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Editorial

Three-dimensional High-resolution Anorectal Manometry Is Never Like the Last Conventional Anorectal Manometry?

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Article: Three-dimensional high-resolution anorectal manometry in children with non-retentive fecal incontinence
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Fecal incontinence (FI) is the involuntary passage of fecal material in the underwear and occurs in a child with developmental age of more than 4 years old.[1] The 4 main FI groups among pediatric patients include functional constipation (retentive FI), non-retentive fecal incontinence (NRFI), anorectal malformations, and spinal abnormalities.[1] The Rome IV diagnostic criteria for NRFI must include all of the following in a child with a developmental age older than 4 years and at least a 1-month history: (1) defecation into places inappropriate to the sociocultural context, (2) no evidence of FI, and (3) after appropriate medical evaluation, the FI cannot be explained by another medical condition.[2] The pathophysiology of NRFI remains unclear.[3] NRFI is associated with emotional disturbance, unconscious anger, and sexual abuse.[4] Literature reported that conventional anorectal manometry (AM) is not useful to distinguish between children with retentive FI and NRFI.[5,6] Children with NRFI generally have comparable findings of conventional AM compared to asymptomatic controls, but some of them may have abnormal anal resting pressures and abnormal defecation dynamics.[5-7] This suggests that conventional AM does not provide any benefit to guide the evaluation and management of patients with NRFI. There is no indication to routinely perform AM in children with NRFI.[8] A previous randomized study reported biofeedback therapy for children had an additional effect on the success rate and increased the rate of normal defecation dynamics at the end of the intervention period.[9] Although factors predicting the response to biofeedback therapy were not shown in the study, it is plausible to think that abnormal AM metrics may be related to the success rate. The clinical relevance of biofeedback in the treatment of NRFI is however questioned as there are few relevant studies.[8] In addition, children with NRFI had normal AM metrics.

In this issue of *Journal of Neurogastroenterology and Motility*, Banasiuk et al[10] firstly reported that 3-dimensional high-resolution anorectal manometry (3DHRAM) provides novel insights regarding the pathophysiology of NRFI, although this should be confirmed by larger studies. First, the resting and squeezing anal pressures in patients with NRFI are lower than that in the asymptomatic controls. Given the studies for adults with FI, this finding seems to be plausible. Second, all thresholds of sensation are higher in patients with NRFI. Possibly, increased thresholds are the consequence of adaptive process to avoid fecal leakage in patients with

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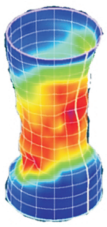
Resting frame



Proximal half of the anal canal				
	Anterior	Left	Posterior	Right
	0%	8%	20%	12%
Distal half of the anal canal				
	Anterior	Left	Posterior	Right
	20%	8%	0%	4%

Squeezing frame

Proximal half of the anal canal				
	Anterior	Left	Posterior	Right
	3%	3%	12.1%	0%
Distal half of the anal canal				
	Anterior	Left	Posterior	Right
	15.2%	3%	6.1%	3%

Figure. Proportion of incontinent children who had resting and squeezing pressure within the normal range and decreased pressure of the anal segment.

defective anal sphincters. Last, multiple discrete pressure defects of the anal canal are found in patients with a normal resting pressure (Figure). These focal anal defects diagnosed by 3DHRAM may serve as a potential mechanism of incontinence that would not have been not revealed by conventional AM. Detailed information following 3DHRAM for these children may provide information regarding predicting favorable response to biofeedback therapy.

Recently, the introduction of 3DHRAM has allowed for the assessment of anorectal function in minute detail.[11] The method provides detailed analysis of the functional anatomy of the anal sphincter and discrete pressure defects that may influence continence function. However, the benefit of 3DHRAM over conventional AM in clinical practice is questioned in contrast to the field of the esophagus. No data shows additional benefits over the conventional AM in the FI management, and the role of 3DHRAM in discriminating healthy individuals from patients with dyssynergic defecation is unclear.[12,13] This may be partly due to the use of the same conventional AM parameters in 3DHRAM examination. These conventional metrics may not adequately reveal the 3-dimensional data shown during 3DHRAM. A recent study showed that the high-resolution AM squeeze integral (55% sensitivity) is more accurate than conventional AM squeeze increment (32% sensitivity) in identifying anal hypocontractility in incontinent women.[14] About half of women with incontinence who were classified as having normal anal function based on conventional AM measures, were reclassified as having abnormal function based on high-resolution AM measures.[14] We need to develop promising 3DHRAM-specific metrics allowing for better research and understanding of the anorectal function.

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