APTA CSM 2016
Pudendal Neuralgia: Then and Now
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Disclosures
● Scientific Advisory Board for Materna Medical

Objectives
1. Evolution of PN
2. Diagnosing PN
3. Differential diagnosis of PN vs PNE
4. Biopsychosocial Physical Therapy Protocol
5. Case Study
6. Interdisciplinary Treatment Algorithm

Pudendal Neuralgia: Then
1988: Alcock’s Canal Syndrome and Perineal Neuralgia
   • Compression of the PN, canal syndrome
   • Tinel’s sign of increased pain with sitting
   • Cyclist’s Syndrome

Diagnosis of PN by PNE Then: tunnel syndrome due to ligamentous entrapment of the PN:
   • (+) Tinel’s Sign
   • “Muscular dysfunction” of the external pelvic girdle muscles
   • Pelvic floor muscle examination not included

Diagnosis of PN by PNE Then: tunnel syndrome due to ligamentous entrapment of the PN:
   • Further Examination:
     • Diagnostic Pudendal Nerve Block
     • Pudendal Nerve Terminal Motor Latency Test
     • Sacral Reflex testing
     • EMG: bulbocavernous and external anal sphincter, comparative analysis
Then: Pudendal Neuralgia/Pudendal Nerve Entrapment

- **Treatment**
  - 3 Pudendal nerve infiltrations: 4ml of 1% lidocaine and 40 mg methylprednisolone acetate
  - Functional restoration physical therapy optional: muscle stretches and biofeedback/relaxation
  - Surgical decompression

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**Patients 18-70, perineal pain, (+) temporary response to block**

**Surgical Group**
- N= 16
- Surgical decompression and transposition
- Medical management: anticonvulsants and antidepressants
- PNBs
- Relaxation Therapy

**Nonsurgical Group**
- N= 16
- Medical management: anticonvulsants and antidepressants
- PNBs
- Relaxation Therapy

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**Results**

**Table 3. Primary endpoint, 3 months.**

<table>
<thead>
<tr>
<th></th>
<th>Intent to treat, n (%) (n = 32)</th>
<th>Per protocol, n (%) (n = 29)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Success</td>
<td>Failure</td>
</tr>
<tr>
<td>Surgery</td>
<td>8 (50.0)</td>
<td>8 (57.1)</td>
</tr>
<tr>
<td>Control</td>
<td>1 (6.2)</td>
<td>15 (93.8)</td>
</tr>
<tr>
<td>Fisher exact test</td>
<td>0.0155</td>
<td></td>
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**Conclusions**

“This prospective, randomized study demonstrates PN surgical decompression/transposition is a safe and effective treatment for patients with intractable PN”.

“This pain may be due to a tunnel syndrome previously misdiagnosed or abusively qualified as ‘idiopathic’.”
As the pelvis turns….

Lefaucheur et al. What is the place of ENMG studies in the Dx and Management of PN related to entrapment syndrome? Neurophysiologie Clinique/Clinical Neurophysiology (2007) 37, 223 -228

“Entrapment of the pudendal nerve may be at the origin of chronic perineal pain. This syndrome must be diagnosed because this can result in the indication of surgical decompression of the entrapped nerve for pain relief.”

Lefaucheur et al. What is the place of ENMG studies in the Dx and Management of PN related to entrapment syndrome? Neurophysiologie Clinique/Clinical Neurophysiology (2007) 37, 223 -228

Diagnostic Criteria for Pudendal Neuralgia by Pudendal Nerve Entrapment (Nantes Criteria)

- Pain in the territory of the PN
- Pain predominantly while sitting
- Pain does not wake patient at night
- Pain with no sensory impairment
- Pain relieved by diagnostic PNB


Diagnostic Criteria for Pudendal Neuralgia by Pudendal Nerve Entrapment (Nantes Criteria)

- absence of pathognomic imaging, laboratory and electrophysiologic criteria, remains primarily clinical
- "In fact, only the operative finding of nerve entrapment and post-operative pain relief can formally confirm the diagnosis of PN due to PNE, except for a possible placebo effect of surgery".


