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ORIGINAL ARTICLE

Rectocele or stool quality: what matters more for symptoms of obstructed defecation?

H. P. Dietz

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Abstract
Background Rectocele is a common condition seen in patients presenting with symptoms of obstructed defecation. We designed a prospective observational study to investigate the relative roles of rectocele and stool quality for such symptoms.
Methods Two hundred and forty-two women were assessed in a tertiary urogynaecological unit in a prospective observational study. History taking included questions regarding chronic constipation, incomplete bowel emptying, straining at stool and vaginal digitation, as well as symptoms of prolapse. Stool quality was assessed using the Bristol Stool Form Scale. Rectocele was diagnosed using translabial ultrasound and defined as a diverticulum of the anterior vaginal wall measuring 10 mm or more in depth.
Results The mean age was 53 (17–85) years. Patients reported frequent straining at stool (30%), chronic constipation (20%), vaginal digitation (15%) and incomplete bowel emptying (35%). Median stool quality was 4 (1–7). Ninety-seven women (40%) were found to have a true rectocele on imaging. Vaginal digitation was the only symptom significantly associated with true rectocele. Other symptoms of obstructed defecation were associated with stool quality rather than rectocele. Stool quality was not a confounder of the relationship between true rectocele and symptoms when tested by regression analysis.
Conclusions Stool quality seems to be of greater relevance in the aetiology of symptoms of obstructed defecation than the presence of a rectocele. This was true even when using imaging criteria for a true rectocele rather than just surface anatomy.

Keywords Imaging · Obstructed defecation · Prolapse · Rectocele · Translabial ultrasound

H. P. Dietz (✉)
Department of Obstetrics and Gynaecology,
Nepean Clinical School, University of Sydney,
Nepean Hospital, Penrith, NSW 2750, Australia
e-mail: hpdietz@bigpond.com

Introduction

Rectocele is a common condition seen in patients presenting with symptoms of prolapse and/or obstructed defecation. Gynaecologists diagnose a ‘rectocele’ on clinical examination and consider any downwards displacement of the posterior vaginal wall as ‘rectocele’ [1], although this often is an erroneous assumption [2]. Colorectal surgeons and gastroenterologists define a rectocele as a pocketing of the wall of the rectal ampulla, comprising both mucosa and muscularis, which is usually diagnosed on defecation proctography [3], and even gynaecologists have at times accepted defecation proctography as the gold standard for the diagnosis of rectocele [4]. Most such diverticulae occur in women, affect the anterior aspect of the rectal ampulla, and develop into the vagina. Some gynaecologists assume that the formation of a rectocele is due to a defect of the rectovaginal septum (RVS), first described in the early twentieth century [5], and they try to repair such defects [6] while others dispute the existence of the RVS as a surgically useful structure [7]. There is widespread disagreement over the optimal technique for surgically treating rectoceles, but in general both colorectal surgeons and gynaecologists would consider operating on a rectocele if the patient describes symptoms of obstructed defecation such as straining at stool, incomplete bowel emptying or vaginal digitation, and most gynaecologists would also

operate on a rectocele if the patient complains of symptoms of prolapse, i.e. a vaginal lump or a dragging sensation.

Recently, translabial ultrasound has been developed as an alternative technique to defecation proctography [8–13]. Although agreement between ultrasound and defecation proctography is not always very high [12–14], the former method is much cheaper and better tolerated by patients, making it useful as an initial investigative modality [12]. Similar to defecation proctography, maximal depth of a diverticulum can be measured, either during actual defecation [11] or during maximal Valsalva manoeuvre [15]. Although some investigators have used contrast medium for rectal filling [11], this does not seem to be necessary when relying on a Valsalva manoeuvre to open up the diverticulum.

The link between symptoms attributed to a rectocele and objectively demonstrated anatomical abnormalities is said to be weak [4], although by using ultrasound for the diagnosis of rectocele, the author has in the past been able to show a fair association between rectocele and symptoms of prolapse and obstructed defecation [16]. It seems reasonable to assume that stool quality—most likely as a result of individual differences in nutrition—might be a confounding factor in the relationship between morphological abnormality and symptoms. For this reason, a study was undertaken to examine the relative importance of stool quality as assessed with the Bristol Stool Form (BSF) Scale [17, 18] and rectocele presence and extent.

