Hypertonic Pelvic Floor Disorders: Identification and Management

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Disclosures

• Conflicts
  – Research: Taris Biomedical
  – Consultant: Medtronic, Salix
  – Speaker: Astellas, Salix, Medtronic

• Thanks to
  – My Pain Patients for teaching me how to help them
Objectives: The participant will...

• Understand how chronic pelvic pain is different than acute pain
• Learn how to identify pts. manifesting pelvic floor tension myalgia (both the primary disorder and those secondary to other pathologic states)
• Learn how to prevent and treat post-op de novo and flare of PF HT pain
• Learn how to identify and treat trigger points
Descartes Dedicated “Tubules”

MESH
Surgical Outcomes for mesh removal for pain disorders
Unger CA Int Urogyn J 2013

- Multicenter retrospective, N=30
- 63% improved
- 30% worse
- 7% no change

If nonsurgical therapy used first, surgery required in 59% but this includes complaints of erosion and pain

* Abbott S Am J Obstet Gynecol 2014
Surgical Therapy for Mesh Related Pain
Danford JM  Int. Urogyn J 2014

- N=233 pts w/ mesh related pain and surgical therapy
- 73% w/ improved pain
- 8% w/ worsened pain
- 19% w/ no change in pain

Hx of prior Chronic Pelvic Pain assoc. w/ increased risk of failure
OR .28, CI 0.12-64, P=.003
Pain Theories in Evolution

- Descartes: tissue trauma leading to alarm in the brain, for protection / warning
- Livingston (1943): Chronic irritation of sensory nerves causing chronic pain and spreading disturbances of function in both somatic and visceral structures
- Sudeck (1942): RSD / CRPS is a sympathetic hyperactivity disorder that might be provoked by an exaggerated inflammatory response
Pain Theories in Evolution

• Melzack and Wall (1965): Gate control theory: modulation by opening or closing neural gates but Melzack states that “this still does not explain certain types of pain problems”¹

• Present pain theories involve end organ pain from tissue damage, neuropathic pain arises from changes in damaged nerves, prolong peripheral inflammation and tissue damage can cause peripheral sensitization and central sensitization that then can result in persistent pain; ie visceral pain syndromes²

1 Melzack Science 1965 150:971-9
2 Butrick Clinics Ob Gyn, 2003
IBS - Sensory Sensitization

Mechanosensitive afferent

Dorsal root ganglion

Repetitive stimulation

Sensitized spinal circuits
Spinal “Wind-up”: An Example of Neuronal Plasticity

- Biology of up-regulation of sensory processing
  - Barrage of nociceptive/painful stimuli to dorsal horn
  - Prolonged release of glutamate and substance P in DH
  - Decrease threshold or loss of inhibition = Allodynia
  - NMDA receptor activation & increased excitability of large pool of internuncial neurons = Expansion of receptive fields
  - Based on duration and severity, these biochemical changes can become permanent = Central Sensitization
  - Exaggerated reflex output with end organ dysfunction / muscle spasticity and spontaneous firing of DH neurons
Sensitization or Up-regulation of Sensory Processing

Pain sensation

Hyperalgesia

Insult

Allodynia

Normal

Stimulus Intensity

Innocuous

Noxious

Stimulus Intensity
Visceral “Silent” Afferents

- Thinly or unmyelinated – easily damaged locally
- All can transmit pain – yet most are silent
  - 10% afferents are silent in skin
  - 30% – 80% visceral afferents are silent
- Silent afferents become active with prolonged stimulation
- Silent afferents play major role in tissue sensitization
- Many more interneuronal synapses
- The bladder has the highest neural density and the highest proportion of “silent” c-fibers of any viscera*

Neuropathic States Commonly seen with VP Syndromes

• Visceral Hyperalgesia
  – Visceral Sensitization e.g. IBS, IC
• Viscero-somatic Hyperalgesia
  – Referral Neurogenic Inflammation e.g. IC with vulvodynia, dysmenorrhea / CPP with TP
• Viscero-visceral Hyperalgesia
  – Referral Sensitization to second viscera e.g. IC with IBS, endometriosis with IC
• Viscero-Muscular Reflex
• Viscero-somatic Convergence
  – Referral Pain without hyperalgesia, not neuropathic eg MI and left arm pain
Prolonged Noxious Stimuli

