Int J Colorect Dis (1988) 3:191–194

International Journal of Colorectal Disease

Original articles

Evaluation of perineal descent by defaecography

E. Skomorowska, V. Hegedüs and J. Christiansen

Department of Surgery D and Department of Radiology, Glostrup Hospital, University of Copenhagen, Copenhagen, Denmark

Abstract. Perineal descent was studied by defaecography with the patients in the sitting position in 55 healthy volunteers, 21 women with idiopathic faecal incontinence and 8 women with obstructed defaecation. This technique provides data necessary for the evaluation of defaecation disorders, i.e. morphological changes during defaecation as well as the dynamics of the pelvic floor. It was found that the pelvic floor position during rest and during straining is almost the same in women with incontinence and in women with obstructed defaecation. Furthermore patients with normal position of the pelvic floor during rest may exhibit considerable descent during straining while patients with abnormal position of the perineum during rest may show normal descent during straining. This observation may indicate that the first sign of abnormal function may be an increased descent during straining, only later following by descent during rest. The importance of establishing control data is emphasized since differences in defaecographic techniques between different centres may render comparison difficult.

Perineal descent is often present both in patients with anal incontinence and obstructed defaecation (outlet obstruction) [1, 2], and the surgical treatment of these conditions will in most cases have to include a procedure which reduces perineal descent. The position of the perineum should be studied with the subject in the sitting position in order to mimic physiological conditions, since a different perineal position and movement on straining is seen when the subject is studied in the horizontal position [2–6]. Detailed measurements of perineal descent during defaecography have not been done in previous studies [6–8]. We describe a technique employing a combination of static and dynamic tests which allows evaluation of the position and movement of the pelvic floor during rest and straining. This method has in a previous publication been used for evaluation of dynamic rectal pathology (internal intussusception, prolapse, rectocele, recto-sacral separation) and for measuring of the anorectal angle [9, 10].

Material and methods

Fifty-five healthy volunteers, 30 women (median age 54 years, range: 41–74) and 25 males (58 years, 38–71), 21 women with idiopathic faecal incontinence (59 years, 25–82) and 8 women with a history of obstructed defaecation (47 years, 29–83) were studied.

The control subjects were patients without defaecation disorders who for other reasons had been referred for a barium enema. The CD examination was performed on the same day and prior to the barium enema. Only those patients in whom the barium enema did not reveal any pathology were included in the series. Informed consent was obtained from all subjects.

Technique

Approximately 200 ml of a thick barium contrast medium (a mixture of equal volumes of Mixobar oesophagus® and Mixobar suspension®) were instilled through a catheter into the rectum. After the instillation the catheter was removed so that the anal canal was marked with contrast, as published by others [6]. The subject was then placed on a commode in front of a fluoroscopic unit, with the lateral view of the rectum positioned in the centre of the field. All stages of defaecation were registered on videotape and static images were taken at rest and during maximum straining. The x-ray machine used had a film-focal distance of 120 cm. The magnification of midline structures (rectum, anus) were measured using a metallic phantom – to 3 mm on average in the neighbourhood of the central beam.

Evaluation (Fig. 1)

Measurement of the position of the pelvic floor (perineal descent) at rest (D_R) was done on the static images. D_R is defined

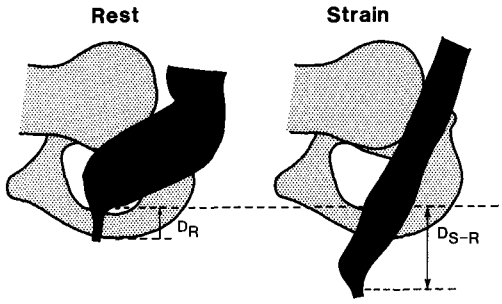

Fig. 1. Measurement of pelvic floor position at rest (D_R) and at strain (D_{S-R})

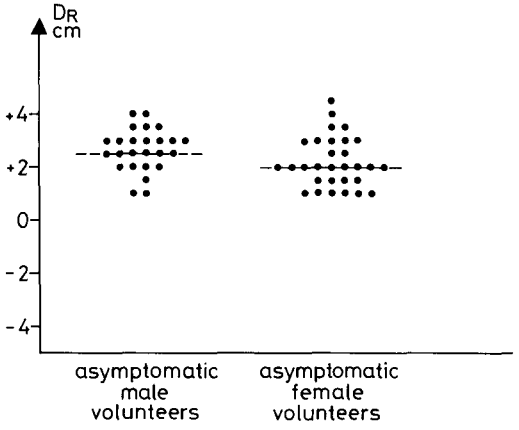

Fig. 2. Resting pelvic floor position (D_R) in relation to the ramus ossis ischii (cm) in asymptomatic control subjects

