

# EDITORIAL

## Towards Improving Diagnosis of Dyssynergic Defecation: A Small Step or a New Paradigm?



Although bowel movements may be an afterthought for some, difficulty with defecation can be debilitating and limit success of traditional constipation treatments. Of the approximately 40 million Americans affected by constipation,<sup>1</sup> 1 in 3 fails to respond to first-line laxatives and fiber supplements.<sup>2</sup> In these patients who fail standard treatments, evaluation of the pelvic floor with anorectal manometry is crucial to diagnose this important, underidentified, and treatable type of constipation. In this issue of *Clinical Gastroenterology and Hepatology*, Shah et al<sup>3,4</sup> challenge long-held beliefs about the utility of traditional pelvic floor function testing and introduce a point-of-care device that could expedite diagnosis and treatment.

Successful defecation requires coordination of increased rectal pressure with simultaneous relaxation of the internal and external anal sphincters and puborectalis muscle.<sup>5</sup> First described in 1985, Preston and Scott described a group of patients with constipation that paradoxically contract, rather than relax, their pelvic floor muscles during defecation (Figure 1).<sup>6</sup> Estimates suggest that up to 50% of patients with constipation may have a functional defecation disorder,<sup>7</sup> which has been formally defined by the Rome IV diagnostic criteria and includes at least 2 of 3 of the following: (1) abnormal balloon expulsion test (BET), (2) abnormal anorectal evacuation pattern with manometry or anal surface electromyography, and (3) impaired rectal evacuation by imaging.<sup>8</sup> Despite its high prevalence in constipation, only 2% of patients with constipation undergo testing for dyssynergic defecation.<sup>9</sup> Identification of patients with dyssynergic defecation is critical to avoid unnecessary testing and ensure appropriate treatment. With regards to treatment, patients with dyssynergic defecation, as compared with other types of constipation, uniquely benefit from biofeedback/pelvic floor physical therapy.<sup>10</sup> Biofeedback/pelvic floor physical therapy is not only superior to laxative treatment for patients with dyssynergic defecation, but has also been shown to eliminate dyssynergia in up to 90% of patients.<sup>11,12</sup>

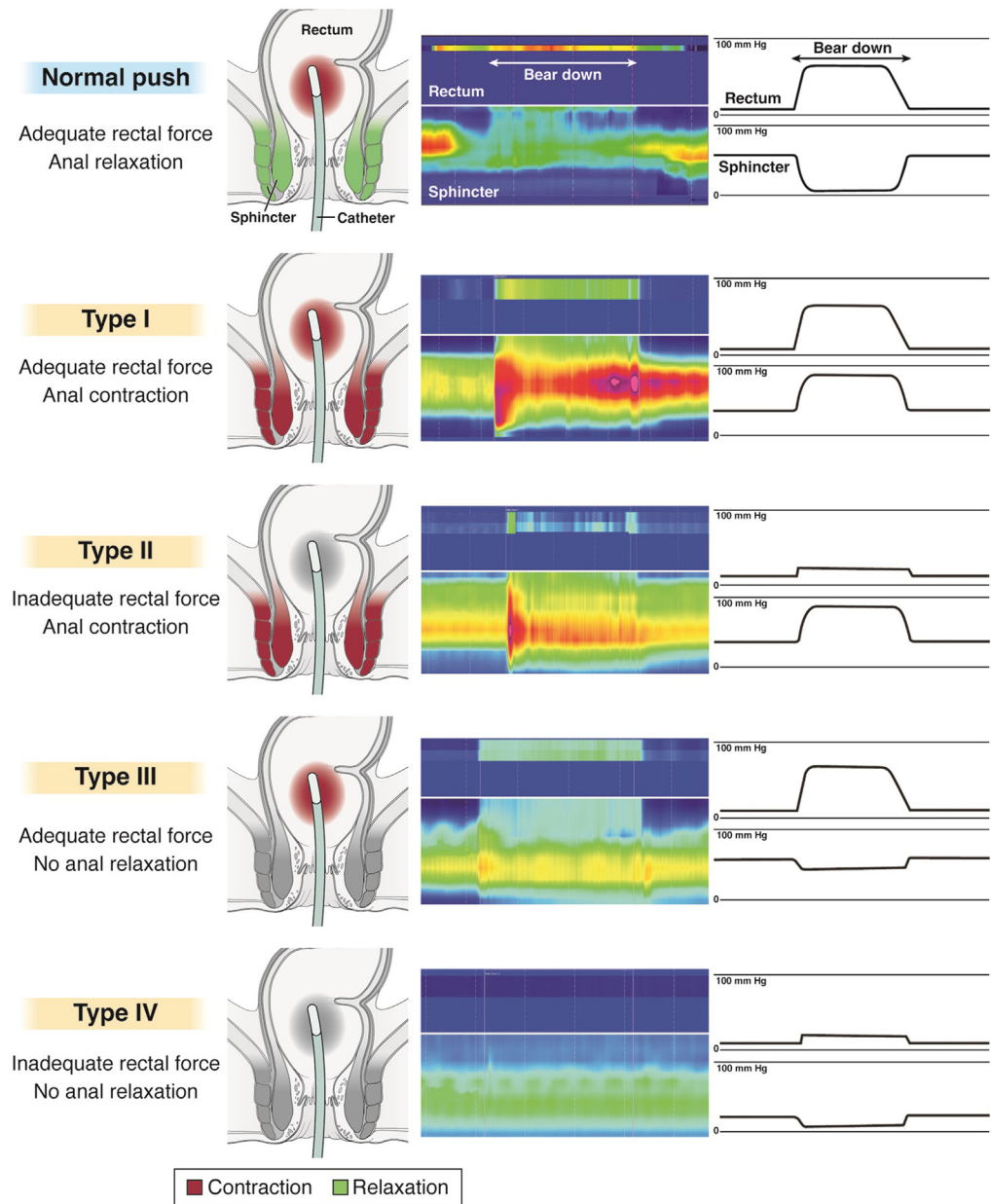
Identifying dyssynergic defecation can and should start in the first clinic visit for patients with chronic constipation. Typical anorectal symptoms include a need for digital facilitation of defecation, sensation of incomplete evacuation, sensation of blocked evacuation, and straining with bowel movements. Whether patients who describe these typical anorectal symptoms are more likely to have dyssynergic defecation is controversial, although some data would suggest that these patients