Dorsal Horn Up-regulation and Central Sensitization

Sensory Processing Abnormalities

Neuropathic Responses

New Pain Generators e.g. PFTM, IC/IBS, Vulvodynia

Self-Perpetuating

Self-Perpetuating
Pelvic Floor Dysfunction:

Weak Pelvic Floor
- Pelvic organ prolapse
- Incontinence: urinary & fecal (stress, urge, mixed)

- 13 million adults in the US
- 12.4 billion cost (Jama 2003)
- 38% of women experience SUI, 28% of athletes between 18 to 21 yrs of age. (Ashton-Miller et al. 2001)

HYPOTONICITY!

HT PF dysfunction can involve many pts with POP, U/F, voiding dysfunction, obst. defecatory problems, IC/PBS, rUTIs

Myofascial pain is seen as a component of pain in pts with ANY type of CPP yet is rarely ID'd or treated (39% of all women have PP at least some of the time)

HYPERTONICITY!

Active Trigger points!

50% to 85% of pts w/ CPP have PFTM as a component of their pain

HYPOTONICITY!

HYPERTONICITY
Myofascial Pain Syndrome

- MPS is the most common cause of chronic low back, shoulder or neck pain
- 30% - 50% of individuals have latent or active trigger points
- MPS is one of the most frequent causes of chronic disabling pain
- Primary fibromyalgia can be differentiated from MPS by its wide spread distribution but 40% of FM pts have PF HT disorders
CARNETT TEST
CARNETT TEST

- **POSITIVE** = Pain worse or the same means ABDOMINAL WALL PAIN
- **NEGATIVE** = Pain is less means PAIN FROM VISCERA

Trigger points can be primary to Abd Wall or secondary from PF myofascial pain
Abdominal Wall Trigger Point Injections

- Commonly located above and near lateral border of Pfannenstiel incision
- 5-10 cc. of 1/2% marcaine with 21 gauge needle
- Reevaluate in 3 - 5 days: good response represents pain relief beyond pharmacologic benefits
- Repeat injection with or without 10 mg triamcinolone
- 3 - 5 injections typical course (referral TP?)
Why the pelvic floor?

• Called upon in all aspects of life.
• When we hold in urine, gas or stool we ask for continuous control for hours yet they must relax to allow for normal voiding at a moment’s notice.
• When we stand, we require that these m’s fight gravity. When we sit, we sit on them. When we walk, these m’s engage with other core m’s to maintain stability of the pelvic girdle.
• Easily traumatized.
• Emotions held here.
Why is Muscle Pain So Important?

- Hypertonic, myofascial pain of the PF musculature is the most common component of all causes of PP and triggers many of the PF disorders we treat every day
  - Voiding dysfunction (leads to rUTIs and IC)
  - Obstructed defecation (leads to POP)
  - Urinary urgency / frequency
  - Dyspareunia / Vulvodynia
- HT PF dysfunction and pain tends to persist after removal of the original trigger
- Recurrence triggered by stress, orthopedic problems, sleep disorders and SURGERY
Etiology of PFTM

Injuries to the pelvic floor

Dysbehaviors of the pelvic floor

Biomechanical dysfunction

Inflammatory pain disorders involving pelvic viscera

IC, IBS, Endo

Bed Wetting
Ped Elim Disorders
Ureteral reflux
Holding Patterns

Short leg syndrome
Positional stress
Orthopedic triggers
Etiology of PFTM: Injuries

- Pelvic surgery
- MVA
- Falls
- Straddle injury
- Vaginal delivery
Levator Injuries as Documented by MRI

• MRI defects:
  – Not seen in nulliparous pts
  – 20% of primiparous pts
  – 50% of pts delivered by forceps
  – 23% of pts delivered by vacuum
  – 7% of pts who experienced spontaneous delivery

Therefore myofascial injury must be considered in any pt. with postpartum PPS
Mechanisms of Injury
Pelvic Floor Dysbehaviors