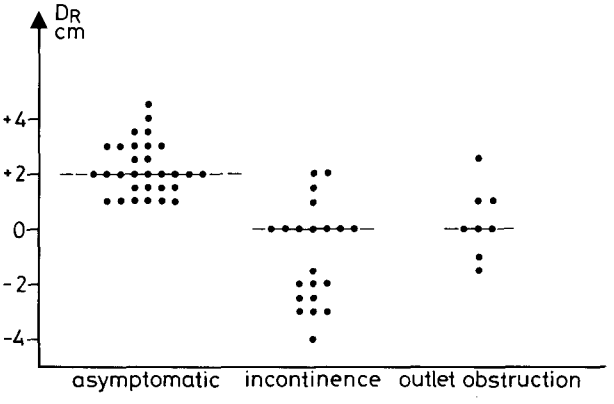

Fig. 3. Resting pelvic floor position (D_R) in women with faecal incontinence and outlet obstruction

as the distance in cm of the anorectal junction above (+) or below (–) the lower edge of the ramus ossis ischii measured at rest. D_{S-R} is the difference in cm between the level of the pelvic floor (the anorectal junction) at rest and during maximum straining. For this measurement the edge of the commode served as reference point since in some patients perineal descent during straining was so pronounced that the anorectal junction and the ramus ossis ischii were not visible on the video screen at the same time. Results are given as median with range (r) and 95% confidence limits (cf). Differences were assessed by the Mann-Whitney test and values less than 0.05 were considered significant.

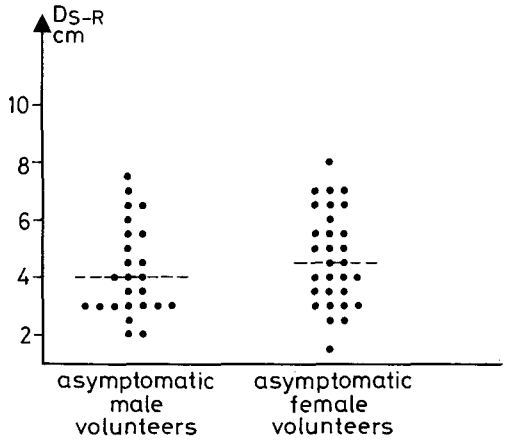

Fig. 4. Descent of the pelvic floor during straining (D_{S-R}) in asymptomatic control subjects

Table 1. Additional pathology revealed by the defaecography in women with faecal incontinence or outlet obstruction

	Incontinence	Outlet obstruction
None	6	1
Rectal intussusception	3	5
Rectal prolapse	7	0
Rectocele	5	2
Total	21	8

Results

The resting pelvic floor position in relation to the ramus ossis ischii (D_R) in asymptomatic women was +2.0 cm (r: +1.0 – +4.5); cf: +1.5 – +2.5) and in asymptomatic males +2.5 (r: +1.0 – +4.0; cf: +2.0 – +3.0); ($p=0.04$) (Fig. 2).

Females with faecal incontinence had a median D_R of 0 cm (r: –4.0 – +2.0; cf: –2.5 – 0), which is significantly lower than found in the control group ($p<0.01$). Women with outlet obstruction also had a D_R of 0 cm (r: –1.5 – +2.5; cf: –1.0 – +2.5) also significantly lower than the control group ($p<0.001$) (Fig. 3).

The descent of the pelvic floor during straining, i.e. the difference in the position of the anorectal junction at rest and during maximum straining (D_{S-R}) was in asymptomatic women 4.5 cm (r: 1.5–8.0; cf: 3.5–5.5) and in asymptomatic males 4.0 cm (r: 2.0–7.5; cf: 3.0–5.0); ($p>0.10$) (Fig. 4).

Women with faecal incontinence had a D_{S-R} of 7.0 cm (r: 2.0–13.0; cf: 4.0–9.0), and women with outlet obstruction 10 cm (4.5–13.0; cf: 8.0–13.0), both groups significantly greater than the control group ($p<0.02$). Descent during straining was sig-

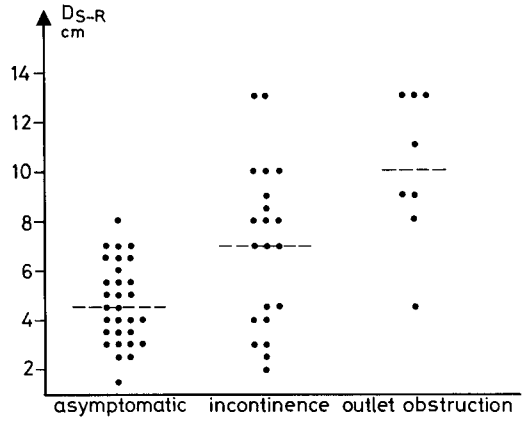

Fig. 5. Descent of the pelvic floor during straining (D_{S-R}) in asymptomatic women and women with faecal incontinence and outlet obstruction

Table 2. Pelvic floor position at rest (D_R) and during straining (D_{S-R}) in 21 female patients with anal incontinence

D_R, cm	D_{S-R}, cm
+1	10
+2	7
+2	7
+1.5	7
−2	4.5
−2	4
−2	4
−3	3
−2.5	2
−3	4.5
0	3
0	8
0	9
0	8
0	8
0	13
0	8.5
−3	10
−1.5	13
−2.5	10

Table 3. Pelvic floor position at rest (D_R) and during straining (D_{S-R}) in 8 female patients with outlet obstruction

D_R, cm	D_{S-R}, cm
+2.5	13
+1	13
+1	13
0	9
0	9
0	8
−1	4.5
−1.5	11

nificantly greater in women with outlet obstruction than in incontinent women ($p=0.025$).