Pudendal Neuralgia Diagnosis Now

Pudendal Neuralgia Diagnosis Now

● Pudendal Neuralgia
- vs
● Pudendal Neuropathy
- vs
● Pudendal Nerve Entrapment

Pudendal Neuralgia: Now

ENMG limitations

- Employed techniques correlate to demyelination or axonal loss vs pathophysiological mechanisms of pain
- Tests only consider direct or reflex motor function, sensory nerve conduction studies need to be more sensitive to detect nerve compression
- Cannot differentiate entrapment from other nerve issues
- ENMG limited sensitivity and specificity about pain mechanisms

Lefaucheur et al. What is the place of ENMG studies in the Dx and Management of PN related to entrapment syndrome? Neurophysiologie Clinique/Clinical Neurophysiology (2007) 37, 223 -228
Pudendal Neuralgia Now

- Neuromuscular and/or Neuropathic Pain Syndrome
- Mechanical
  - Compression
  - Tension
  - Entrapment

Pudendal Neuralgia Now Syndrome

- Neuromuscular Peripheral/nociceptive impairments
- Mechanical causes of neural issues
  - compression
  - tension
  - entrapment
  - "surgery"
  - "anatomic variation"
- Pain Component: CNS alterations
  - sensory processing disorders of the spinal cord and brain
  - pain is an output expression of the brain
  - Nociception is neither necessary nor sufficient for the production of pain

Pudendal Neuralgia

- Incidence
  - No good population based studies done
  - Estimates range from 1/2,000-1/10,000

Anatomic Variation: Then

- Variation was primarily concerned with dorsal and rectal branch and passage through Alcock’s canal
  - Inferior rectal nerve in Alcock’s Canal: 56-90%
- P Mahakkanukrauh, et al 2005
  - 37 cadavers
  - 56.2% one trunk
  - 31.5% two trunks
  - 11% rectal nerve perforated the SSL
  - 12.3% three trunks

Anatomic Variation: Now

- Perforation of sacrotuberous ligament by nerve branch
- Fixation via connective tissue on dorsal surface of SSL
- Bifurcation of nerve
- Differences in ancestry: European vs African descent
  - PN in relation to ischial spine, European closer
  - IRN more superficial in European
  - Inf rectal nerve in Alcock’s canal: 42.3%
    - closer to PFM thus increased risk for stretch injury
Gluteal and pudendal artery anatomy

Dissected left hemipelvis demonstrate the relative location of the SGA, IGA, and IPA to the lumbosacral nerves. EIV, external iliac vein; IGA, inferior gluteal artery; IPA, internal pudendal artery; L4 and L5, fourth and fifth lumbar nerves; S1-S4, first through fourth sacral nerves; SGA, superior gluteal artery.


Pudendal nerve trunk

Dissected left hemipelvises showing A, a single PN trunk and B, multiple PN trunks. Blue pin indicates the ischial spine. CSSL, coccygeus-sacrospinous ligament complex; PN, pudendal nerve.


A, The PC on the lateral wall of the left ischioanal fossa is shown. B, The PC opened to expose the PN and vessels. The asterisk indicates the medial fascia of the obturator internus muscle; the blue pin indicates the ischial spine.


A, Transection of the left CSSL complex 1 cm medial to the ischial spine (blue pin) exposes the PN and vessels on dorsal surface of SSL. Note that the PN appears fixed by connective tissue to the dorsal surface of SSL. B, Complete mobilization of the PN and vessels following further dissection from connective tissue within the PC and on the dorsal surface of the SSL.


Inferior rectal nerve course

A, The IRN emerges from the dorsal surface of the left CSSL complex and courses within the ischioanal fossa without entering the PC. B, The IRN courses through the proximal portion of the PC before exiting into the ischioanal fossa and coursing toward the anorectum.


