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ORIGINAL ARTICLE

Defecographic disorders in anal incontinent women: Relation to symptoms and anal endosonographic patterns

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Abstract

Objective. The need for a defecography in incontinent women is still debatable. We prospectively evaluated the prevalence of defecographic abnormalities in incontinent women in order to determine whether any symptom or endosonographic findings could be associated with a particular defecographic pattern. ***Material and methods.*** Fifty incontinent women (aged 30–87 years) underwent defecography and anal endosonography to look for pelvic floor descent, rectocele, intussusception, enterocele and the presence of anal sphincter defects. Other symptoms, i.e. straining at stools and pelvic pressure, were recorded. ***Results.*** Twenty-five cases of external sphincter defect (12 associated with an internal defect) and 4 cases of isolated internal defect were identified. Defecography identified 25 patients with perineal descent at rest, 28 with perineal descent at straining, 30 with rectocele, 30 with intussusception and 14 with enterocele. Three defecographies were normal. In the 29 women with sphincter defects, the prevalence of defecographic abnormalities did not differ from that observed in the 21 women without sphincter defects. In women complaining of straining at stools ($n=26$) or idiopathic pelvic pressure ($n=32$), the prevalence of defecographic abnormalities did not differ from that observed in women who did not have these symptoms. ***Conclusions.*** The prevalence of pelvic floor disorders in incontinent women was similar whether associated symptoms or anal sphincter defects were present or not. When defecography has to be performed to investigate female anal incontinence, neither clinical nor endosonographic features can predict a higher diagnostic efficiency.

Key Words: *Abnormalities, anal endosonography, anal incontinence, defecography, pelvic floor disorders, rectum*

Introduction

The assessment of anal incontinence is still difficult. Although anal endosonography has been used for several years to identify anal sphincter defects [1–3] and to evaluate anatomic reconstruction after sphincteroplasty [4–7], there is evidence that anal endosonography lacks specificity for the diagnosis of anal incontinence [8,9]. Moreover, it has been shown that management of anal incontinence based on sphincteroplasty alone is not completely effective, as demonstrated by the analysis of long-term results [10,11]. Focusing on anal sphincter defects carries the risk of underestimating pelvic floor disorders such as neuropathy secondary to a descending perineum. The descending perineum may be related to common aetiological factors with anal sphincter changes including ageing and obstetrical trauma or, more frequently, to chronic defecation disorders. Neuropathy in this situation is partly due to straining at stools and usually occurs before the development of anal incontinence in 30 to 60% of patients [12]. A surgical correction of a rectal intussusception has been shown to improve continence status [13], which suggests there is a benefit in correcting a pelvic floor disorder in the management of anal incontinence. As a consequence, the assessment of pelvic floor disorders in anal incontinence may be important in the decision-making process.

Defecography, combined with a clinical examination, appears to be the best way to characterize these pelvic floor disorders [14]. Recent reports have suggested that magnetic resonance imaging (MRI) acquisition performed with an endoanal coil allows also pelvic motion to be visualized in

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real time during defecation and may become a promising non-radiating tool [15–17].

The main difficulties are represented by the poor correlation between symptoms and defecographic disorders. Links between symptoms and defecographic findings are established only for distal constipation and pelvic pressure which are respectively related to anterior rectocele and enterocele [18,19]. In the assessment of anal incontinent patients, it has been suggested to limit the indication for defecography in incontinent patients complaining of distal constipation [18]. The aim of the present study was to establish a relationship between defecographic abnormalities and both sphincter defects and symptoms associated with anal incontinence in order to precise the indications for defecography in incontinent patients.

Material and methods

Patients

Fifty women (mean age 63.2 ± 12.3 years) suffering from anal incontinence were evaluated in our department. The patients had faecal (solid or liquid stool) incontinence more than once a week. The incontinence was considered as active in 38 women, passive in 8 and combined both clinical features in 4. Characteristics of surgical and obstetric history are summarized in Table I. Forty-four of the women had already given birth by vaginal delivery. Six of them had a history of proctological surgery. Twenty-six women complained of difficulties in evacuating stools independent of faecal consistency more than once a week. Idiopathic pelvic pressure was recorded ($n = 32$) in women complaining of periodic anorectal aching or fullness without signs of fissures or any other painful inflammatory or neoplastic disease. However, all these patients with the exception of two failed to reach the Rome criteria for irritable bowel syndrome.

Anal endosonography and defecography were performed independently for aetiologic assessment of anal incontinence by two investigators who were blinded to the results of the examination they did not perform.

