Original articles

Obstructive defaecation and slow transit constipation: the proctographic parameters

M. Papachrysostomou, A. N. Smith, M. V. Merrick

Departments of Gastroenterology, Surgery and Nuclear Medicine, University of Edinburgh, Western General Hospital, Edinburgh, UK

Abstract. Twenty-two patients with functional obstructive defaecation were compared with seven patients with slow transit constipation using isotope proctography. The obstructive defaecation patients were unable to perform a complete rectal evacuation (% of the activity evacuated: 54%). The defaecation time in this group was prolonged (120 s) with a lower defaecation rate (0.5%/s) compared with the slow transit constipation subjects (32 s and 1.8%/s). The anorectal angle (ARA) on straining did not change in the obstructive defaecation patients but became more obtuse in the slow transit constipation subjects (P < 0.02). The pelvic floor (PF) descent on straining and evacuation was greater in obstructive defaecation patients compared with the slow transit constipation ones (P < 0.01). Obstructive defaecation is characterised by prolonged defaecation and reduced defaecation rate compared with slow transit constipation. Obstructive defaecation patients present with more acute ARAs on straining, and abnormal perineal descent in contrast to the slow transit constipation ones.

Résumé. Vingt-deux patients souffrant de dyschésie ont été comparés avec 7 patients souffrant d'une constipation par ralentissement du transit au moyen d'une proctographie isotopique. Les patients souffrant de dyschésie sont incapables d'évacuer complètement leur ampoule rectale (54%). Le temps d'exonération de ce collectif était prolongé (120 s) avec une vitesse d'exonération inférieure (0,5%/s) comparativement aux sujets avec un ralentissement du transit (32 s et 1,8%/s). L'angle ano-rectal, lors de l'effort d'exonération, ne change pas chez les patients souffrant de dyschésie mais devient plus obtus dans le collectif de patients souffrant d'une constipation à transit lent (P < 0.02). L'abaissement du périène lors de l'exonération et de l'évacuation était plus important chez des patients souffrant de dyschésie que chez ceux souffrant de constipation avec ralentissement du transit (P < 0.01). La dyschésie est caractérisée par un allongement du temps d'exonération et une diminution de la vitesse de l'évacuation de l'ampoule rectale comparativement à la constipation avec ralentissement du transit. La dyschésie s'accompagne d'un angle ano-rectal plus aigu lors de l'exonération et d'une descente anormale du périène comparativement à la constipation à transit lent.

Constipation is not a disease but a symptom of several disorders. When conventional investigations reveal no organic causes [1], constipation is considered to be nonorganic, or functional [2]. There is no consensus regarding the pathophysiology of functional constipation; studies have suggested that it may be related to abnormally high sphincter pressures [3], an internal anal sphincter that fails to relax on rectal distention [4], impaired rectal sensitivity [5], reduced colonic propulsion [6], a functional obstruction of the sigmoid colon [7], failure of relaxation or paradoxical contraction of the puborectalis and/or external anal sphincter [8], or a combination of these abnormalities.

Dietary fibre has been regarded by many as a panacea in the treatment of constipation; however, some patients find that they are not helped by it and it may even make their symptoms worse [9]. Others remain resistant to all forms of treatment except enemas and large doses of saline cathartics and ultimately some require a colectomy to relieve the situation [10].

Two types of nonorganic functional constipation can be distinguished: the slow-transit type or colonic inertia and outlet obstruction or obstructive defaecation [8, 11]. The latter is an abnormal function of the pelvic floor muscles. Straining during defaecation provokes a contraction instead of relaxation of these muscles, thus creating a functional outlet obstruction. Slow transit constipation or colonic inertia is a common and serious problem in young women [12, 13], and may be identified by delayed transit of radio-opaque markers in the proximal colon [14]. Colonic motility does not seem to differ in
patients with slow transit constipation compared with normal controls [15]. Delayed transit of markers in the proximal colon, nonetheless may occur in functional obstruction of the distal colon [16].

The aims of this study were to characterise further the phenomena of nonorganic constipation and analyse its proctographic parameters qualitatively and quantitatively in functional obstructive defaecation in contrast to slow transit constipation.

