

RESEARCH LETTER

Rectal Evacuation Disorders in Patients Presenting With Chronic Functional Diarrhea



Defecatory disorders include a spectrum of conditions that manifest as spastic rectal evacuation disorders or flaccid disorders causing obstructed defecation.¹ Functional defecation disorders are usually evidenced by 2 of the following 3 tests documenting impaired evacuation: abnormal balloon expulsion test, abnormal anorectal evacuation pattern with manometry, or impaired rectal evacuation by imaging. Descending perineal syndrome is defined by at least 4-cm caudal movement of the anorectum upon defecation with a failure of rectoanal angle opening, outlet obstruction, and incomplete defecation.² Diagnosis currently relies on identifying excessive perineal descent on digital rectal examination

(DRE) with confirmation on defecating proctogram.² Clinical experience had identified the coexistence of defecatory disorder in patients presenting with chronic diarrhea. Diarrhea-predominant functional disorders may present with fecal urgency and incontinence, usually because of concomitant weakness of the internal or external anal sphincters or fatigue of the voluntarily controlled external anal sphincter.³

The aim of this study was to explore clinical evidence of spastic or flaccid defecatory dysfunction based on anorectal manometry, balloon expulsion, and magnetic resonance defecography in patients with chronic functional diarrhea based on the clinician's assessment of stool frequency and consistency. Further details regarding methods and criteria for evacuatory dysfunction are provided in the Supplement. The distribution of investigations performed in these patients is detailed in Figure.

Our study showed that out of the 1071 patients with chronic functional

diarrhea (Figure), 30 patients were identified as having clinical evidence of evacuation dysfunction. Table describes patient demographics, diarrhea characteristics, anorectal manometry mechanics, and DRE findings. Chronic diarrhea patients with clinical suspicion of rectal evacuation disorder were more likely to be female and to have diarrhea alternating with constipation, straining, a sense of incomplete evacuation, and fecal incontinence (all $P < .05$). One patient had perineal descent of 0.3 cm, external sphincter atrophy with normal puborectalis muscle on defecation proctography, and a low squeeze sphincteric pressure of 56.9 mmHg. This patient had a history of rectal cancer and pelvic radiotherapy and was excluded from our study. Seven patients were deemed to have criteria consistent with spastic evacuation disorder and had at least 2 out of the 3 manometric abnormalities.

Three patients had defecation proctography evidence of a flaccid dysfunction, and 2 patients had findings on defecation proctogram

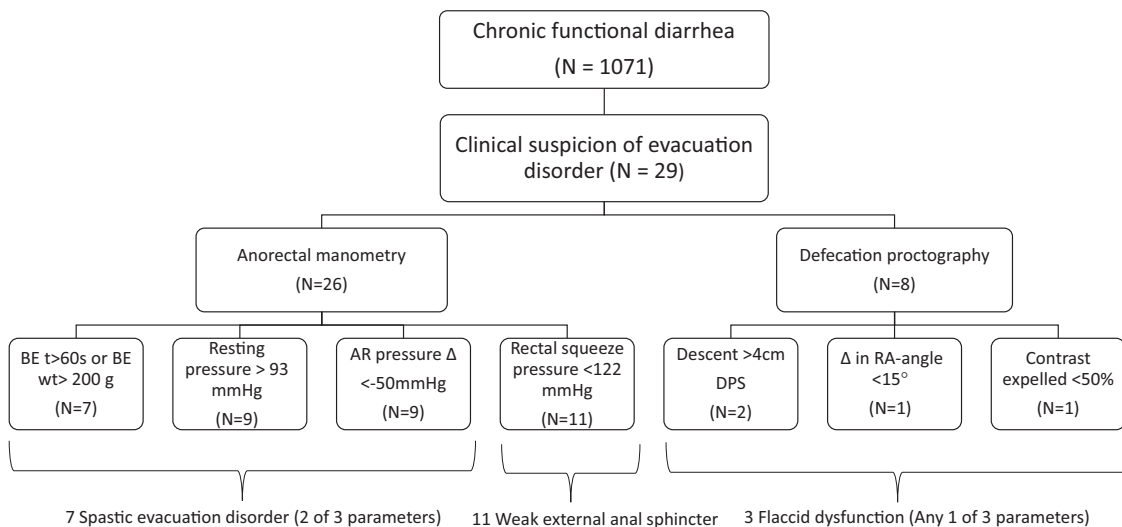


Figure. Patients' diagnoses and summary of results obtained on anorectal manometry and defecation proctography. Among the 26 patients who underwent anorectal manometry, 23 had a high-resolution anorectal manometry and 3 had a non-high-resolution anorectal manometry. Five patients underwent the weight-based balloon expulsion test, whereas 18 patients underwent the time-based balloon expulsion test. Eight patients underwent defecatory proctogram: 4 magnetic resonance proctography and 4 barium proctography. Seven of the patients presenting with chronic diarrhea and clinical suspicion of anorectal dysfunction had evidence of spastic evacuation disorders. Among the 11 patients with weak external anal sphincter, 2 also presented evidence of flaccid dysfunction of the pelvic floor. Δ , change; BE, balloon expulsion; DPS, descending perineum syndrome; RA, rectoanal; t, time; wt, weight.