Acute Injury
- Levator injury with deliver
- Straddle injury / bicycling
- Pelvic surgery

Chronic inflammatory painful conditions of pelvis
- Interstitial Cystitis
- Irritable Bowel Syndrome
- Endometriosis
- Vulvodynia

Cumulative M. Overload

Hypertonic State

Myofascial TP and Pain

Levator Dysfunction

Life-long voiding dysfunction
“Holding” habits
Postural problems

Centralization

Visceral Pain Syndromes
- IC
- IBS
- Endometriosis
Sites of Procedure Induced Myofascial Pain

any very painful procedure
PFTM  Normal
Symptoms of PFTM

- Achy pelvic discomfort, pressure (differentiate from prolapse)
- Dyspareunia (during or after intercourse)
- Vaginal pain: sharp, burning, throbbing, radiating
- Abdominal, low back, coccyx, suprapubic or hip pain
- Urinary hesitancy or retention, painful urination
- Urinary urgency/frequency, urethral syndrome
- Anismus – functional bowel disease
- Pain with prolonged sitting (in coccyx or ischial tuberosities)
- Pain with tampons or annual exam
 Pearls of PFHTD

- “Pelvic organ prolapse” without prolapse
  - No symptoms of bulge till at hymen +/- 1 cm
  - “Pessary test” will show increase pressure w/ pessary
- Urinary hesitancy, voiding dysfunction, urethral pain
- Anismus, dyschesia, lifelong constipation
- Often worse with prolonged sitting or standing
- Dyspareunia (especially hours after intercourse)
  - Pelvic congestion syndrome also causes this unique symptom.
- Post-op urinary retention (esp. w/ neg LAPS)
- Pressure, cramping, pain w sitting PO and often more bothersome 7-21 days PO
Pelvic Examination

- Evaluation of muscle awareness and function by asking pt to “squeeze and relax”
  - Lifting vs. bulbocavernosus wink
  - No movement or limited relaxation
  - Rebound hypertonus after relaxation
- Negative anal wink

Allodynia!!!!
Examination

- Single digit exam
- Palpation of levator muscles for:
  - Tenderness that reproduces pain
  - Trigger Points
  - Taut bands of fibromuscular tissue
- Obturator muscle tenderness that reproduces “ovarian pain”
- Bladder base tenderness is often found as well and compare this to PF tenderness
Additional Findings

- Elevated mid-urethral closing pressure (>130, +/- age)
- Urethral instability
- IC flairs parallels pelvic floor behavior
- Pudendal blocks temporarily abolish*
  - Elevated mid-urethral CP
  - Urethral instability
  - Urgency / frequency
  - Voiding dysfunction

# Clinical Diagnoses Associated with Discordant Voiding

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So what pts are at risk…?

U/F Syndromes
IC / BPS

Pelvic Floor Hypertonic Dysfunction

Any Visceral Pain Disorders

Vulvar Pain Disorders

Allostynia

Central sensitization is key to cross talk and multi-focal pain generations and persistence
Surgical Approach to the Patient with Pelvic Floor HT Disorders

- When ID’ed, education the pt esp which symptoms are caused by the PF HTD (overlap) and the potential for PO flare.
- Treat the PF HT pre-op which typically involves treating the pain disorders, down regulating the allodynia and teach PF awareness / relaxation.
- Surgical approaches should be chosen to avoid PF muscle trauma and aggressive PO pain control should be planned for.

All pts (rad prostat) with chr. post-operative pain disorders had pre-op pain disorders (at or distant to surgical field)

Gerbershagen HJ Eur J Pain 2009
Mesh Related Pain

• Never use a transvaginal mesh for POP in a pt with ANY PP disorder
• “Prolapse” pain with “prolapse” above the hymen?
• Prolapse repair anchored to 2 or 4 muscle sites is not physiologic
• 5-20% De Novo pain, mostly myofascial
• Of the pts w/ PO “mesh” pain, most had pre-op hypertonic dysfunction!!!
Treatment of HTPFDs
Recommendations

• Treat all sources of pain
  – Abdominal walls T P, IC, endometriosis, IBS

• Correct predisposing factors
  – Stress
  – Sleep disorders
  – Postural problems
  – Dysbehaviors
  – Constipation
Perineal Hyperprotection

