NERVE ENTRAPMENT SYNDROMES [ NES ]

Disorders of peripheral nerve with pain and/or loss of function [ motor and/or sensory] due to chronic compression.

e.g., carpal tunnel syndrome
IMPORTANT: Memorize completely!!

- **Upper limb**

- **Nerve place usually referred to** median
  - carpal tunnel carpal tunnel syndrome
  - median (anterior interosseous) proximal forearm anterior interosseous
  - Median pronator teres pronator teres syndrome
  - Median ligament of Struthers ligament of Struthers syn
  - Ulnar cubital tunnel cubital tunnel syndrome
  - Ulnar Guyon's canal Guyon's canal syndrome
  - radial axilla radial nerve compression
  - radial spiral groove radial nerve compression
  - radial (posterior interosseous) proximal forearm posterior interosseous nerve radial (superficial radial) distal forearm Wartenberg's Syndrome
  - suprascapular suprascapular notch etc
  - Etc etc
  - ETC ETC ETC
**NES**

- **Def:** results from chronic injury to nerve as it travels through an osseoligamentous structure, or between muscles bundles
- May have an underlying developmental anomaly or variant
- Repetitive motion slaps, rubs, compresses the n.
- Relatively common
- Often seen in athletes, younger patients
Chronic NES

- Repetitive injury may lead to edema, ischemia, and finally alteration to the nerve sheath, even demyelination.
- Eventually complete recovery may not be possible, and there is also the potential for ‘phantom limb’ type symptoms that become centralized in the brain and ‘replay’ even after the pathology is fixed.
- Early recognition and intervention is critical.
PUDENDAL NERVE ENTRAPMENT

■ PN is the main nerve of the perineum;
■ Carries sensation from the external genitalia, skin around the anus, scrotum, perineum.
■ Motor supply to pelvic muscles, external urethral sphincter, and ext anal sphincter
■ Originates from sacral plexus [occasionally from sciatic n. instead ]
PNE SYMPTOMS

- Pain in the lower central pelvis can include anus, perineum, scrotum, penis, testicles, vulva
- Burning pain, sometimes shock-like
- May be unilateral or bilateral
- Deep ache, ‘severe like toothache’
- Hypersensitivity to touch, pressure
- Often provoked with urination / defecation, exacerbated by sitting
- Often cannot sit; sexual dysfunction common
- Urinary urgency, dysuria, feeling of ‘always needing to go’
PUDENDAL N.

- COURSE:
PN

- Landmarks:
PUEDENDAL NERVE ENTRAPMENT [ PNE ]
PNE
That Nasty Pudendal Nerve :(

Forum: 2011 Playroom
Chat with other moms of babies born in 2011.
Hosts: ? and ?

Welcome to the JustMommies Message Boards.
We pride ourselves on having the friendliest and most welcoming forums for moms and moms to be! Please take a moment and register for free so you can be a part of our growing community of mothers. If you have any problems registering please drop an email to boards@justmommies.com.
PNE

- "The main daily activities requiring the seated position (work, meals, driving, theaters, etc) are no longer available to these patients, whose mental attitude is one of chronic pain sufferers so obsessed with their miserable state as to be rapidly regarded by their doctors as psychiatric cases."
- Patients often have to sit on an inflatable ‘donut’ to sit at all
- The variety of symptoms often mean the patient has seen urologist, gynecologist, proctologist, gastroenterologists etc
PNE

- Often seen in athletes: bicyclists, cross country skiers, skaters, dancers, some runners.
- May begin after direct trauma, after pelvic surgery, or after child birth.
- Or may have no known precipitating event
- Early dx and rx offer much better prognosis
PNE

- First line rx (early cases): NSAIDs, i.e. ibuprofen; topical pain relievers [lidoderm creams, creams with capsaicin]
- Try to identify and avoid activity that causes the pain
- Hot or cold compresses [can alternate]
- Key is to suspect the diagnosis and sort it out from other causes
- Pain may be provoked by ‘skin rolling’ technique or direct pressure on ischial tuberosity
PNE

- Physical rx: some know specialized techniques
- Lengthen and loosen pelvic floor – buttocks, thighs, hips, perineum
- Toe touches, supine leg lifts, side leg raises, range of motion ex in swimming pool
- Next line of approach: meds i.e. elavil, neurontin, valproate BUT direct intervention may be better
PNE injections

- The pudendal nerve can be approached very precisely via CT scan direction.
- Current national recommendations are for this approach—reliable results vs. flouro directed.
- Injx with local anesthetic can confirm the origin of sx.
- Results of injx in past were variable to poor - current technique better results.
- Repeat injx when sx recur, often 3 x in 6-9 months.
PNE Injections

- Injection: using 5” 22 g spinal needle, initial is lidocaine 1%- this will immediately replicate/exacerbate sx
- Additionally, dexamathosone phosphate 4 mg is intermixed with 3 cc 0.5 % bupivicaine
- Hyaluronidase 300-600 units- hydrolyzes glucosaminic bonds between hyaluronic acid, a major intercellular substance- this helps remove barriers between tissues/cells- fluids, including other meds, penetrate better- helps disrupt scarring and reduces density of any new adhesions
- Heparin 8000-10000 units- was discovered to inhibit superficial scar formation in burn patients following debridements.
- BotulinumToxin A [Botox] also can be used if the above fails.
- Surgery for failed cases: send to the experts such as Dr. Stanley Antolak
PIRIFORMIS SYNDROME  
[ PS ]

- Caused by piriformis muscle compressing the sciatic nerve— a true sciatica in that sense
- Piriformis m. is a stabilizer of hip, and lifts and rotates thigh away from body
- Usually pain and tingling in buttocks, often tenderness, and subsequently pain extends down the thigh
- Increased by sitting, walking, running, climbing stairs, direct compression.
Is it nerve root compression (radiculitis) or nerve compression (neuritis)?

