Pudendal Neuropathy: Diagnosis

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ICS Glasgow August 2011

Supported by the Pudendal Neuralgia Foundation
Diagnosis of pudendal neuropathy can be quite easy
Two diagnostic tools are necessary.

• Think of the possibility of neuropathic causes of pelvic pain.
  Cerebrum. (Awareness).

• Use proper test equipment.
  Safety pin.
Neuropathic pelvic pain is complex.

• The receptive fields of the multiple pelvic sensory nerves overlap.

• The ‘territory’ of the pudendal nerve is highly variable.
  – Anatomical displacement of the ventral axial line results in unusual sites of pudendal pain complaints.

• PN is a mixed nerve and is not damaged uniformly so a wide variety of symptoms is possible.

• Central sensitization has great impact on symptoms.
Diagnosis of pudendal neuropathy can be quite easy

- Office physical examination
  92% have a positive diagnosis of pudendal neuropathy.

- Addition of two simple office neurophysiological tests increases diagnostic accuracy to 100%.
CPP: Is there really a simple answer? Yes...perhaps, but there are additional considerations.

- 64% have secondary neuropathic pain generators
- 58% have voiding complaints
Secondary peripheral neuropathies (Pain generators)

• Maigne syndrome (posterior ramus syndrome or thoracolumbar junction syndrome)
• Ilioinguinal and iliohypogastric neuropathies
• Abdominal cutaneous nerve entrapment
• Middle cluneal neuropathy
• Perineal branch of posterior femoral cutaneous nerve.
Is pelvic surgery the simple answer?

- Lady from Minnesota; n=11
- Lady from Minnesota, para 0-0-0; n= 4 laparoscopies + hysterectomy
- Lady from Wisconsin; n=11; 5 laparoscopies, 6 open procedures
- Lady from Wisconsin; n=16
- Lady from California; n=17
- Man from Wisconsin; n=4, including orchiectomy

- All had PN and at least one additional pelvic neuropathic pain generator.

- Practitioners must suspect a neuropathic basis rather than a morphologic or bacteriologic cause.
Monitor treatment with Symptom Scores

(Extremely helpful)

NIH-CPSI = National Institutes of Health-Chronic Prostatitis Symptom Index (also female version).

AUASI = American Urological Association Symptom Index (International Prostate Symptom Score)

A newer version, useful in both genders is available.

*Genitourinary pain index (GUPI)*

*Urology 2009;74:878-9.*
Scores permit a rapid overview of individual patient’s treatment response (72 months).

42 year old female; nerve protection only + amitriptyline 40 mg @ HS.
Multiple, repetitive stimuli “agitate” the spinal cord neurons. Progressively smaller stimuli cause disproportionate, larger responses. Central sensitization occurs.
“Central sensitization”

Ice coating is analogous to central sensitization.

On icy roads minor driving errors cause problems.

In central sensitization the nervous system responds in unusual and unpredictable ways to minor stimuli.
Central sensitization

- Does sexual arousal aggravate your pelvic pain?
- Does orgasm or ejaculation cause pain?
- Do you have “something” in your rectum, vagina?
- Are you sitting on a rock, golf ball?
Central sensitization: pelvic foreign body sensation.

78 y/o female:
large fist; six inches up in rectum

33 year old female:
Tip of football (American) exiting from the vagina; at 20 degree angle from the right side

- Size of foreign body (pelvic, vaginal, rectal) changes with severity of pain.
Sensory examination with pinprick
The “premier” office test for pudendal neuropathy.

- Simple, inexpensive
- Minimal time
- Identifies neuropathy rapidly
- Compare to medial ... “same,” or worse (hyperalgesia), or less (hypoalgesia).
- “Asymmetric” changes are typical.
- Evaluate IRN posteriorly

Zuelzer. Berl Klin Woch 1915;52:1260
Observation of skin for neurogenic inflammation; typically @ natal cleft

Peau d’orange

Cutis anserina

Cutis reticularis

(+ match stick test)

Pudendal neuropathy is a complex regional pain syndrome
Retraction of labia: unilateral **right** perineal pain
Labial changes from excessive autonomic activity.

**Right labium contracted.**

**Hyperalgesia** to pinprick

Left labium relaxed.

Normal sensation to pinprick.
After the physical examination perform two neurophysiological tests.

