

Pelvic Floor Dyssynergia: It's Relevance to the Anorectal Bowel Dysfunctions and Management Guidelines

Inder Perkash*

Department of Urology and Division of Gastroenterology and Hepatology, Stanford University, California, USA

Introduction

Neural control of the pelvic organs is one of the most intriguing in the body involving both autonomic and somatic components organized in the thoraco-lumbar (sympathetic), lumbosacral (somatic), and sacral (parasympathetic) spinal cord. Loss of supraspinal descending control and plasticity-mediated alterations at the level of the spinal cord, result in loss of voluntary control and in abnormal functioning of these systems including the development of dyssynergia and spasticity. Originally DSD has been used for Bladder external urethral sphincter discoordination, also known as detrusor external sphincter dyssynergia. The ICS standard terminology agreed in 1998, "DSD is a consequence of a neurological pathology such as spinal cord injury or multiple sclerosis that disrupts central nervous system regulation of the Micturition (urination) reflex, resulting in discoordination of the detrusor muscles of the bladder and the external urethral sphincter muscles [1]". Since anal external sphincter and external urethra sphincter share essentially the same innervations [2], these patients also have Ano-rectal and Pelvic floor dyssynergia (PVD) following spinal cord lesions. The terms Detrusor Sphincter Dyssynergia (DSD) and dyssynergic response indicated uncoordinated external urethral sphincter (EUS) on attempted voiding in complete and incomplete spinal cord injury lesions [1]. In normal persons attempted voiding leads to the relaxation of the external urethral sphincter; however in any supraconal spinal cord lesion below Pontine Micturition Center, there is a failure of relaxation of the urethral sphincter which leads to retention of urine. In incomplete lesions there may be some intermittent relaxation on attempted voiding which was referred as dyssynergic response [3]. This can be demonstrated on simultaneous recording of bladder pressures [Manometry] and a periurethral EMG studies.

Spinal cord injury (SCI) will result in bladder or bowel dysfunction that is termed as "neurogenic bladder" or "neurogenic bowel". Supraconal lesions below Pons will thus lead to an uncoordinated external anal sphincter. This can contribute to difficult bowel evacuation and has been called as Pelvic Floor Dyssynergia (PFD). It has been sometimes also referred to as Anismus. It is marked by the failure of pelvic floor muscles to relax, and or lead to a paradoxical contraction of the pelvic floor muscles on attempted bowel evacuation. The impact of SCI on bowel is less severe since bulk of the bowel up to transverse colon is innervated by vagus nerve. The severity of colo-rectal dysfunction depends upon the degree of completeness and level of injury. These problems have an extensive impact on quality of life. A Cochrane review concluded that the treatment of bowel dysfunction (GI) in patients with central neurological diseases remains empirical [4].

Spinal Guarding Reflex and the Pelvic Floor Musculature

It is composed of a group of muscles that span the underlying surface of the bony pelvis, which function to allow voluntary urination and defecation. The striated muscle of the pelvic floor is tonically contracted in the resting state, and there is reflex contraction when intra-abdominal pressure rises, as during a cough, straining, jumping and exercise. This spinal reflex is a protective (guarding reflex) to prevent leakage of urine or even fecal matter. Unconscious relaxation of the striated pelvic floor muscles accompanies straining during defecation in normal subjects. However, in certain people the striated muscles of the pelvic floor contract, rather than relax, on straining thus causing Pelvic

Floor Dyssynergia (PFD). This paradoxical contraction in functional bowel dysfunctions and also following neurologic impairment refers to an abnormal increase of pelvic floor muscle activity with defecation or urination, rather than the normal decrease in muscle activity that is necessary in order to have a normal bowel movement and urination. This condition thus can contribute to some forms of constipation, complaints of incomplete evacuation, and straining with stool.

Functional Defecation Disorders

They are common and have been reported in approximately 50% of patients with chronic constipation [5]. Symptoms alone are inadequate to distinguish patients with defecation disorders from other disorders. Detailed clinical examination and anorectal physiologic tests are required for definitive diagnosis; Anorectal Manometry is now widely used to define bowel evacuation problems related to chronic constipation.

Obstructed Defecation

Among the subtypes of constipation, obstructed defecation is fairly common, occurring in about 10% of persons with chronic constipation [6]. In most people with obstructed defecation, there is an inappropriate or failed relaxation of the pubo-rectalis muscle and of the external anal sphincter during attempted defecation. This paradoxical contraction of the pelvic floor muscles during straining at defecation is considered a form of maladaptive learning and has been called as pelvic floor dysfunction or Pelvic Floor Dyssynergia (PFD) even in the absence of neurologic impairment. Clinical presentation of PFD is straining at stools and feelings of incomplete evacuation. The need for perineal or vaginal pressure to allow evacuation of stools is a strong clue for its diagnosis. The diagnostic criteria were elucidated in the Rome II report and include those for functional constipation plus at least two out of three investigations among Manometry, Electromyography and Defecography, showing inappropriate contraction or failure to relax the pelvic floor muscles [6].