Pudendal Neuralgia Now

- Biopsychosocial Treatment Model
- Pelvic Floor Physical therapy is considered first line therapy most pain conditions, including Pudendal Neuralgia
- Nociception and pain are not the same and must be independently evaluated and addressed

<table>
<thead>
<tr>
<th>Physical Therapy Evaluation: History</th>
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<tbody>
<tr>
<td>• etiology of chief complaints</td>
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<tr>
<td>• evidence of central sensitization</td>
</tr>
<tr>
<td>• evidence of fear-avoidance/</td>
</tr>
<tr>
<td>catastrophization</td>
</tr>
<tr>
<td>• pain, anxiety, depression</td>
</tr>
<tr>
<td>• medical professionals actively involved in their care</td>
</tr>
<tr>
<td>• failed treatments/interventions/ medications</td>
</tr>
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<thead>
<tr>
<th>Physical Therapy Evaluation: Physical Examination</th>
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<tbody>
<tr>
<td>• Pelvic floor and girdle muscles</td>
</tr>
<tr>
<td>• length, strength, motor control, MTrPs</td>
</tr>
<tr>
<td>• Connective tissue</td>
</tr>
<tr>
<td>• mobility, integrity</td>
</tr>
<tr>
<td>• Joint integrity</td>
</tr>
<tr>
<td>• static and dynamic</td>
</tr>
<tr>
<td>• Neurodynamic function</td>
</tr>
<tr>
<td>• elongate, glide, slide, irritability</td>
</tr>
<tr>
<td>• Movement patterns</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Physical Therapy Management: Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Etiology, symptoms, impairments</td>
</tr>
<tr>
<td>• Identification of nociceptive local tissue dysfunction, mobility dysfunction, strength/stability and functional limitations</td>
</tr>
<tr>
<td>• Identify central nervous system impairments</td>
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<table>
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<tr>
<th>Physical Therapy Treatment Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient education: pain education</td>
</tr>
<tr>
<td>• Neutralize fear</td>
</tr>
<tr>
<td>• Manual therapy</td>
</tr>
<tr>
<td>• Home exercise program and temporary lifestyle modification</td>
</tr>
<tr>
<td>• Coordination of care and provider communication</td>
</tr>
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<thead>
<tr>
<th>Case: Mary T</th>
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<tr>
<th>What to Expect from your Physical Therapist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explanation of cause of symptoms</td>
</tr>
<tr>
<td>2. Frequency of your treatment plan</td>
</tr>
<tr>
<td>3. Duration of your treatment plan</td>
</tr>
<tr>
<td>4. Communication with your other providers</td>
</tr>
</tbody>
</table>
Treatment Plan Troubleshooting

- Cannot tolerate physical therapy
- Not responding to physical therapy
- Noncompliant with physical therapy plan
- No access to physical therapy

Troubleshooting: Cannot tolerate physical therapy

- Manual therapy techniques incorrect
- Manual therapy techniques correct but pain is unmanaged
- Exercises to benefit one impairment aggravate another, not appropriate
- Technique or exercise not indicated because of other comorbidities (ex: vulvar tissue integrity)

Troubleshooting: cannot tolerate physical therapy

- Unmanaged pain: allodynia/hyperalgesia
- Central vs Peripheral nervous system dominance
- Manual therapy, exercise, lifestyle
- True nerve entrapment: surgical insult, anatomic abnormalities

Not responding to physical therapy

- Treatment technique efficacy
- Relevance of impairment targeted
- Touch everything, change nothing
- CNS dominant pain
- Entrapment
- Unidentified comorbidities

Non-Compliance with physical therapy

- Lack of belief in provider
- Lack of understanding of syndrome
- Unmanaged pain and/or anxiety and/or psychiatric comorbidities
Non-Compliance with physical therapy

- Cost
- Time intensive
- Convinced it is PNE

“If I cannot help you now let me help you find someone who can”

Pudendal Nerve Surgical Decompression

- How do we choose patients for surgery?
  - Patient’s meet overall diagnostic criteria
  - Failed extensive conservative treatment
  - Neuropathy
  - No other treatment options in their locality
  - Mechanism of injury acute onset of symptoms
    - Mesh, hematoma etc.
    - Meet the Nantes Criteria
    - Appears to correlate with better surgical outcomes