Materials and methods

This was a prospective observational study. Two hundred and forty-two women were assessed between December 2006 and March 2008 in a tertiary urogynaecological unit for symptoms of lower urinary tract dysfunction. A standardised history included questions regarding chronic constipation, incomplete bowel emptying, frequent straining at stool and vaginal digitation, as well as symptoms of prolapse. We did not attempt to quantify the severity of these symptoms. Stool quality was assessed by the patients themselves, using the BSF Scale [17]. If patients gave a range (e.g. from 3 to 6), the mean (e.g. 4.5) was recorded. Translabial ultrasound for the diagnosis of rectocele was performed using a variety of commercial 2D and 3D capable equipment as previously described [15], with the patient supine and after bladder and (if possible) bowel emptying. Findings were rated as positive for a true rectocele if a discontinuity was identified in the anterior rectal wall on Valsalva manoeuvre, resulting in a diverticulum of the anterior vaginal wall measuring 10 mm or more in depth ('true rectocele'). Figure 1 illustrates findings of a 'true' rectocele on defecation proctography and translabial ultrasound as described in reference [12]. We did not use ultrasound contrast medium. The ultrasound assessor was not blinded against stool quality or patient symptoms. Complex cases of obstructed defecation and those in whom an intussusception was suspected were referred to a colorectal colleague, but data on such assessments is not included in this study.

The data used in this analysis were obtained in the context of another, formally ethics-approved research project (SWAHS HREC 05-029). Statistical analysis was conducted using SPSS 13.0 for Windows (SPSS Inc, Chicago, Illinois, USA) and Minitab v.13 (Minitab Inc, State College, Pennsylvania, USA). All continuous data used in the analysis were normally distributed on Kolmogorov–Smirnov testing. The BSF Scale was treated as a continuous variable, as we allowed half-grades, resulting in a total of 13 possible data points.

Results

The 242 women had a mean age of 53 (17–85) years. Eighty-six percent were vaginally parous, and 69 (28%) had previously undergone a hysterectomy. Presenting symptoms were stress urinary incontinence (72%), urge urinary incontinence (60%) and symptoms of prolapse (43%). Symptoms of obstructed defecation such as chronic constipation, incomplete bowel emptying, frequent straining at stool and vaginal digitation were not the main presenting symptoms in this urogynaecological clinic, but they were reported by 126 women (52%); see Table 1 for a breakdown. Median stool quality was 4 [1–7], and 97 women (40%) were found to have a true rectocele on ultrasound. The depth of the diverticulum or pocket was measured between 10 and 46 mm.

Associations between symptoms of obstructed defecation and prolapse on the one hand and clinical rectocele or true rectocele as diagnosed on ultrasound are reported in Table 1. Clinical rectocele was weakly associated with symptoms of vaginal prolapse ($P = 0.003$), and vaginal digitation was the only symptom significantly associated with true rectocele ($P = 0.009$). However, the more symptoms of obstructed defecation were reported by a patient, the more likely was a true rectocele, especially when chronic constipation was omitted from the analysis. If one of the symptoms of incomplete emptying, frequent straining at stool and vaginal digitation was present, 14/63 (22%) of women were diagnosed with a true rectocele; with two symptoms, this rose to 22/42 (52%), and with three of those symptoms 12/16 (75%) of women showed a true rectocele ($P < 0.001$).

Stool quality, on the other hand, was strongly associated with straining at stool ($P < 0.001$), incomplete emptying

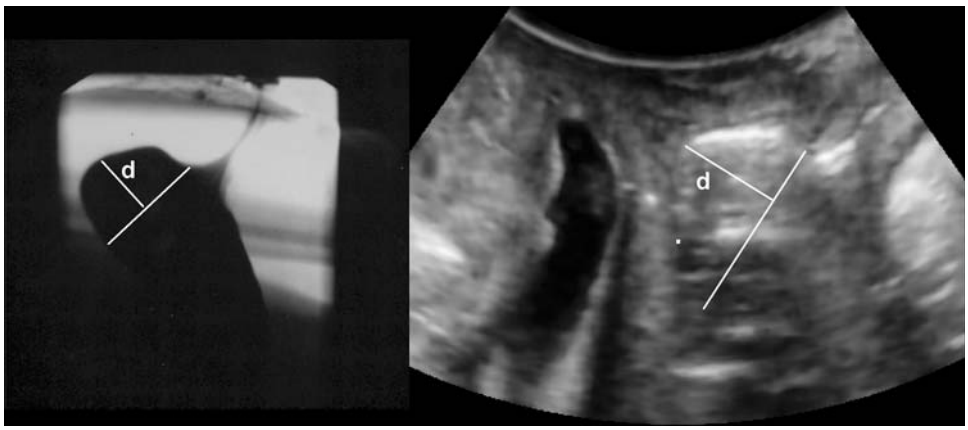

Fig. 1 A 'true' rectocele as imaged on defecation proctography (*left*, inverted for ease of comparison) and translabial ultrasound, midsagittal plane (*right*). '*d*' signifies the depth of the pocket, which was measured at 15 mm with both methods. (Reproduced from [12] with permission)

Table 1 The relationship between symptoms of obstructed defecation and the diagnosis of rectocele on clinical examination and on translabial ultrasound

