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Short Communication Open Access

MR Defecography, a Diagnostic Test to Evaluate the Pelvic Floor Motion in Patients with Dyssynergic Defecation after Biofeedback Therapy

Afsaneh Nikjooy*

Department of Physical Therapy, Iran University of Medical Sciences, Tehran, Iran

Short Communication

Dyssynergic defecation (DD) or paradoxical puborectalis contraction syndrome, one of the most common functional defecation disorders which has been observed in up to 50% of patients with chronic constipation, is recognized as a major cause of chronic functional constipation [1].

In this study, our main aim was to determine the differences between the subjects with dyssynergic defecation and the dynamic indices of the pelvic floor i.e., anorectal angle and perineal descent, before and after biofeedback therapy with MRI defecography (dynamic pelvic MRI). We studied Patients that had been trained, the paradigm of the task was squeezing, relaxation, and straining which was continued until defecation occurred in the rectum.

There is major controversy on the factual relevance and accurate role of the anorectal angle (ARA), as a dynamic index of pelvic floor motion in the assessment of pelvic floor dysfunction, and some authorities do not use ARA for this assessment, though it is recommended by many authors in dyssynergic defecation. The diagnostic findings on functional MR imaging can include a prominent impression of the puborectalis sling, narrow anal canal, upward bulge of the levator plate, failure to increase ARA, and a lack of descent of the pelvic floor [2]. In other words, dynamic MR sagittal images reveal the anorectal angle during strain to defecation to become more acute instead of obtuse, reflecting the fact that the puborectalis muscle fails to relax during the defecation process [3]. Therefore, ARA seems to be a reliable measurable index to show the paradoxical function of the patients' pelvic floor muscles.

The effect of gravity on anorectal function/dysfunction is another controversial topic in pelvic floor evaluation. Ribas et al. in their clinical article "Imaging of pelvic floor disorders: are we underestimating gravity?" have commented that pelvic floor imaging in supine position, even when defecating, underestimates the extent of pelvic floor abnormalities because the levatorani is not completely relaxed [4]. This controversy has also been analyzed in a recent meta-analysis by Maglinte and colleagues [5].

Maglinte and colleagues suggested that evacuation in a position similar to that which precipitates the symptoms, while sitting on a commode, was logical. This was not achieved with supine MRI while patients extend their legs in protocols with rest and strain sequences only. It notable to mention that patients in our study used to lie in the supine position, while there was a pillow placed under their knees to simulating a defecation position [6] and their lumbopelvic region was completely covered for further privacy and convenience; they had pads to defecate the contrast material. We tried to prepare a relatively relaxed position with placing the patients` hips in flexion as much as possible, to make the rectoanal canal straighter to facilitate straining with further ease and force [7]. Moreover, if the imaging procedures were done in a real sitting position, with an artificial surrounding which would embarrass and inhibit the patient, the images would not represent the physiologic defecation. It seems that this situation can inhibit the influence of gravity. Furthermore, as was discussed by Maglinte and colleagues, functional imaging, done either with DCP or with dynamic pelvic MRI conducted in artificial surroundings that would embarrass and inhibit the patient, did not represent physiological defecation. However, Maglite's analysis of the different controversies surrounding the DCP and dynamic pelvic MRI reflects the issue to be the authors` preference [5].

The actual evacuation must be part of the examination to show the full extent of the pelvic organ prolapsed [4], though we really didn't need it. Complete replication of evacuation phase is not a requirement for assessing dyssynergia whereas the intention to defecate and the reaction of the muscles are important to diagnosis. We did not need to measure the maximum pelvic floor descent. Normally, during defecation, M-Line decreases between rest and defecation and a normal perineal descent is diagnosed [8]. However, if the paradoxical contraction of anal sphincter and puborectalis muscle lead to a lack of lowering the pelvic floor during straining and defecation, compared with the rest position, an abnormal perineal descent is diagnosed [9]. The key in the assessment of pelvic floor disorders is achieving a correct diagnosis to deliver the appropriate treatment plan [4]. We were able to identify the real pattern of defecation with the procedure we implemented. In a patient with a dyssynergic pattern, the striated pelvic floor musculature puborectalis or anal sphincters contract involuntarily, inappropriately and paradoxically as soon as he or she intends to defecate [2]. In fact, the clinical symptoms are difficulty in initiating the evacuation [3].

The relaxation of puborectalis muscle and widening of the ARA during defecation are learned responses which occur unconsciously, and they cannot be influenced by gravity substantially in the beginning.

Our main goal was to determine a dysfunctional pattern of defecation that should and could be corrected just by behavioral and biofeedback therapy. This will obviously need an imaging modality which is less invasive and less harmful (i.e., lower radiation exposure) which is more widely available, rather than something like open-configuration magnets which are scarce and not widely available and at the same time, more expensive [4].

Many articles have suggested MR defecography, performed either in supine or sitting position, to be an accurate imaging modality to assess clinically relevant pelvic floor abnormalities of posterior compartment without radiation exposure [2,3,6,9-12].

Validation of supine "functional" imaging technique, as suggested based on a frequently cited MR article by Bertschinger and colleagues [12] is said to be flawed since the gold standard used was physical examination with its already known limitations. But, there is an

***Corresponding author:** Afsaneh Nikjooy, Assistant Professor of Physical Therapy, Department of Physical Therapy, Iran University of Medical Sciences, Tehran, Iran, Tel: 982122121075; E-mail: afsanehnikjooy@yahoo.com

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important point should to remember. In order to appreciate the utility of rectal examination in guiding the diagnosis and also to recognize the prevalence of pelvic floor dysfunction as an etiologic factor for chronic constipation, Tantiphlachiva and colleagues performed a study on digital rectal examination (DRE) and defined the sensitivity and specificity of DRE for detecting dyssynergia in patients with chronic constipation at 75% and 87%, respectively and the positive predictive value of 97% for the procedure [13]. Therefore, as they also suggest, DRE appears to be a reliable tool for identifying dyssynergia in patients with chronic constipation. Digital rectal examinations can guide and facilitate the selection of appropriate candidates for further physiologic testing and treatment among these patients. Moreover, DRE also was able to differentiate normal, increased, or decreased anal resting pressures as well as anal squeeze pressure in both male and female patients. Furthermore, almost all patients with excessive perineal descent as well as those with a history of digital maneuvers were found to have features of dyssynergia on DRE which were confirmed by anoractal Manometry [13].

Contrary to the general belief that fluoroscopic examination should yield better results since it is performed in an upright position, it has been shown that no significant difference exists between the results of MR and fluoroscopic examinations despite MR imaging being performed in a supine position [2]. Furthermore, as discussed by Gufler H and colleagues, measurement data from dynamic MRI are not statistically different at pelvic straining from data from colpocystoproctography either in supine or upright positions [14].

It is better to determine the choice of imaging by local expertise and logistics. Regardless of imaging bias, radiologists` experience will be the most relevant factor. Practitioners should try both methods, namely DCP and dynamic pelvic MRI and using their best professional judgment; decide which of the two methods would be the most functional and logistically practical one to perform in their own practices [5].

Finally, MR defecography is recommended to be an excellent modality which can simultaneously evaluate global pelvic floor anatomy and dynamic motion [15].

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