Pudendal Nerve Decompression

- Who might we not want to operate on?
  - Severe central sensitization
  - Significant psycho/social component
  - Diagnosis somewhat unclear
  - Failure to meet Nantes Criteria
    - The most severe cases may not meet criteria
  - Drug dependence
    - Possible narcotic hyperalgesia

Pudendal Nerve Decompression

Surgery: Then
- Transperineal (TP)
  - Shafik, Beco
- Trans-ischiorectal (TIR)
  - Bautrant
- Transgluteal (TG)
  - Robert

Pudendal Nerve Decompression

Surgery: Now
- Trans-ischiorectal (TIR)
  - Bautrant
- Transgluteal (TG)
  - Robert, Conway, Hibner, Filler
    - variations
- Anterior Approach
  - Dellon
- Laparoscopic
  - Erdogru
**Transgluteal**
- Classic procedure
  - Split gluteus maximus
  - Section the STL
  - Complete neurolysis
  - Section the SSL
  - Transpose nerve in front of the ischial spine
    - Issues with pelvic stability, scar tissue formation

**Transgluteal: Now**
- Modifications
  - Split the STL to preserve it
  - Section STL with repair
  - Intra op NIMS
  - Adhesion barriers
  - Pain pumps
    - Minimally Invasive
Anterior Approach: Dorsal Branch

- Lee Dellon, MD

Pudendal Nerve Decompression

- Now no need to travel to Europe for procedure
- No RCTs comparing the different techniques
  - overall 40-50% cured or nearly cured
    - 20-30% improved
    - 20-30% no change

Post-Op PN Decompression

- Very light activity for 4-6 weeks
- Gradually increase activity as tolerated
- Continue all supportive treatments
  - PT, Interventional Pain Management
  - PT within approx 8-12 wks
- Maximal recovery may take up to 2 years especially in severe cases
Case Study #2

- 34 yof G0P0
- Current % tailbone pain upon sitting >30 min w/o cushion, 1-2 hrs with cushion, mild discomfort with penetration during intercourse and with orgasm
- Urinary: WNL
- Bowel: very occ discomfort with BM, h/o IBS-c
- S/p B pudendal nerve decompression 1.5 yrs ago

Case Study #2

- H/o pelvic pain since 2004
  - Burning, lancinating pain in vagina
- Exacerbation of sx's in 2008 with UTI
  - + urinary urg/freq with - culture
  - Dx with IBS-c
  - Rectal pain
  - Pain upon penetration and deep thrusting
  - Orgasm difficult to achieve, painful
  - Pain immediately upon sitting, toilet seat best
  - Pain post BM

Treatments prior to PN decompression
- Series of PNB: no relief
- Medical therapy: min relief
- Pelvic physical therapy: min relief
- Dx deep gluteal syndrome and piriformis pudendal syndrome with recommendation of piriformis resection
- 2013 surgical piriformis release: min relief

Post B trans-gluteal PN decompression
- Urinary urg/freq sig reduced
- Min urethral irritation seemingly diet related
- BM WNL, min occ constipation
- Pain upon penetration sig reduced, orgasm much easier to achieve, mild discomfort post intercourse and orgasm
- 1 yr post decompression developed tailbone pain with sitting

Objective Findings
- Min CT dysfunction buttocks, post thigh
- Poor scar mobility R buttock
- MTrPs B glut med, min, piriformis
- Mod + R>L hypertonus B levator ani, coccygeus, obt int, piriformis
- No PN sensitivity

Treatment
- Scar mobilization
- MFR, manual MTrP release
- Dry needling
- Internal MFR per vagina, anus
- HEP: pelvic floor drops
Pudendal Neualgia Now

- Biopsychosocial treatment approach
- Interdisciplinary plan of care
- Algorithm for troubleshooting

Interdisciplinary Treatment Algorithm

Questions?
Thank-you!
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Elizabeth@pelvicpainrehab.com

Sited References
- Lefaucheur et al. What is the place of ENMG studies in the Dx and Management of PN related to entrapment syndrome? Neurophysiologie Clinque/Clinical Neurophysiology (2007) 37, 223 -228

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- M.D. Barber, R.E. Bremer, K.B. Thor, P.C. Dolber, T.J.

Sited References
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