Table. Demographics, Diarrhea Characteristics, Relevant Concomitant Medications, Anorectal Manometry Mechanics, and Digital Rectal Examination Findings in Patients With Diarrhea and Clinical Suspicion of Rectal Evacuation Disorder

	Rectal evacuation disorders (N = 29)				Chronic diarrhea (N = 1071)	χ^2 statistic	P-value ^c
	Spastic evacuation disorder (N = 7)	Weak external anal sphincter (N = 11)	Flaccid pelvic floor (N = 3)	Total (N = 29)			
Demographics							
Mean age (y)	46.6	59.5	47.7	55	51.1		
Sex (% females)	85.70%	100%	100%	86.2%	67.8%	4.4	.035
≥1 vaginal delivery (number)	4	11	3	22	NA		
≥3 vaginal deliveries (number)	2	8	1	13	NA		
Median number vaginal deliveries (IQR)	1.5 (0.2, 2.7)	3 (2.5, 3)	2 (2, 2.2)	3 (2, 3)	NA		
Diarrhea characteristics							
Mean fecal weight (g/48 h)	285.1	555.5	831	399.5	557.9		
Average bowel movements/d	4	3.31	4.7	5.1	6.3		
Average Bristol SFS (1–7 scale)	6.4	6.07	6.2	5.9	5.9		
N with alternating with constipation (%)	3 (42.9)	5 (45.5)	1 (3.2)	10 (34.5)	139 (13.0)	11.2	<.001
N with urgency (%)	3 (42.9)	5 (45.5)	0	13 (44.8)	387 (36.1)	0.9	.34
N with straining (%)	2 (28.6)	2 (18.2)	2 (66.7)	7 (24.1)	65 (6.1)	15.1	<.001
N with incomplete evacuation (%)	0	6 (54.5)	3 (100)	10 (34.5)	98 (9.1)	20.5	<.001
N with fecal incontinence (%)	2 (28.6)	6 (54.5)	1 (33.3)	17 (58.6)	259 (24.2)	17.8	<.001
N who received BF (%)	5 (71.4)	5 (45.5)	2 (66.7)	12 (41.4)	NA		
N with improvement after BF/# with follow-up after BF	1/2	2/2	0/1	3/6	NA		
N with bile acid diarrhea (%)	3 (42.8)	4 (36.4)	0	12 (41.4)	496 (46.3)		
Numbers of patients receiving specific medications							
Loperamide (N)	4	2	0	8	291		
Diphenoxylate/atropine (N)	0	0	0	1	100		
Hyoscyamine/dicyclomine (N)	0	0	0	0	96		
Narcotics (N)	0	2	2	7	152		
Benzodiazepine (N)	0	0	0	2	103		
Digital rectal examination							
Digital rectal examination preformed, N (%)	5 (71)	10 (90.1)	3 (100)	25 (86.2)	NA		
Abnormal examination, N (%)	4 (80)	7 (70)	2 (66)	20 (80)			
Abnormal tone	3	3	2	10			
Abnormal squeeze	1	4	2	6			
Abnormal descent	3	3	0	11			
Abnormal simulated defecation	2	5	0	13			
Other abnormalities found on examination	2	3	0	8			

Table. Continued

	Rectal evacuation disorders (N = 29)				Chronic diarrhea (N = 1071)	χ^2 statistic	P-value ^c
	Spastic evacuation disorder (N = 7)	Weak external anal sphincter (N = 11)	Flaccid pelvic floor (N = 3)	Total (N = 29)			
Anorectal manometry ^d (n = 26)							
Balloon expulsion weight (g)	376, 564 ^b	0	0	564 (400, 546); N = 5	NA		
Balloon expulsion time (s)	28 (27, 61); N = 5	14 (8, 18); N = 9	8, 9 ^b	14 (8, 24); N = 18			
Resting pressure (mmHg)	96.8 (94.8, 117.9)	68.8 (56.9, 74.2)	62 (53.4, 70.8)	75.5 (57.4, 96.5)			
Rectal squeeze pressure (mmHg)	213.6 (137.05, 260.35)	87 (74.8, 112.1)	115 (101, 164)	137.1 (89.8, 210.4)			
Anorectal pressure differential (mmHg)	-56.8 (-86, -47.9)	-34.2 (-41.3, -19.9)	-39.9 (-59.9, -20.0)	-40.5 (-74.75, -21.4)			

Patients were considered to have bile acid diarrhea if primary bile acid >10%, total fecal bile acid >2337 μ moles or total fecal bile acids >1000 μ mole, and primary bile acids >4% in a 48-hour stool collection.
 BF, biofeedback; BSFS, Bristol Stool Form Scale; IQR, interquartile range; N, number; NA, not available.
^aAll anorectal manometry data provided are median (interquartile range) unless stated otherwise.
^bAbsolute values provided for 2 patients.
^cP values for the chi-square test comparing the characteristics suggestive of rectal evacuation disorder between the chronic diarrhea cohort and patients with suspicion of rectal evacuation disorders (n = 29).

suggestive of descending perineum syndrome (Figure).

