

Biofeedback and Sexual Dysfunction
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Types of painful sexual dysfunction

- Dyspareunia - painful intercourse / penetration. A symptom which can be related to many diagnoses including: endometriosis, Interstitial cystitis, Irritable bowel syndrome, Chronic pelvic pain (CPP), pudendal neuralgia, levator ani syndrome, vaginismus, vulvodynia
- Overactive pelvic floor muscle (PFM) - a muscle that is unable to relax and may contract during voiding, defecation, or penetration. (Messelink 2005)
- Vaginismus - “Recurrent or persistent involuntary spasm of the musculature of the outer third of the vagina that interferes with sexual intercourse.” 4th ed Diagnostic and Statistical Manual of Mental Disorders – American Psychiatric Assoc 2000
 - New definition 5th ed DSMMD 2013 (Binik 2010) – vaginismus and dyspareunia are renamed “genito-pelvic pain / penetration disorder” with 5 dimensions
 - Percentage of successful penetration
 - Pain with vaginal penetration
 - Fear of penetration or pain
 - PFM dysfunction
 - Medical co-morbidity
 - Pathophysiology of vaginismus - PFM spasm with phobic fear of penetration
- Vulvodynia - “Vulvar discomfort, most often described as burning pain, occurring in the absence of relevant visible findings or a specific, clinically-identifiable disorder.” ISSVD
 - Provoked Vestibulodynia (PVD) - “Chronic pain in the vestibule associated with allodynia of the introital margin (outer edge of hymen and inner edge of inner surface of labia minora), often extending to the openings of the Skene ducts on each side of the urethra.”
 - Pathophysiology of Vulvodynia
 - Research suggests abnormalities in 3 interdependent systems (Zolnoun 2006, Andrews 2011)
 - Vestibular mucosa
 - Overactive PFM
 - Central Nervous System (CNS) pain regulatory pathways - sensitization
 - Genetic factors - 32% of patients with vulvar pain had relatives with intolerance to intercourse or tampon use (Goetsch 1991)
 - Hormonal factors (oral contraceptive pills, menopause)
- Study investigates the diagnosis of vaginismus by PT, MD, and psychologist (Reissing 2004)
 - Poor diagnostic agreement in vaginismus and not able to differentiate from PVD

Assessment and manual examination of patients with sexual pain dysfunction

- A comprehensive examination is described in papers and texts (Prendergast 2003, Carriere 2006, Van Alstyne 2010, Chaitow 2012)
- Orthopedic tests of the pelvis
 - Posture assessment
 - Joints - L5/S1, sacroiliac, coccyx, hips, pubic symphysis, alignment, stability, laxity, biomechanics
- Central sensitization - CNS can change, distort or amplify pain changing its duration, intensity and location (Wolff 2011, Nijis 2010)
 - Logistical regression - cluster of 3 symptoms and 1 sign predictive of central sensitization (Smart 2012)
 - Disproportionate, non-mechanical pain, and unpredictable pattern of pain provocation
 - Pain disproportionate to type of injury or pathology
 - Strong association with maladaptive psychosocial factors (negative emotions, poor self efficacy, pain behaviors)
 - Defuse / non-anatomic areas of pain and tenderness on palpation

Pelvic Floor Muscle examination

Patient Position

- Supine – lithotomy position is best
- Do not abduct hips initially – might need to move them during exam but want the pelvis and hips in neutral and not severe abduction

Observe perineal body mobility

- Ask the patient to contract the PFM: PFM strength did not differentiate patients with CPP from controls (Fitzgerald 2011)
- Ask the patient to bear down: involuntary PFM relaxation
 - Present: bulge
 - Absent: contraction or no movement. May indicate muscle tension or spasm but would need to be correlated with other findings
 - Patient effort: some patients do not bear down fully for fear of leaking or releasing gas

Palpate external genital structures

- Focused on pain locations reported by patient and may include
 - Pubic symphysis
 - Lower abdominal muscle, scars on the lower abdominal area
 - Adductor tendons
 - Inferior pubic arch
 - Clitoral area, labia majora, minora – skin mobility, scars
 - Superficial perineal muscles
 - Perineal body, posterior fourchette
- Light and deep pressure: assess all layers
- Compare right versus left
- Response to light touch – hypersensitivity can be related to central sensitization
- Assess for tenderness, tissue thickness, asymmetry, reproduction of symptoms
- Palpation of the pudendal nerve at the pudendal canal externally

Vestibule examination

- Vaginal mucosa
 - Redness possibly due to inflammation (may be 2° neurogenic inflammation)
 - Whiteness due to atrophic vaginitis or lichen sclerosis
 - Look for lesions
 - Vaginal discharge (excessive, green, yellow, blood stained)
- Cotton swab test for provoked vestibulodynia
 - Hold the labia minora open with the left hand
 - Using the cotton end of a cotton swab dipped in lubricant or water
 - Pressing light enough to deflect 1 mm, touch the inside of the vestibule at 12:00 and quadrants 12-3:00, 3:00-6:00, 6:00-9:00, 9:00-12:00 in RANDOM order to avoid inflated response
 - Severe pain on light touch is positive (especially 3:00 to 9:00)
 - The fourchette (6:00) is tested last as this is an area of high probability of provocation and may influence the response of other areas tested (Strauhal 2007)