The Rome III criteria, developed in 2006 [7,8], define functional constipation as involving at least two of the following symptoms occurring with 25% of defecations: straining, lumpy or hard stools, feeling of incomplete defecation, feeling of blockage, or use of manual maneuvers. Having fewer than three defecations per week is also a symptom. The criteria also stipulate that for functional constipation to be present, loose stools must be rare without laxative use, and

*Corresponding author: Inder Perkash, Department of Urology and Division of Gastroenterology and Hepatology, Stanford University, California-94305, USA, Tel: 650-787-9923; E-mail: perkash@stanford.edu

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irritable bowel syndrome must be ruled out. Patients who met these criteria underwent both a DRE and anorectal Manometry, with the latter considered the gold standard for the diagnosis of dyssynergia. Unfortunately there is little or no reference to any associated neurologic lesion or suggested anorectal neurologic or urodynamic assessment. Currently patients presenting to GI for bowel problems and to urology for bladder dysfunctions get fragmented care and invariably have a missed diagnosis.

Limitation of Anorectal Manometry for the Diagnosis of PFD

This alone has limited value. It will demonstrate normal relaxation of the internal anal sphincter in response to rectal balloon distension; however, during straining, there will be inappropriate contraction of the external anal sphincter that will manifest more clearly as increased activity on EMG and increased external anal sphincter pressures. Anorectal Manometry alone is therefore clinically useful in relatively few patients with chronic constipation [6]. Relaxation of the internal anal sphincter is a reflex initiated by rectal distention or by passage of a peristaltic wave down the left colon. Aganglionosis of the colon, as in Hirschsprung's disease, leads to failure of relaxation of the internal sphincter on rectal distention. This is shown on manometric studies; the technique has potential value in exclusion of Hirschsprung's disease and in assessment and treatment of constipated adults who exhibit pelvic floor dyssynergia, especially if this is corroborated by anal sphincter EMG and by impaired expulsion of contrast with Defecography [6].

Critique on PFD in Bowel Dysfunctions

The term PFD like DSD could indicate an associated neurologic impairment. It seems appropriate to refer Pelvic floor dyssynergia as a dyssynergic response (PFDR) unless it is associated with a definable neurologic impairment. The term PFDR seems more appropriate with absent neurologic lesion. This also mandates a neurologic assessment and digital rectal examination along with Anorectal Manometry in all such patients. Unfortunately it seems that this has not been an emphasized practice in published studies. Anorectal Manometry "may be falsely positive for dyssynergia in 15% of asymptomatic subjects," according to one study cited by the authors [9].

Digital Rectal Examination [DRE]

The digital examination is critical. It should help evaluate resting tone of the anal sphincter, which should be normal, and a squeezing effort to evaluate voluntary control. This shows intact central control. The voluntary external sphincter will be tightened by squeezing effort with normal sphincter tone. Digital rectal examination had a highly positive predictive value for diagnosing dyssynergia in patients with chronic functional constipation [9]. The pubo-rectalis muscle should be palpated and compressed between the rectal forefinger and external thumb; acute localized pain along the border of the muscle is a feature of the pubo-rectalis spasm syndrome which may accompany PFD. Finally, the patient should be instructed to integrate the expulsory forces by requesting that she/he expel the finger. In the presence of normal sphincter tone, failure to expel the finger is a strong clue to PFD or PFDR. In patients with absent anal sphincter voluntary contraction, bulbo cavernous reflex evaluates the integrity of the spinal center. In Cauda equina lesions BCR is absent, and anal sphincter is flaccid with possibility of bowel incontinence.

Pathophysiology of Constipation in Neurologic Impaired Patients

In neurologic impaired patients pathophysiologic mechanisms

leading to constipation are obstructed defecation, weak abdominal muscles, impaired rectal sensation, and delayed colonic transit time [9-11]; the causes for fecal incontinence include impaired external sphincter contraction (conus and Cauda equina lesions), uninhibited rectal contractions and impaired rectal sensations. It is imperative to have a careful DRE to define these problems. An examination should also be made to look for a rectocele, or consideration be also given to Defecography to help complement ARM studies in ruling out slow transit and other causes of constipation. Defecography detects structural abnormalities and assesses functional information on the movement of the pelvic floor and the organs that it supports, conversely, excessive descent (descending perineum syndrome) can also be a pathophysiologic mechanism of constipation. Magnetic resonance imaging and/or pelvic floor sonography can further complement.

Management Strategies for PFDR

Since pelvic floor muscles are controlled voluntarily, their function can be improved through various learning procedures, such as biofeedback. Which is a neuromuscular reeducation tool? However, Biofeedback is not effective in patients with neurologic impairment unless it is an incomplete lesion. It is therefore important to rule out any neurologic impairment with a careful neurologic examination along with ARM studies for its effective role. In majority of the patients, an approach to the bowel program for adequate evacuation is individualized with a set time, diet control, and digital stimulation with and without a glycerin suppository. Often more than one procedure is necessary for individuals that have difficulty in developing an effective bowel routine.

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