Are Pelvic Floor Movements Abnormal in Disordered Defecation?

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Pelvic floor movements were assessed by videoproctography in 126 subjects: neuropathic fecal incontinence patients (n = 44), chronic constipation patients (n = 52), and controls (n = 30). A significantly lower pelvic floor position at rest and a more obtuse anorectal angle were found in incontinent patients than in controls ($P < 0.01$). Constipated patients showed no significant difference from controls at rest. There was less pelvic floor movement during contraction in incontinent patients than in controls, indicating a flaccid, noncontractile pelvic floor in neuropathic incontinence. Movement during contraction in constipated subjects was also less than in controls. Changes in the pelvic floor position during straining were the same as in controls. These data indicate that the pelvic floor is flaccid and noncontractile in neuropathic fecal incontinence, which supports the concept of a progressive neuropathy involving the sacral outflow. Similar changes are not seen at rest in patients with constipation even though they have a long history of straining. [Key words: Videoproctography; Incontinence; Constipation; Defecation; Perineal descent]

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Abnormalities of pelvic floor function are thought to play an important role in the pathophysiology of disordered defecation. The pudendal neuropathy and obstructed defecation observed in patients with idiopathic fecal incontinence, rectal prolapse, or severe constipation have been attributed to increased perineal descent during straining.[1–3] Recent studies have failed to confirm this theory.[4, 5] Therefore, we have assessed pelvic floor movement using dynamic videoproctography in patients with disordered defecation.[6]

METHODS

Videoproctography was performed in 126 subjects: 52 constipated patients, 44 incontinent patients, and 30 controls. Diagnosis of disordered defecation was based on clinical findings, anal manometry, and electromyography. Control subjects were patients having herniorrhaphy, cholecystectomy, or mastectomy with no colorectal or anal symptoms. Because incontinent patients are usually older than those referred with constipation, two separate age- and sex-matched controls were needed (Table 1).

Videoproctography was performed using a known volume of contrast in the rectum with markers on the perineum, the symphysis pubis, and the coccyx as previously described. Pelvic floor position at rest was defined as the distance from the pubococcygeal line to the anorectal junction (Fig. 1). Assessment of pelvic floor movement was obtained by measuring the variation from the rest position to the positions achieved during maximum contraction (ascent) and attempted defecation (descent). The anorectal angle was measured between the longitudinal axis of the anal canal and the posterior rectal wall. Variation of the angle from the rest position was measured during contraction (closure) and attempted defecation (opening). Statistical analysis was performed using the Wilcoxon rank-sum test.

RESULTS

Pelvic Floor Position

The pelvic floor position in incontinent patients was significantly lower at rest compared with controls ($P < 0.01$). No significant difference was identified in the position of the pelvic floor at rest between constipated patients and controls. During contraction, there was significantly less pelvic floor movement in incontinent patients than in controls. The same observation was made among constipated patients during contraction, compared with controls (Table 2). There was less perineal descent during straining in the incontinent group, but this did not differ from controls. Although there was more perineal descent during straining among constipated patients, this may have been an age-related phenomenon as it did not differ from controls.

Anorectal Angle

Incontinent patients had a significantly more obtuse anorectal angle at rest than did controls

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Table 1.
Age and Sex of Clinical Groups and Their Controls

	n	Mean Age	Female	Male
Constipated	52	36.8	50 (96%)	2 (4%)
Control 1	18	38.0	16 (89%)	2 (11%)
Incontinent	44	52.0	38 (86%)	6 (14%)
Control 2	30	50.0	24 (80%)	6 (20%)

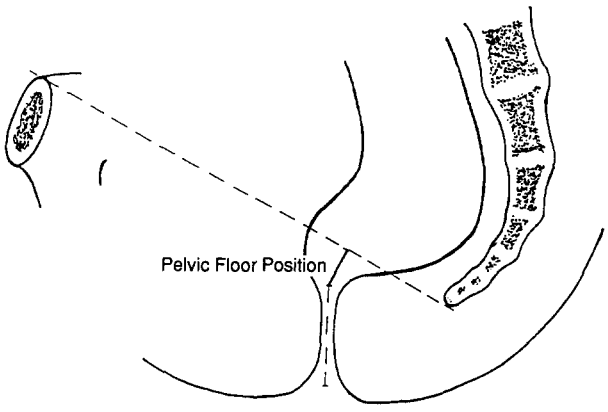

Figure 1. Pelvic floor descent is measured from the anorectal angle to the pubococcygeal line.

Table 2.
Mean Pelvic Floor Position

	Rest (cm)	Ascent (Contraction) (cm)	Descent (Straining) (cm)
Constipation	3.3	0.8*	3.1
Control 1	2.7	1.3	3.2
Incontinence	4.9†	0.6†	2.0
Control 2	3.2	1.1	2.6

* Difference from controls: $P = 0.06$.
† Difference from controls: $P < 0.01$.

Table 3.
Mean Anorectal Angles

	Rest (°)	Closure (Contraction) (°)	Opening (Straining) (°)
Constipation	82	17	7
Control 1	81	17	9
Incontinence	101*	7	9
Control 2	85	14	9

* Difference from controls: $P < 0.01$.

(Table 3) ($P < 0.01$). No significant difference was found in the anorectal angle at rest between constipated patients and controls ($P = 0.3$). No significant difference was found in the change of anorectal angle during straining or contraction between incontinent patients and their controls or between constipated patients and their controls.

DISCUSSION

This study suggests that patients with neuropathic fecal incontinence have features of pelvic floor failure. These patients have a significantly lower rest position and a more obtuse anorectal angle than controls. Furthermore, changes in the pelvic floor position during contraction are significantly weaker than in age- and sex-matched controls. These observations reflect a progressive neuropathy of the pelvic floor in these patients.[4, 7-10] No abnormality in pelvic floor position and anorectal angle was found in constipated patients at rest, but, as in incontinent patients, movements during contraction were significantly less than in controls.

Measurement of pelvic floor movement during straining revealed that, despite the muscular weakness evidenced at rest, incontinent patients had no increased descent compared with controls. On the other hand, as there was pelvic floor descent at rest, increased descent during straining may not have been possible in an already flaccid levator ani. Increased pelvic floor descent during straining was not found in constipated patients.

These observations provide a unique opportunity for studying pelvic floor dynamics in disordered defecation. Most studies rely on indirect measurement of perineal movement rather than changes in the position of the pelvic floor.

The findings of our study confirm that patients with neuropathic fecal incontinence have a weak pelvic floor, as evidenced by descent at rest and poor movements on contraction. Further descent of the pelvic floor on straining in incontinent patients was not seen, presumably because the pelvic floor was so stretched that further stretching was impossible. By contrast, patients with constipation, even though they all gave a history of straining, had no evidence of pelvic floor failure at rest. The only feature suggestive of a defective pelvic floor was the reduced movement on contraction. Clearly, the abnormalities in chronic constipation differ from those in incontinence. These data do not support the theory that progressive straining necessarily leads to pelvic floor failure and incontinence.

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