are more likely to respond to biofeedback/pelvic floor physical therapy.<sup>11</sup> Although seldom performed, a detailed digital rectal examination is essential and an experienced examiner may identify up to 73% of patients with dyssynergic defecation with a high positive predictive value.<sup>13,14</sup> Once suspicion is raised, the diagnosis is generally made by anorectal manometry with BET.

Anorectal manometry parameters that have traditionally been used to define dyssynergia include impaired anal relaxation, failure to increase rectal pressure, and a negative rectoanal pressure gradient during simulated evacuation (Figure 1).<sup>15</sup> However, validation and implementation of anorectal manometry for the diagnosis of dyssynergic defecation has not been without obstacles. Studies have shown that 70%–90% of healthy volunteers have an abnormal pattern of rectoanal coordination on anorectal manometry.<sup>16–18</sup> Such discrepancies have called into question the diagnostic utility of anorectal manometry. On one hand, trials using the established diagnostic criteria have shown that patients with dyssynergic defecation have a high response rate to biofeedback/pelvic floor physical therapy compared with those without.<sup>10</sup> On the other hand, the anorectal manometry parameters used to define dyssynergic defecation were defined by expert consensus and physiologic plausibility.<sup>19,20</sup> The ability of individual anorectal manometry parameters to predict response biofeedback/pelvic floor physical therapy has not been critically assessed.

As a result, many clinicians tend to rely on BET as a sort of shorthand in deciding which patients might most benefit from biofeedback/pelvic floor physical therapy, a limited resource in most of the world. BET involves instillation of a 50-mL fluid-filled balloon in the rectum with assessment of the time it takes for balloon expulsion in the seated position. A normal result is typically defined as <60 seconds,<sup>21</sup> although 120 seconds has also been proposed as a cutoff.<sup>22</sup> In a meta-analysis of 15 studies, a positive BET had 70% sensitivity and 77% specificity in identifying dyssynergic defecation.<sup>21</sup> However, despite reliance on balloon expulsion as a screening test for dyssynergic defecation, there is a similar paucity of studies assessing its ability to predict outcomes.

Regardless of validity, anorectal manometry with BET remains the gold standard for diagnosis of pelvic floor dyssynergia and is often the gatekeeper of referrals to biofeedback/pelvic floor physical therapy. However, availability of anorectal manometry is typically confined to academic medical centers. Community gastroenterologists and their patients alike may have limited access to anorectal manometry, leaving many patients without assessment of dyssynergic defecation and the potential benefits of treatment. Although validation of tests used to diagnose dyssynergic defecation is critical, a large-scale