1. WDT—warm detection threshold
   - NTE-2-A (Physitemp, USA)
   - Examine all six branches of pudendal nerve
   - Abnormal in 92% of patients

2. PNTMLT—pudendal nerve terminal motor latency test
   - Uses St. Mark electrode (Alpine Biomed, USA)
   - Tests the function of motor fibers
   - Electrode placed over PN at ischial spine
   - Latency >2.2ms is abnormal
   - >90% of motor fibers must be damaged for PNTMLT to be abnormal. (42% of patients).
Warm detection threshold test
Physitemp NTE 2A

• Begin at neutral temp (usually 31.5°C).
• Test at 2°C and 1°C increments. (In past I also used 4°C and 0.1°C)
  This is the stepping algorithm.
• Patient states when probe changes from neutral to the slightest bit warm.

<table>
<thead>
<tr>
<th></th>
<th>Rt</th>
<th>Left</th>
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<tbody>
<tr>
<td>Clitoris</td>
<td>&gt;43.5</td>
<td>36.5</td>
</tr>
<tr>
<td>Labium</td>
<td>&gt;43.5</td>
<td>41.2</td>
</tr>
<tr>
<td>Anus</td>
<td>&gt;43.5</td>
<td>37.4</td>
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</table>
In this patient, Warm Detection Threshold Test demonstrates **central sensitization**

<table>
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<tr>
<td></td>
<td>Felt pain in RLQ</td>
<td>Felt pain in LLQ</td>
</tr>
<tr>
<td>Anus</td>
<td>&gt;43.5</td>
<td>37.4</td>
</tr>
<tr>
<td></td>
<td>Felt pain in toes of <strong>left foot</strong></td>
<td>Felt pain in toes of <strong>right foot</strong></td>
</tr>
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38 year old woman; pudendal neuropathy and 4 additional pelvic pain generators
Warm detection threshold is the best test to confirm pudendal neuropathy (92% +).

• It is non-invasive

• Simple to perform

• Identifies changes in each branch of the pudendal nerve.
  – Dorsal nerve of clitoris
  – Perineal nerve
  – Inferior rectal nerve

• Stimuli can evoke responses that indicate central sensitization.
  – Warmth in bladder; urge to void
  – Pain in abdomen/foot / toe
Pudendal Nerve Terminal Motor Latency Test (PNTMLT)

Dantec Keypointe software (Medtronic)

42% abnormal PNTMLT

45% electrical stimulus reproduces symptoms

Dr. Jean Jacques Labat, Hotel Dieux, Nantes, FR

St. Mark’s electrode (Alpine Biomed)
Pudendal nerve terminal motor latency test (PNTMLT)

Average in this patient = 2.8ms (elevated). [Normal<2.2ms].

Very strong wave generated in nerve (large amplitude).
Central sensitization identified by PNTMLT

PNTMLT prolonged with poor amplitude bilaterally

Stimuli on right side caused inguinal pain.

Stimuli on left side caused pain at left ASIS.

<table>
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<tr>
<th>Pinprick</th>
<th>L</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>clitoris</td>
<td>hypalgesia</td>
<td>hypalgesia</td>
</tr>
<tr>
<td>labium</td>
<td>hypalgesia</td>
<td>Hyperalgesia</td>
</tr>
<tr>
<td>anus</td>
<td>normal</td>
<td>normal</td>
</tr>
</tbody>
</table>

Warm detection threshold normal.
Other Neurophysiological Tests are available.

- SEP-somatosensory evoked potentials
- Bulbocavernosus latency
- EMG
  - Pelvic floor
  - Anal sphincter
  - Urethral sphincter
Summary of concepts in diagnosis of PN

• **Awareness** that peripheral neuropathies cause pelvic pain
• **Ask** the “proper” questions
• **Perform consistent 9 minute examination.**
• Be alert to secondary central sensitization.
• **Objective neurophysiological testing (+/-)**
After making the diagnosis

• Have a treatment plan
  – Prevention of further nerve damage
  – Perineural blocks of local anesthetics and steroids
  – Surgical decompression

• Have a plan for treatment failures
CPP: Is there a simple answer?