Table I. Characteristics of obstetric and surgical history.

	n (%)
Vaginal deliveries	
At least one time	40 (80)
Two times	19 (38)
Three times	8 (16)
More than 3	18 (36)
Hysterectomy	19 (38)
Proctological surgery	6 (12)
Fistule-in-ano	1 (2)
Haemorrhoidectomy	5 (10)

Anal endosonography

All anal endosonographic procedures were performed by the same experienced operator using a type 1850 Bruel and Kjaer endorectal mechanical transducter (Naerum, Denmark) with a 360° rotative 7-MHz sensor covered with a hard plastic cone filled with water, 2 to 5-cm focal length. Patients were placed in left lateral position. The tip of the probe, placed in a condom coated with jelly, was introduced into the anal canal up to the anorectal junction and then gradually withdrawn. The criteria for a ruptured sphincter were the disappearance of a part of the circumference of the internal sphincter and the presence of a well-defined hypoechogenic area representing 15° or more of the whole circumference of the external sphincter. The location of defects was based on quadrants (anterior: right or left, posterior: right or left).

Defecography

All patients received a barium meal 1.5 h before being examined, to opacify the pelvic loops of the small bowel in order to detect enterocele. In the youngest women, defecography was always performed during the first part of the cycle. A lateral X-ray was performed for bone and pelvic loop visualization. A thick barium paste was injected into the vagina, to mark out the posterior vaginal wall. Then 150 ml of thickened high density and viscous barium contrast medium was inserted into the rectum of the patient in the left decubitus position. A radiopaque marker was placed close to the anus, to mark out the anorectal junction. Films were taken in a standing lateral position during the following manoeuvres: at rest, at voluntary and maximal contraction of the sphincter and pelvic floor ("squeeze"), at straining without defecation ("strain"). The pubococcygeal line was defined and the distance between this line and the anorectal junction (radiopaque marker) was measured. Finally, the patients sat on an upright commode attached to the footboard of the fluoroscopy table (a modified toilet) and rapid film sequences were taken at one frame per second at expulsion and after completion of defecation at maximum straining. Pathological patterns were defined as previously described [20]:

Pelvic floor descent was assessed from lateral films at rest and during straining. Perineal descent at rest was defined as a >3.5 cm distance between the anorectal junction and the pubococcygeal line. Perineal descent at straining was defined as a >3 cm distance between the anorectal junction and the resting position.

Rectocele outpouching of the anterior rectal wall was defined as a >3 cm anterior bulge of the rectovaginal septum at incomplete evacuation.

Intussusception: invagination of the rectal wall; either intrarectal, intra-anal or an external prolapse of the whole circumference

Enterocele: herniation of the lining of the peritoneum with the small bowel between the posterior vaginal wall and the anterior rectal wall.

Analysis

First, we compared the prevalence of defecographic findings in women with ($n=29$) or without ($n=21$) anal sphincter defect on anal endosonography. Secondly, we compared the prevalence of defecographic findings: i) in women suffering from pelvic pain ($n=32$) versus women without pain ($n=18$), ii) in women with difficulties to defecate ($n=26$) versus women with no difficulty ($n=24$).

Statistical analysis

Data were analysed using the GraphPad Prism (GraphPad Software Inc., San Diego, Calif., USA) statistical software package. Univariate associations were assessed using Pearson's χ^2 test as the first step of a regression analysis planned to include as candidates all items that were significant in the univariate tests. Three sets of a priori comparisons between observed prevalence of defecographic disorders were performed – present versus absent endosonographic defect, present versus absent difficulties to defecate, present versus absent complaints of pelvic pressure. *P*-values less than 0.05 were regarded as statistically significant.

Results

Anal endosonography showed 29 women with anal sphincter defect: 13 had external defects, 12 had both external and internal defects and 4 had internal defects. The external defects were localized in the anterior right quadrant ($n=8$), the anterior left quadrant ($n=2$), the anterior right and left quadrants ($n=3$). The internal defects were localized in the anterior right quadrant ($n=1$), the anterior right and left quadrants ($n=2$) or the posterior right and left quadrants ($n=1$).

Defecography showed 25 patients with perineal descent at rest, 28 with perineal descent at straining, 30 with rectocele, 30 with intussusception and 14 with enterocele. Three defecographies were normal. A leakage of barium in upright position was documented during the defaecography in 24 patients. In six patients, only one abnormality was identified (4 cases of intussusception and 2 cases of rectocele), while in the other 41 women, an association of abnormalities was found. The most common combination was perineal descent and rectocele ($n=21$), then perineal descent and intussusception ($n=19$). Rectocele without perineal descent was found in 8 women, all of whom had both incontinence and constipation.

First, we studied the results of defecography in the two groups for the presence or absence of an anal endosonographic defect. The groups were comparable for: 1) having given birth (18/21 versus 26/29; NS), 2) number of children (2.48 versus 2.21; NS), 3) a history of anal surgery (1/21 versus 5/29; NS). In women with a defect ($n=29$, 52%) we found: descending perineum at straining ($n=16$), descending perineum at rest ($n=12$), rectocele ($n=17$), intussusception ($n=20$) and enterocele ($n=7$). These prevalences did not differ from those observed in women without a defect ($n=21$, 48%): descending perineum at straining ($n=12$; $p=0.9$), descending perineum at rest ($n=13$; $p=0.3$), rectocele ($n=13$, $p=0.8$), intussusception ($n=10$; $p=0.15$) or enterocele ($n=7$; $p=0.6$) (Figure 1). Nor was any significant difference found for the association of abnormalities: descending perineum and rectocele (10/21 versus 11/29; $p=0.6$), descending perineum and intussusception (6/21 versus 13/29; $p=0.3$).