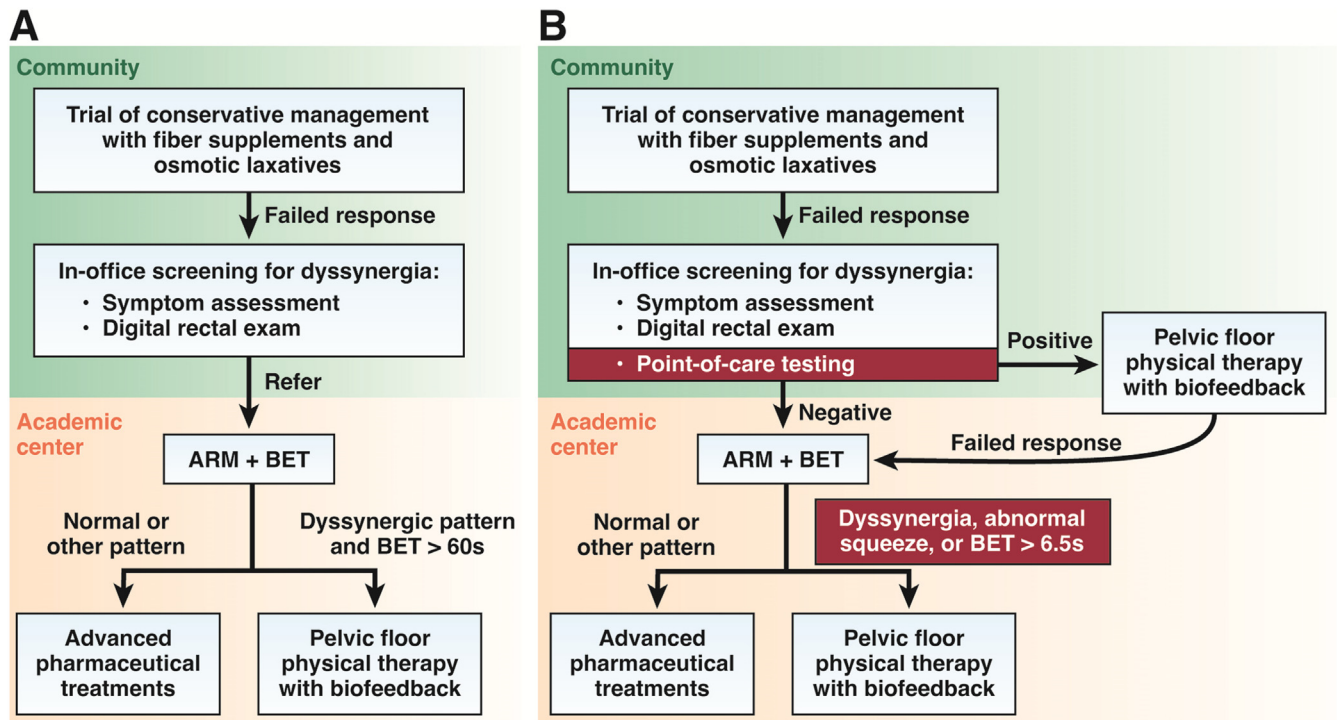


**Figure 1.** Physiology of normal and abnormal (dyssynergic) defecation. Pictorial representation (left), pressure heat maps (center), and pressure tracings (right).

impact on treatment of patients with chronic constipation hinges on access.

Here, in 2 complementary manuscripts, Shah et al<sup>3,4</sup> addressed these 2 key questions: does anorectal function testing inform clinical response to biofeedback/pelvic floor physical therapy; and can a standardized, point-of-care test effectively identify patients in the community who would benefit from biofeedback/pelvic floor physical therapy. These manuscripts detail the results from 2 analyses of a single, prospective clinical trial (N = 60 patients) in which the authors assessed the clinical utility of anorectal function tests (standardized anorectal manometry and balloon expulsion protocols; and a novel, point-of-care device) to identify patients with chronic constipation likely to benefit from biofeedback/pelvic floor physical therapy. All patients had failed at least 2 weeks of soluble fiber and osmotic

laxatives before physiologic testing. Patients underwent (1) anorectal manometry, (2) BET, and (3) point-of-care testing with the novel rectal expulsion device (RED). Regardless of outcome, patients were treated with standardized protocol for biofeedback/pelvic floor physical therapy. The primary outcome was clinical response, defined as a 75% improvement in Patient Assessment of Constipation-Symptoms instrument score. They found that the parameters that have been used to define dyssynergic defecation for decades (a dyssynergic pattern on anorectal manometry and balloon expulsion time >60 seconds) failed to predict clinical response to biofeedback/pelvic floor physical therapy. Surprisingly, squeeze pressure (sensitivity, 47.6%; specificity, 83.9%) and squeeze duration (sensitivity, 71.4%; specificity, 58.1%) independently predicted a higher response to biofeedback/pelvic floor physical therapy. Taken



**Figure 2.** (A) Current paradigm for diagnosis and treatment of dyssynergic defecation. Patients are referred for anorectal manometry (ARM) and BET before pelvic floor physical therapy with biofeedback. Criteria to treat include dyssynergic pattern (Figure 1) on ARM and BET >60 seconds. (B) Proposed paradigm by Shah et al.<sup>3,4</sup> Patients are screened for dyssynergic defecation with point-of-care testing (RED device) and if positive, are first treated in the community. If negative test or failed response, patients are referred to academic medical center for ARM and BET. Criteria to treat now include squeeze duration of <20 seconds and balloon expulsion time >6.5 seconds.

together, they found that the strongest predictor of clinical response was a squeeze duration of <20 seconds with balloon expulsion time >6.5 seconds.

