures voiding symptoms that are common in patients with pudendal neuropathy. 4. Sexual function: International Index of Erectile Function (IIEF-5) or the Female Sexual Function Index (FSFI). 5. A seven point Global Impression of Change (Very much worse, much worse, a little worse, NO CHANGE, a little better, much better, very much better).
Appendix:

NIH-Chronic Prostatitis Symptom Index (NIH-CPSI) (for males)
Center for Urologic and Pelvic Pain

Name: _________________________  Date: _____________________________

Pain or Discomfort

1. In the last week, have you experienced any pain or discomfort in the following areas?

Yes  No

a. Area between rectum and testicles (perineum) 1 0
b. Testicles 1 0
c. Tip of the penis (not related to urination) 1 0
d. Below your waist, in your pubic or bladder area 1 0
e. or rectal area 1 0

2. In the last week, have you experienced:

Yes  No

a. Pain or burning during urination? 1 0
b. Pain or discomfort during or after sexual climax (ejaculation)? 1 0

3. How often have you had pain or discomfort in any of these areas over the last week?

0 Never
1 Rarely
2 Sometimes
3 Often
4 Usually
5 Always

4. Which number best describes your AVERAGE pain or discomfort on the days that you had it over the last week?

0 1 2 3 4 5 6 7 8 9 10
NO PAIN Pain as bad as you can imagine

Urination

5. How often have you had a sensation of not emptying your bladder completely after you finished urinating over the last week?

0 Not at all
1 Less than 1 time in 5
2 Less than half the time
3 About half the time
4 More than half the time
5 Almost always

6. How often have you had to urinate again less than two hours after you finished urinating, over the last week?

0 Not at all
1 Less than 1 time in 5
2 Less than half the time
3 About half the time
4 More than half the time
5 Almost always

Impact of Symptoms

7. How much have your symptoms kept you from doing the kinds of things you would usually do, over the last week?

0 None
1 Only a little
2 Some
3 A lot

8. How much did you think about your symptoms, over the last week?

0 None
1 Only a little
2 Some
3 A lot

Quality of Life

9. If you were to spend the rest of your life with your symptoms just the way they have been during the last week, how would you feel about that?

0 Delighted
1 Pleased
2 Mostly satisfied
3 Mixed (about equally satisfied and dissatisfied)
4 Mostly dissatisfied
5 Unhappy
6 Terrible

Scoring the NIH-Chronic Prostatitis Symptom Index Domains

Pain: Total of items 1a, 1b, 1c, 1d, 2a, 2b, 3, and 4 =

Urinary Symptoms: Total of items 5 and 6 =

Quality of Life & Impact: Total of items 7, 8, and 9 =

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