Hunter’s sitting pad

$12.99/$19.99
Treatment

• Pelvic floor rehabilitation – up to 80% response
  – “Reverse” Kegels
  – EMG guided biofeedback
  – 30 minutes per day for 8 to 16 weeks
• Physical Tx – 64% cured with 27% improved
  – Myofascial release & other techniques of manual Tx

Retrain PF Awareness

– Iced alcohol & gel condoms especially post therapy
– Find providers: www.womenshealhealthapta.org/
Pelvic Floor Rehab for Urinary, Defecatory and Pelvic Pain
Starr JA 2013 Female Pelvic Med RS

778 pts with PFHT dysfunction (2008 -2012)
Pelvic floor rehab involved at least 5 sessions with:
 pt ed, w fluid and bowel managements strat.
 Vaginal E-stim (30 min each session)
 PF relaxation vs strengthening protocols
 Various drug support as needed
Median improvement of 80-85%

![Graphs showing symptom improvement over sessions](image-url)
Physical Therapy: Soft Tissue Mobilization
Myofascial Release

• Heat via ultrasound
• External stretching and flexibility maneuvers
• Myofascial mobilization techniques
  – Thiele massage – 1937
• Iced alcohol and gel condoms prn
• Vaginal dilators for self-massage
Dilators

Less anxiety, explore what triggers pain and how to avoid reflex spasm
Keep muscles relaxed, how to optimize positions and confidence
Pelvic Floor Myofascial Trigger Points: Manual Therapy for IC & Urgency-Frequency Syndrome

- Retrospective study
- Age range 26-80, n = 52, all having failed other therapies
- Duration of symptoms: 6-14 years
- 70% moderate to marked relief for IC group
- 83% moderate to marked relief for U/F
- Marked reduction in pelvic floor hypertonus
Manual Physical Therapy in Patients with Interstitial Cystitis

Study by Lukban et al, The Pelvic Floor Institute
Graduate Hospital, Philadelphia, Pennsylvania

• N=16, diagnosis of IC & PFD, confirmed SI dysfunction
• Age range = 27-63
• Mean Number of PT visits = 8.72
• Modified Owestry Sex Life Scores:
  – Improvement in 94% (15/16) patients
  – 9 pts returned to pain-free intercourse
  – Conclusion: Manual physical therapy is effective in reducing the severity of irritative voiding & dyspareunia in IC pts born of SI dysfunction.
Myofascial Physical Therapy for Treatment of Urologic Chronic PP

- Randomized multicenter trial, n= 48
- Pelvic Floor Myofascial PT vs global massage Tx
- Positive response rate: 57% vs 21% (p=0.03)

FitzGerald MP J Urol 2009; 182(2):570-580
Pharmacologic Therapies

• Tricyclic antidepressants
  – Amitriptyline / Elavil 25 mg qhs

• Tizanidine / Zanaflex™
  – 2 to 4 mg TID as tolerated
  – 89% response with good to excellent resolution

• Baclofen Supp*  30mg TID for pts w/ chem hypers

• Diazepam / alprazolam esp for anxiety trigger hx anxiety

• Neurolytics especially for “burning” symptoms
  – Gabapentin / Neurontin™ 1800 mg/d
  – Tegretol 200 mg/d
  – Pregablin / Lyrica™ 450mg (300-600mg)

*compounded
Trigger Point Therapy

- Localized neurostimulation (PT modality)
- Injection therapy for active – not latent trigger points
  - 1/2% lidocaine, 5-10 cc with bent Iowa trumpet
  - Post injection massage
  - Repeat every 3 – 7 days, expect increasing response if effective – rarely > 5 TP injections
- Pudendal blocks for multiple pelvic floor trigger points
- Botox® can be very helpful for persistent TP
Bend the Iowa trumpet to do PF injections (w/ pudendal tray)
Pelvic Floor Trigger Point Injections