Vaginal PFM Examination for pain

- Palpate the muscles: inside the vagina with a broad contact on the side of the finger initially, use finger tip if more aggressive palpation is needed
- Ask for active contraction and bearing down - judging for mobility of the muscle - no strength grade is given
- Slide vaginal skin – test for scar mobility and adhesions
- Palpate all areas of the muscle 1:00 to 11:00 and all depths superficial to deep (Jarrell 2005)
 - Pubococcygeus
 - Peri-urethral tissue
 - Obturator internus
 - Iliococcygeus
- Judge for tenderness / pain, tissue tension/thickness, fascial mobility
- Firmness of vaginal tissue may be – contractile or non-contractile
- Palpation of the pudendal nerve at the pudendal canal internally

Evaluation of trigger points (TrPs): (Simons 1999, Dommerholt 2006, Lucas 2009)

- Palpation for PFM pain (although somewhat variable) has good reliability (Slieker-ten Hove 2009, Kavvadias 2013)
- PFM tenderness found in up to 33% of asymptomatic females (Kavvadias 2013)
- Inability to maintain PFM relaxation - 20% of healthy women (Tu 2008)
- Current description of TrP - Hyperirritable nodule located within a taught band that is tender and produces pain referral.
- Identification of TrP is unreliable (Lucas 2009)
 - Best reliability for subjective signs - pain, tenderness and jump sign
 - Worse reliability for location of taught band and local twitch response
- Compression of the TrP: significant local pain, jump sign, pain is familiar to the patient

Examination of overactive PFM with Electromyography (EMG)

Factors influencing resting baseline

- Skill of the operator - poor EMG signal = artifact
- Medications and other chemicals the patient is taking – medications which artificially decrease EMG signal: Sedatives, Antihypertensive, Anticholinergic, Anti-angina drugs, Anti-spasmodic, Proton pump inhibitors
- General holding – nervous - not muscle spasm
- Patient position - normal resting baseline maybe higher in standing (Morgan 2005)
- Comparing session - it may not be reliable to compare day to day or patient to patient - look for trends and correlation with symptoms

Evaluation measurements

- Many different protocols, no studies
- Very few hard and fast rules – the art of interpretation
- EMG assessment must be taken in context with other examination findings. Patient has symptoms of overactive PFM – obstructed urination, obstructed defecation, pain
- 1 to 2 minute resting baseline
- Recheck resting baseline between tests

Normal resting tone

- Baseline fairly constant
- Without large spikes
- Between contractions
- There is no microvolt (uV) level below which normal resting tone occurs (Potach 2006)
- Past standard has been below 2 uV, this may be too strict and does not take other variables into account

Standard deviation

- Variation size or "jumpiness" of a signal
- No norms established
- Vulvodynia patients – less than 0.5 to 1.0 = decreased pain (Glazer 1995)

Overactive PFM

- Baseline between contractions – inconsistent and elevating
 - Variations of more than 2 uV may be considered inconsistent (opinion only)
 - Rest 1 - 5.45uV
 - Rest 2 - 3.02 uV
 - Rest 3 - 4.89 uV
 - Rest 4 - 6.34 uV
- Resting baseline - varies widely from session to session, especially in relation to pain
- Elevated standard deviation
- Slow return to baseline after contraction, startle or frightening – overactive PFM is slow

Research related to EMG and overactive PFM

- Women with PVD (compared to controls) had (Gentilcore-Saulnier 2010)
 - Higher PFM tone in superficial muscle
 - Decreased PFM flexibility
 - Lower PFM relaxation capacity
 - These changes were not present after PT treatment
- Correlations of EMG examination of women with vulvodynia (Jantos 2008)
 - PFM dysfunction correlation with patients with vulvodynia
 - EMG level not correlated with pain level
 - Negative correlation of EMG level and duration of pain – longer pain duration correlated to lower EMG readings – development of functional muscle contracture
- 2/3 of dysfunctional muscles will have normal resting baseline (Cram 1998)

PFM TrP

- Clinical experience has shown presence of PFM TrP with normal resting baseline on EMG
- Patients with pelvic pain may have normal resting baseline (Potach 2006)
- Suggested treatment: treat TrP manually, do not use specific PFM EMG

Palpation versus EMG - contractile and non contractile tissues

EMG	Palpation	Possible cause
High uV level	Soft muscle	Artifact
High uV level	Hard muscle that relaxes easily with pressure and verbal cues	Overactive PFM - holding pattern
High uV level	Hard muscle that does not relax easily with pressure and verbal cues	Overactive PFM – spasm
Normal uV level	Soft muscle	Normal PFM
Normal uV level	Hard muscle	Short PFM Trigger points in muscle Connective tissue restriction

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