Eleven patients had a squeeze anal sphincter pressure less than 122 mmHg. One of the 11 patients had evidence on anal ultrasound of injury to the external anal sphincter. On defecation proctogram, 2 patients had an enterocele, one patient had mucosal prolapse, and 2 patients had a cystocele. Three patients had rectoceles: 2 patients had anterior and posterior rectoceles, and one patient had one anterior rectocele. One patient with descending perineal syndrome had also been diagnosed with Ehlers-Danlos syndrome, hypermobility subtype.

Our study highlights objective findings in patients with chronic functional diarrhea at a tertiary referral center in whom there was clinical suspicion of evacuation dysfunction.

Rectal evacuation disorder constitutes the second most common type of chronic constipation and is an acquired behavioral disorder of defecation.⁴ We found that 26.9% of our patients with chronic diarrhea who underwent clinically indicated anorectal manometry had a spastic evacuation disorder and 37.5% of patients who underwent defecation proctogram had evidence of flaccid dysfunction.

Among these patients with chronic diarrhea with spastic evacuation disorders on formal testing, one hypothesis is that patients develop learned behaviors or functions that get conditioned to prevent involuntary fecal incontinence. In an attempt to prevent incontinence, patients develop learned behaviors that result in a spastic pelvic floor, which may be amenable to biofeedback to enhance coordinated defecation.⁵ Conversely, fecal incontinence might also be seen in patients with constipation due to overflow, pelvic floor dysfunction, or denervation.⁶

Moreover, 42.3% of the patients with chronic diarrhea and clinical suspicion of evacuatory dysfunction had evidence of a weak external anal sphincter which had continuous contractile activity at rest, and its tone increased by reflex enhancement

during increased intra-abdominal pressure. Incontinence is associated with lower anal sphincter pressures at rest and during squeeze.⁷

Evidence of flaccid dysfunction was found in 3 of the 8 patients who underwent defecation proctography, 2 of which had descending perineum syndrome. Descending perineum syndrome is frequently implicated in constipation, especially in older females with multiple vaginal deliveries.

Although patients with diarrhea seem to exhibit both subjective and objective evidence of defecatory disorders, they would not fulfill the Rome IV criteria of functional defecatory disorders, as they do not satisfy the required criterion of having constipation or constipation-predominant irritable bowel syndrome.⁸ Hence, further studies of defecatory dysfunctions in patients with chronic diarrhea might be of interest to recognize their possible coexistence and to support the development of more inclusive criteria for functional defecatory disorders.

One of the major strengths of this study is the inclusion of a large cohort of patients with chronic functional diarrhea. The study also provides important insights on the anorectal manometry and defecation proctogram findings in selected patients with chronic diarrhea. One limitation of our study is that the prevalence and detailed findings of DRE among the 1071 patients presenting with diarrhea were not recorded; patients were seen at a tertiary referral center with availability of advanced diagnostic procedures and likely a low threshold for testing and possibly more severe clinical manifestations that led to the referral. Another limitation is the retrospective and descriptive nature of

our study and, hence, the lack of the control arm. Furthermore, due to the observational nature of this study, the diagnosis was based on results from diverse diagnostic modalities with different testing performance characteristics. Notably, defecography is associated with poor interobserver agreement⁹ and is position dependent.¹⁰

Overall, this study has identified an under-recognized potential that spastic evacuatory dysfunction can occur in patients whose presenting symptom is chronic diarrhea. Restoring normal evacuation may provide additional relief of symptoms if aligned with effective management of the chronic functional diarrhea.

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Supplementary Materials

Material associated with this article can be found in the online version at <https://doi.org/10.1016/j.gastha.2022.03.004>.

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Abbreviations used in this paper: DRE, digital rectal examination

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The corresponding author, on behalf of all authors, jointly and severally, certifies that their institution has approved the protocol for any investigation involving humans or animals and that all experimentation was conducted in conformity with ethical and humane principles of research.

Data Transparency Statement:

All relevant data are included in the paper and/or in the on-line Supplemental Materials. Only deidentified participant data are provided. Additional related documents will be available, if deemed appropriate, by request to the senior author with investigator support, after approval of a proposal, with a signed data access agreement.