• Yes...perhaps, but

• 64% of patients have secondary neuropathic pain generators
## Diagnosing secondary pelvic neuropathies

<table>
<thead>
<tr>
<th>Neuropathy</th>
<th>Evaluation</th>
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<tbody>
<tr>
<td>Maigne Syndrome (TLJ)</td>
<td>Skin rolling; flank and abdominal wall</td>
</tr>
<tr>
<td>Abdominal cutaneous nerve entrapment</td>
<td>Pressure at lateral border of rectus muscle</td>
</tr>
<tr>
<td>Ilioinguinal-iliohypogastric unilateral</td>
<td>Pressure at external inguinal ring, near pubic tubercle superior and inferior to the spermatic cord or round ligament</td>
</tr>
<tr>
<td>Ilioinguinal-iliohypogastric bilateral</td>
<td>Same</td>
</tr>
<tr>
<td>Middle cluneal neuropathy</td>
<td>Pressure medial to S-I joint over S 2-3-4</td>
</tr>
</tbody>
</table>
Secondary pelvic neuropathies in patients with pudendal neuropathy (64%)

<table>
<thead>
<tr>
<th>Neuropathy</th>
<th>Males (n=25)</th>
<th>Females (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maigne Syndrome (TLJ)</td>
<td>11.6%</td>
<td>57.6%*</td>
</tr>
<tr>
<td>Abdominal cutaneous nerve entrapment</td>
<td>5.8%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Ilioinguinal-iliohypogastric unilateral</td>
<td>35.3%*</td>
<td>11.5%</td>
</tr>
<tr>
<td>Ilioinguinal-iliohypogastric bilateral</td>
<td>23.5%</td>
<td>38.4%*</td>
</tr>
<tr>
<td>Middle cluneal neuropathy</td>
<td>35.3%</td>
<td>56%*</td>
</tr>
</tbody>
</table>
Evaluation in patients with CPP: Maigne syndrome or posterior ramus syndrome.

Gentle squeeze; roll from flank to hypochondrium.

*Painful skin rolling = posterior ramus syndrome*

Skin rolling often causes urge to void and urethral pain.

Cause: Poor posture, slouched shoulders, antalgic position

Treatment:
- Postural correction
- Subcutaneous infiltrations
- Paraspinal anesthetic blocks
Postural correction exercises for Maigne syndrome

- Stand “tall and proud” like a Scots Guard
- Wall “pushes” To extend spine and correct shoulder position
- Pillow under mid-back to extend T-L region
- Roll under vertebral column
Secondary neuropathic pelvic pain generators.

- Abdominal cutaneous nerve entrapment (ACNE)

During injection of middle site she felt a “tube of pain going to the vagina.”
Concurrent peripheral neuropathies: Evaluation 2 hours following pudendal nerve perineural injections (PNPI)

1. ACNE
   - Three tender sites left rectus border
   - T 9-10-11

2. Maigne syndrome (TLJ)
   - Painful skin rolling within dotted circle.
Ilioinguinal and iliohypogastric neuropathy
“Testis” pain persists after effective PNPI.

Note broad extent of analgesia after PNPI including dorsal nerve of penis and perineal nerve. This represents extension of the ventral axial line that is normally at the base of the penis.

Bupivacaine/lidocaine infiltrations at two sites provided complete pain relief.
Neuropathic pelvic pain: **middle cluneal neuropathy**
Back mouse (episacroiliac lipoma)

- Palpable subcutaneous lipomas
- Pressure reproduces “low back” pain. (sacral)
- Pain may radiate
  - Vagina
  - Inguinal
  - thigh
- Not sacroiliac joint pain
- Middle cluneal nerves are posterior rami S 2-3-4

Diagnosis of Pudendal Neuropathy
Summary

• Suspect PN because of patient symptoms
• Evaluate with pinprick examination
• Observe for skin changes
• (Do N-P tests if available)
• Physical exam for other pelvic neuropathic pain generators
  – Maigne syndrome
  – Ilioinguinal and iliohypogastric neuropathies
  – Abdominal cutaneous nerve entrapment
  – Middle cluneal neuropathy
  – Perineal branch of posterior femoral cutaneous nerve
WHAT ARE YOU DOING?

I'M SEEING IF I CAN READ YOUR THOUGHTS WITH MY STETHOSCOPE

YOU THINK I'M AN IDIOT, DON'T YOU?

AMAZING!