Materials and methods

Subjects

Twenty-nine patients with functional constipation were studied, 25 of whom were women and 4 were men. Nine of the 25 women were nulliparous and females of child bearing age had the possibility of pregnancy excluded prior to the study. All had been assessed clinically by the referring consultant surgeon or gastroenterologist. Barium enema examination and sigmoidoscopy did not show any organic abnormalities. Objective evidence of severe constipation was obtained by estimating the delivery of radiopaque markers in the faeces after ingesting 50 plastic radiopaque markers. Two groups were recognised; one with normal transit of the radiopaque pellets through the large bowel and another with slow transit via the proximal colon. The former group of 22 patients, exhibited obstructive phenomena and were selected from the normal transit group study. The latter group of 7 patients, showed no functional obstructive phenomena but delayed transit along the length of the colon.

Patients with evidence of obstructive defaecation (OD). Eighteen of them were women (82%), and 4 were men (18%). The patients median age was 44 years (range: 36–46 years), duration of symptoms from 1 year to 33 years, and defaecation frequency from once in 2 days to no bowel movement without the help of laxatives/enemas. These patients had been having difficulty in evacuating the bowels, often irrespective of whether the stools were hard or loose. The patients complained of lack of responsiveness to laxatives or enemas (32%), incomplete evacuation (59%) and the feeling of obstruction at defaecation (27%). All patients described prolonged straining at stool despite an urge to defaecate, some having to resort to anal digitation to aid evacuation of stool (14%). Amongst primary complaints were abdominal pain (59%), abdominal distension (9%), nausea (5%) and perineal pain (64%).

Patients with slow transit constipation (STC). The second group of patients studied were constipated subjects who had been suffering from infrequent defaecation. This group consisted of 7 women with median age of 38 years (range: 30–56 years). These patients have suffered from constipation from 1 year to 20 years, with a defaecation frequency from one every 2 days to once a month. Four of them were on regular laxatives. All of them admitted straining at stool despite an urge to defaecate, some having to resort to enemas (32%), incomplete evacuation (59%) and the feeling of obstruction at defaecation (14%). All patients described prolonged straining at stool despite an urge to defaecate, some having to resort to anal digitation to aid evacuation of stool (14%). Amongst primary complaints were abdominal pain (59%), abdominal distension (9%), nausea (5%) and perineal pain (64%).

Methods

Dynamic scintigraphic proctography was performed in each patient. During this test the radiopharmaceutical used, approximately 200 MBq 99m-Technetium Methylene Diphosphonate (99mTc MDP) was prepared as described earlier [17]. After the insertion per rectum of the isotope 'potato paste' at a volume approximated to the maximum tolerable capacity, a Foley catheter (12 CH) filled with approximately 20 MBq 99mTc MDP, was used as the anal canal marker. With the patient seated upright on a commode at rest and following commands such as 'squeeze', cough, straining and evacuation. (y-axis) against defaecation time, in a single study. Evacuation begins at arrow

Fig. 1. Proctogram curves recording isotope activity in the anal canal, rectum and overall anorectum (y-axis) against defaecation time, in a single study. Evacuation begins at arrow

Statistical analysis

The statistical analysis of the results used the median values and their 95% confidence interval (CI), the Spearman's correlation coefficient and its p value, the non-parametric Mann-Whitney test for unpaired comparison and the sign test for paired comparison of observations.

Ethical permission

Ethical permission for this work was obtained from the Ethical Committee of the Lothian Health Board, Edinburgh. Informed consent was also obtained from all patients.

Results

Patients with OD features

The adequacy of rectal evacuation (%EVAC), the defaecation rate (%EVAC/sec) and the defaecation time involved were calculated as described in an earlier paper [17] (Fig. 1). The %EVAC was 54% (95% CI: 44, 72%), the defaecation rate (DRate) was 0.5%/s (95% CI: 0.2, 1%/s) and the defaecation time (DTime) was 120 s (95% CI: 52, 208 s).

Anorectal angles (ARA) in OD

The ARAs at rest, on squeezing, straining and evacuation referred to are the 'lower anorectal angles' (Figs. 2 and 3) i.e. the ones formed by the anal canal midline and by a parallel line to the posterior rectal wall. The ARA at rest was 103° (95% CI: 92°, 106°), the ARA on squeezing was 112° (95% CI: 96°, 117°) and on evacuation the ARA was 126° (95% CI: 120°, 131°).

![Proctogram curves recording isotope activity in the anal canal, rectum and overall anorectum (y-axis) against defaecation time, in a single study. Evacuation begins at arrow](attachment:proctogram.png)