Table 2 shows that a number of incontinent women have a normal pelvic floor position at rest (D_R) but an abnormal descent during straining (D_{S-R}). The same is true for women with obstructed defaecation (Table 3).

Discussion

Defaecography with the technique used in this study provides a number of data necessary for the evaluation of defaecation disorders in a single examination. In most studies where defaecography has been used, only the morphological changes during defaecation have been examined [1, 7]. In some studies anorectal angle but not pelvic floor descent were measured [6, 8], while measurement of perineal descent, if performed, was done in a separate examination using standard X-ray technique, often with the patient in the horizontal position [3, 4].

In previous studies on the position of the pelvic floor during straining [9, 10] we did not relate it to the position during rest, but according to our present experience, pelvic floor descent can only be evaluated by comparison of the movement of the perineum during straining with its original position during rest.

From the present study it appears that there is a small but significant difference in the position of the pelvic floor during rest between the sexes. During straining, however, no such difference was found.

Since there is no universal agreement as to the technical procedure for defaecography, values for pelvic floor descent obtained in different centres vary considerably [2, 3]. Position of the pelvic floor in relation to the ramus ischii during straining measured by Henry et al. [5] are not comparable with those found in this study, probably because of difference in procedure. One difference is that these authors examined the patients in the horizontal position in which maximum straining cannot be obtained, whereas our results were obtained during straining in the sitting position resulting in a greater descent. Similarly the difference in descent during straining between control subjects and patients was smaller than observed by us, and they did not find any difference in the position of the perineum between control subjects and patients at rest.

This indicates that unless the same technique is used in different centres, each centre has to collect

its own control data before measurements can be used to identify pathological conditions. This is furthermore emphasized by considerable overlap between values for normal individuals and patients in this study. Establishment of confidence intervals for control data makes identification of pathological conditions easier and more reliable.

Our study shows that the pathological values for pelvic floor position during rest (D_R) and during straining (D_{S-R}) are almost similar in women with incontinence and women with outlet obstruction. This is in agreement with previous observations that pelvic floor descent is probably an important common pathogenetic factor, which clinically can present either as incontinence or as outlet obstruction [1]. We found that some patients with normal position of the pelvic floor during rest showed increased descent during straining; this was seen in 37% of the patients with outlet obstruction versus 19% in patients with incontinence. Likewise some patients with abnormal position of the pelvic floor during rest showed normal descent during straining; this was seen in 33% of patients with incontinence versus 12% of patients with outlet obstruction. These findings indicate that the first sign of a pelvic floor abnormality may be increased descent during straining, only later followed by descent at rest, indicating that incontinence may be the end result of obstructed defaecation.

In conclusion defaecography performed with the technique described here gives information not only on the morphological changes during defaecation but also on the dynamic state of the pelvic floor. The importance of establishing reliable control data is emphasized.

References

1. Berman JR, Manning DM, Dudley-Wright K (1985) Anatomic specificity in diagnosis and treatment of internal rectal prolapse. Dis Colon Rectum 28:816–826
2. Parks AG, Porter NH, Hardcastle J (1966) The syndrome of the descending perineum. Proc R Soc Med 59:477–482
3. Bartolo DCC, Read NW, Jarratt JA, Read MG, Donnelly TC, Johnson AG (1983) Differences in anal sphincter function and clinical presentation in patients with pelvic floor descent. Gastroenterology 85:68–75
4. Bartolo DCC, Roe AM, Virjee J, Mortensen NJMcC (1985) Evacuation proctography in obstructed defaecation and rectal intussusception. Br J Surg 72:111–116
5. Henry MM, Parks AG, Swash M (1982) The pelvic floor musculature in the descending perineum syndrome. Br J Surg 69:470–472
6. Mahieu P, Pringot J, Bodart P (1984) Defecography: I. Description of new procedure and results in normal patients. Gastrointest Radiol 9:247–251
7. Broden B, Snellman B (1968) Procidentia of the rectum studied with cineradiography. A contribution to the discussion of causative mechanism. Dis Colon Rectum 11:330–347
8. Mahieu P, Pringot J, Bodart P (1984) Defecography: II. Contribution to the diagnosis of defecation disorders. Gastrointest Radiol 9:253–261
9. Mahieu PHG (1986) Defecography in anorectal defecation disorders. First Biennal Congress of European Council of Coloproctology, Bologna
10. Skomorowska E, Henrichsen S, Christiansen J, Hegedüs V (1987) Videodefaecography combined with measurement of the anorectal angle and perineal descent. Acta Radiol Diagn 28:559–562
11. Skomorowska E, Hegedüs V (1987) Sex differences in anorectal angle and perineal descent. Gastrointest Radiol 12:353–355

Accepted: 17 June 1988

Dr. John Christiansen
Department of Surgery D
Glostrup Hospital
DK-2600 Copenhagen
Denmark