In the second analysis, the authors report that clinical response to biofeedback/pelvic floor physical therapy was robustly predicted by the results of RED. In the left lateral decubitus position, abnormal device expulsion <5 seconds or >120 seconds predicted clinical response with a sensitivity of 95.2% and specificity of 32.3%. Test characteristics further improved by adding a subsequent seated maneuver for patients unable to expel the RED in 2 minutes.

This is one of the few clinical trials to evaluate how individual anorectal function testing parameters predict response to biofeedback/pelvic floor physical therapy.<sup>10,11</sup> In addition to its clear novelty and importance, the strengths of this trial lie in its design and standardization. These patients were treatment naive, allowing for the authors to assess for the benefit of biofeedback/pelvic floor physical therapy early in the patient's treatment algorithm. The authors created a standardized biofeedback/pelvic floor physical therapy treatment plan, including a detailed clinical protocol for potential reproduction elsewhere. This article may serve as a potential foundation for standardization of biofeedback/pelvic floor physical therapy treatment regimens, although we note that the 3 visits required by this study is less than standard (approximately 5–6).<sup>10,11</sup>

The key question then becomes how, and should, the authors' findings change practice? In the current guidelines, patients with constipation are first trialed on fiber supplements and laxatives. If no response, they are sent for anorectal manometry with BET, which then prompts referral for biofeedback/pelvic floor physical therapy if a dyssynergic pattern with abnormal balloon expulsion is identified (Figure 2A). The authors' results attempt to augment this paradigm in 2 places.

First, they propose that implementation of RED in the community gastroenterology office can be used to identify and triage patients who may respond to biofeedback/pelvic floor physical therapy without formal testing (Figure 2B). Although the authors note cost savings as a priority in RED integration into practice, they did not discuss whether upfront biofeedback/pelvic floor physical therapy is more cost-effective than upfront formal diagnostic testing. Furthermore, their study raises several questions about the validity of the RED results. Whereas RED accurately predicted clinical response, BET did not. In the few other trials evaluating clinical response, BET was one of the few parameters consistently associated with clinical response.<sup>10,11</sup> The devices are not identical, although we find it surprising that the small differences in balloon shape or compressibility could explain the dramatic difference in results. Future direct comparisons between RED and BET and

assessment of RED results in both healthy control subjects and in the tertiary care center patient population are needed.

Second, they propose new anorectal manometry parameters (squeeze pressure, squeeze duration, and squeeze duration of <20 seconds with balloon expulsion time >6.5 seconds) that better predict clinical response (Figure 2B). To define these parameters, they used 3-dimensional, high-definition anorectal manometry exclusively, whereas most centers use 2-dimensional, high-resolution probes. Although anorectal manometry results across techniques are correlated, variability exists.<sup>15</sup> Validation of these results using 2-dimensional probes is a necessary area of future work for the authors' results to be broadly applicable to all patients undergoing anorectal manometry. Furthermore, even though their study was powered to detect a difference in clinical response, it remains a small, single-center study. It can and should serve as a foundation for further outcome-driven studies of anorectal manometry across treatment settings.

The decision whether to refer a patient to biofeedback/pelvic floor physical therapy currently hinges on the results of anorectal manometry with BET, yet the standards for defining dyssynergic defecation are far from perfect, having been defined by consensus rather than outcomes. The barriers to proper treatment of dyssynergic defecation remain 3-fold: (1) inadequate screening of constipated patients for dyssynergic defecation in the community, (2) poor standardization and consensus on the best diagnostic modalities to identify dyssynergic defecation, and (3) limited understanding of which patients with constipation and dyssynergic defecation are more likely to benefit from treatment. Although the exact parameters predicting clinical response reported by Shah et al<sup>3,4</sup> require validation, these studies represent a significant step forward in the understanding of how physiologic testing may affect treatment decisions.

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**Conflicts of interest**

This author discloses the following: Kyle Staller has received research support from Ironwood and Urovant; and has served as a consultant to Arena, Boston Pharmaceuticals, Gelesis, GI Supply, and Shire/Takeda. The other author discloses no conflicts.

**Funding**

Kyle Staller is supported by NIH K23DK120945.

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<https://doi.org/10.1016/j.cgh.2022.06.036>