χ^2 test for categorical variables, two-sample *t*-test for continuous variables

Symptom	*n*	%	Clinical rectocele grading	True rectocele ($n = 97$) on translabial ultrasound
Frequent straining at stool	73	30	NS	NS
Chronic constipation	56	23	NS	NS
Vaginal digitation	37	15	NS	22/37 vs. 75/205, $P = 0.009$
Incomplete bowel emptying	85	35	NS	NS
Any symptom of obstructed defecation	126	52	NS	NS
Vaginal lump	105	43	$P = 0.003$	NS

Table 2 The relationship between symptoms of obstructed defecation and prolapse on the one hand and stool quality on the other hand (two-sample *t*-test)

Symptom	*n*	%	Bristol Stool Form Scale
Frequent straining at stool	73	30	2.9 (SD 1) vs. 3.9 (SD 1.4), $P < 0.001$
Chronic constipation	56	23	2.9 (SD 1.4) vs. 3.9 (SD 1.1), $P < 0.001$
Vaginal digitation	37	15	NS
Incomplete bowel emptying	85	35	3.4 (SD 1.4) vs. 3.8 (SD 1.1), $P = 0.014$
Any symptom of obstructed defecation	126	52	3.4 (SD 0.9) vs. 3.9 (SD 1.4), $P < 0.001$
Vaginal lump	105	43	NS

($P = 0.014$) and chronic constipation ($P < 0.001$), but not with vaginal digitation or symptoms of prolapse (Table 2). There was a significant association between stool quality and rectocele depth ($r = 0.276$, $P = 0.006$) in those women who were diagnosed with a true rectocele on ultrasound, suggesting that stool quality influences functional anatomy, or at least its representation on imaging. However, stool quality was not a significant confounder of the relationship between true rectocele and symptoms when tested by regression analysis. Adding stool quality to a model containing any or all of the symptoms of obstructed defecation had only a marginal effect on the power of the model, which remained weak. There was no association between previous hysterectomy on the one hand and symptoms of obstructed defecation or stool quality on the other hand, arguing against any confounding effect of this variable.

Discussion

It is often assumed by gynaecologists that the co-existence of a rectocele and symptoms of obstructed defecation in a given patient means that the rectocele is responsible for the patient's anorectal symptoms. This definitely is fallacious if a 'rectocele' is diagnosed on clinical vaginal examination, as a number of more or less significant conditions may present as a 'bulge' of the posterior vaginal wall. Most prominent amongst them is rectal intussusception, which is routinely misinterpreted as a rectocele by gynaecologists and which cannot be detected by clinical examination [12]. Previously, the author has been able to show that a true rectocele, i.e. a diverticulum of the anterior rectal wall developing into the vagina, is associated with straining at stool, vaginal digitation and incomplete emptying [16], but the diagnosis of a 'true rectocele' requires imaging. True rectocele is common,

as shown on defecation proctography and on ultrasound, and it frequently occurs in asymptomatic women [16, 19], even in young nulliparous women [20]. It, therefore, appeared reasonable to assume that stool quality should be a major confounder in the relationship between symptoms of obstructed defecation. The assumption is that firm stool will require straining at stool, which will progressively enlarge a rectocele and fill it with rectal contents, making the patient strain more in a vicious circle, leading to the sensation of incomplete emptying and vaginal digitation.

The BSF Scale [17] is a simple visual scale that can be used to let patients estimate average stool quality on a 7-point scale from 1 ('hard lumps like nuts') to 7 ('entirely liquid'). It has been used extensively in gastroenterology and by colorectal surgeons and has been shown to correlate well with more objective measures of stool quality such as transit time [17].

In this study of 242 consecutive urogynaecological patients, the prevalence of symptoms of obstructed defecation was high (15–35% for individual symptoms, and 52% for any symptom), even if such symptoms were not the primary reason for presentation. This may limit the validity of our findings, and other results may be obtained in a group of patients primarily seen for anorectal dysfunction, such as in a colorectal referral practice, who are likely to present with a different mix of symptoms and anatomical findings. It is well recognised that rectocele is frequently associated with other anatomical or functional disorders [21], and the prevalence of either will depend on the individual practice. In particular, it is likely that a gynaecologist will mostly see patients with mild symptoms rather than those at the more severe end of the spectrum. This may explain that only vaginal digitation was associated with true rectocele in this series.

Despite the potential selection bias, however, it should still be possible to answer the main research question posed in this study, i.e. whether stool quality is a confounder in the relationship between symptoms of obstructed defecation and rectocele. Contrary to expectations, this does not seem to be the case. Stool quality, while being associated with all symptoms of obstructed defecation except for vaginal digitation, did not significantly affect this relationship. At any rate, the association between true rectocele and symptoms of obstructive defecation was substantially weaker in this series than previously observed using the same methodology [16], with only vaginal digitation reaching significance.

Our findings imply that successful rectocele repair should not be expected to alleviate symptoms of obstructed defecation, with the possible exception of vaginal digitation. Straining at stool and chronic constipation may not constitute an indication for rectocele repair, as these symptoms are more likely to be caused by issues unrelated to anorectal anatomy.

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