• Bent Iowa trumpet, 5-10cc volume, in the point of greatest tenderness, localized pain
• > 70% improvement, series of 3-4 injections
• Langford CF, 2007 Neurourol Urogyn
  – 13/18 pts with CPP w/ > 50% reduction VAS
  – 10cc .25% bupivicaine and 10cc 2% lidocaine, w/ 40 mg triamcinolone
  – 6/18 pts completely pain free (F/U 3 months)
Botox TP therapy
Adelowo A, FPMRS 2013

• 31 pts, PF Myofascial Pain, Ave age 55
• 79.3% improved @ 6 weeks
• 51.7% required 2\textsuperscript{nd} injection (16 wk PP)
• 10% retention, 7% FI, 3% constip
Botox, Repeat injections
Nesbitt-Hawes EM

• Retrosp review: n=37, 100 units
• 70% single and 30% multiple
• Equal response w/ follow-up inj
• Follow-up inj; 26-33 wks after prior
My Botox® Procedure...

- Persistent PF myofascial pain
- TP injection (with local anesthesia) success but results are of short duration
- OnabotulinumtoxinA 100 units in 6-10cc dilution
- Inject site(s) of greatest tenderness
- Expect maximum benefit at 4 weeks, repeat if needed to maximum of 300 units in 3 months
Treatment of Mesh Related Pain w/ No Exposure

- Physical Therapy
- Elavil / Lyrica to down regulate
- Trigger point injections (diagnostic of site of pain and therapeutic), if arms / LA interface the site of pain cut the arms (removing 1-2 cm)
- Resection of entire “painful” mesh will benefit approx 50%- last step
Chronic Post-op Pain

Surgery is controlled injury

- It is thought to occur in approximately 10%
- Incidence is based on the degree of intra-op trauma, presence of pre-op pain disorders*, severity of PO pain (duration and intensity), pre-op anxiety scores and PTSD

In one study of CPSP, ALL pts had a pre-operative pain disorder*

*Gerbershagen 2009 Eur J Pain
Hints that Your Pt is at Risk for PO Pain...

• Any pre-op pain disorders: CPP, Fibromyalgia, Pediatric Elimination Disorders, IC / PBS, Vulvodynia

• Tampon pain, Dyspareunia, “shy bladder”

• Pseudo-prolapse (symptoms when POP above the hymen), do *diagnostic* pessary trial

• Allodynia on exam / urodynamics

• Hx anxiety / OCD / PTD

• Post-op pain greater than normal (ID and aggressive treat this!)
Tips to Successfully Operate on CPP Pts

- Education, overlap of symptoms, control anxiety
- Pre-op: drugs (muscle relax and +/- neurolytics), PT and intravesical Tx if needed
- Pre-emptive therapies in pre-op:
  - Epidural anesthesia (even w/ general for LS procedures)
  - 1200 mg PO gabapentin 1 hour pre-op*
  - Tylenol IV pre-op and post-op
- Aggressive immediate PO pain control (esp. if abnormal)
  - Continued epidural
  - Restarting all pre-op drugs
  - Pt to immediately start “reverse Kegels”
- Aggressive management of PO complications

*Multiple studies w/ variable results looking at gabapentin and ketamine
Other Therapies

• Neuromodulation
  – InterStim at S-3 nerve root: 50% response but best for dysfunction- not pain
  – Pudendal nerve stimulation
  – Field Stimulation (2 leads at peripheral site)
  – Bilateral Sacral Nerve Stim. (RAZ)
• Pudendal Nerve Ablation (radio freq tech)
• Intra-theecal pain pumps
“I hope you’re not going to be like the twenty incompetent doctors who couldn’t find anything wrong with me.”
The eyes won’t see what the mind does not look for
In Summary....

• HTPF dysfunction is the most commonly missed component of pain in patients with CPP and dysfunction in pts PFDs that we see daily
• Easy to identify by history, exam and objective testing
• Awareness of this problem and management required for having satisfied pts (especially when our surgeries trigger and / or flare this problem)
• Find and educate a good Physical Therapist
THE INTERNATIONAL PELVIC PAIN SOCIETY

Professionals engaged in pain management for women.

- Join us in educating ourselves to care for women suffering from chronic pelvic pain.

- For more information see your presenter, or call (800) 624-9676.

www.pelvicpain.org