Nerve roots

Piriformis muscle

Sciatic nerve
Athletes, runners esp. distance runners, sometimes with trauma
Can be related to developmental anomaly
Similar symptoms can be produced by lumbar disc disease, sacroiliac joint disease, and a few others.
May be necessary to image spine and pelvis is dx is not clear
Some articles show many patients with ‘sciatica’ and negative lumbar MRI have piriformis syn
PS
Contributing factors

- Hyperlordosis
- Muscle anomalies
- Muscle hypertrophy
- Fibrosis due to trauma
- Anatomical nerve abnormalities
- Occasionally due to physical hyperactivity, hip replacement surgery, leg length discrepancy
PS

- Accessory fibers and enlargement at origin on right
Accessory bundle of *piriformis* on right
PS RX:
First line

- Best and safest is care that you provide - massage, joint manipulation and mobilization, stretching, isotonics, weight bearing
- Heat therapy, at home, or better with ultrasonographic rx.
- Stretching piriformis, external rotators of hip, and adductors
PS RX

Second line

- Refractory cases often benefit from direct intervention
- Injection performed with 22 g spinal needle with direct visualization with us
- Sciatic n identified and the piriformis directly overlying is entered with needle
- Injx with 5 cc 0.5% bupivicaine mixed with 40-80 mg triamcinolone, repeat x 2 with recurrence
- Resistant cases may get good result with same approach but with Botox
US DIRECTED RX

SCIATIC NERVE
PS INJX

RIGHT PIRIFORMIS
MERALGIA PARESTHETICA

- Entrapment of the lateral femoral cutaneous nerve
- Occurs between the anterior ‘superior iliac crest and the inguinal ligament
- Tight clothing, obesity, pregnancy, scarring, excessive walking, biking etc
- Pain may be burning, ‘electric’, stinging, sharp ‘shock’ associated with motion
- If in doubt, EMG is helpful
LFCN compression
PM RX

- Chiropractic care with pelvic mobilization, myofascial rx, transverse friction massage, and stretching may resolve this rapidly in many cases.

- Usual recommended medical care starts with “NSAIDS, looser clothing, narcotics if needed, reduced activity” !

- Resistant cases often have excellent response to injx
MP INJX

Easily done with US

Identify inguinal ligament and the LFCN

Inject 1cc 1% idocaine, followed by 3 cc 0.5% bupivicaine with 40 mg triamcinolone

80% of patients pain free with 1 week, others may require second injx.
NES around the knee

- Patient with ‘weakness’ and pain in lower leg and ankle, esp pain in foot
- Neuro exam suggested problem was common peroneal nerve
- EMG also suggestive
- MRI lower leg ordered
- Denervation of medial and lateral heads of gastrocnemius
PERONEAL NES
COMMON PERONEAL N.

- course
CP NES

- High signal intensity is seen in acute and subacute denervation
- CPN wraps around neck of fibula - a ‘tight’ area; vulnerable to trauma from fractures, surgery, repetitive stress [athletics], casts, squatting position, chronic crossing of legs, etc
- Developmental variants as well
- Most common mononeuropathy in lower leg
- RX correct cause if possible... padding, alter habits
“SPORTS HERNIA”  
ATHLETIC PUBALGIA (AP)  

- ‘Sports hernia’ is a real misnomer— not really a hernia; often seen in athletes  
- Symptoms are in the inguinal/groin area and may mimic hernia  
- Many patients have had hernia repairs, even for tiny, inconsequential hernias, and still no relief  
- True hernia— tear in abdominal wall, through which abdominal contents protrude  
- Pain and tenderness in inguinal area, esp the symphysis pubis
AP

- It does involve a tear, most commonly of the muscle attachments, specifically an aponeurosis
- An aponeurosis is a tendonous structure joining muscles and other body parts in a common structure—example plantar fascia of foot
- In AP the aponeurosis attached to the symphysis pubis is involved
- The aponeurosis of the rectus abdominis and the adductor longus of the thigh are the usual culprits
AP

- RA-AL

Rectus Abdominis

Adductor Longus
SAGITALL
Walking, running, jumping, skating, falling....there are many movements that stress these two muscles simultaneously and cause them to pull against each other at this attachment.

The aponeurosis is strong but contains very little blood supply, like many tendons, healing is poor.
AP

- sagittal
60 year old male, injured from fall on ice [hockey] several years prior, with re-injuries with ‘slipping and sliding’ several times; pain greatest on right

Pain too great for exercise now, very limited activities…. “miserable”

Had many studies and exams- not helpful

He had read about sports hernia and MRI
Sagittal left
Sagittal right
axial
axial
Like rotator cuff etc. tendons repair poorly on their own.

Initial rx: rest, ice, NSAIDS but if persists needs dx and rx.

Recently open surgery has been offered, and more preferable for athletes endoscopic surgery.

Very recently intervention with ultrasound directed injx- with steroids and anesthetic, now considered best approach before surgery.