Secondly, we studied the results of defecography with regard to the presence of associated symptoms. Two of the 3 patients with a normal defecography had difficulties to defecate. In women with straining at stools, we found: descending perineum at straining ($n=12$), descending perineum at rest ($n=10$), rectocele ($n=19$), intussusception ($n=16$) and enterocele ($n=6$). These prevalences did not differ from those observed in women without this associated symptom: descending perineum at straining ($n=17$; NS), descending perineum at rest ($n=16$; NS), rectocele ($n=12$, NS), intussusception ($n=15$; NS) or enterocele ($n=8$; NS). Prevalence did not differ either in women complaining of idiopathic pelvic pressure ($n=32$) versus women without this complaint ($n=18$): descending perineum at straining (18/10; NS), descending perineum at rest (14/11; NS), rectocele (21/9; NS), prolapsus (20/10; NS) and enterocele (8/6; NS) (Figure 1). As neither

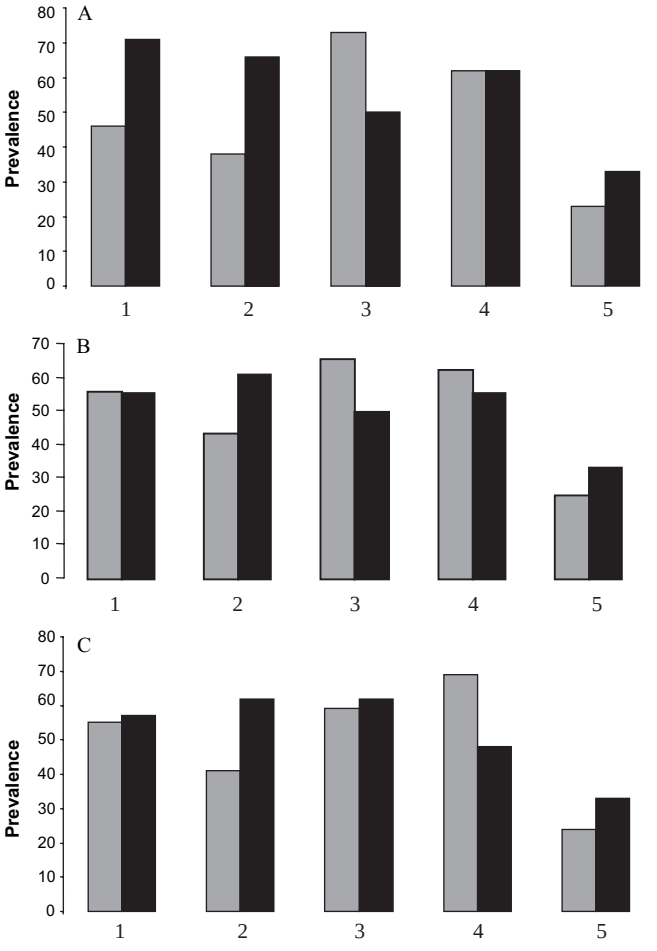

Figure 1. Prevalence of pelvic floor disorders on defecography in incontinent women with regard to the presence (grey bar) or absence (black bar) of difficulties to defecate (A, $n=26$), pelvic pressure (B, $n=32$), anal sphincter defect on endosonography (C, $n=29$).

endosonographic defect nor clinical symptoms were found to be significantly associated with a higher prevalence of defecographic disorders, the planned multivariate regression was not performed.

Discussion

Our study showed that neither symptom nor endosonographic pattern of the anal sphincter could i) predict the presence of specific defecographic abnormalities or ii) isolate a subgroup of patients in whom this examination could have a higher diagnostic efficiency.

After clinical examination, a radiological investigation is often necessary for the evaluation of anal incontinence. Fifty-eight percent of the women who were included in the present study had anal sphincter defects. This is an usual proportion in a population of incontinent women [1,2,8,21]. Nowadays, anal endosonography has become the gold standard for the diagnosis of anal sphincter disruption [1,22,23] and is able reliably to depict non-invasively the nature of anatomical sphincter abnormalities. Anal endosonography is also able to identify patients in whom surgical repair of the sphincter is likely to be useful, i.e. an external sphincter defect, or is unlikely to help, i.e. an isolated internal sphincter defect. If the role of anal endosonography is unquestionable in decision-making, the long-term results (40 months) of sphincteroplasty of the external sphincter remain disappointing since only 30% of operated patients are fully satisfied [10]. Our study did not show any significant association between defecography and anal endosonography patterns. The high prevalence of pelvic floor disorders observed may reflect two situations. First, it could be speculated that successive exposure to both numerous obstetric trauma and ageing, including menopause, may act as common aetiological mechanisms that could explain both late revelation of

sphincter damage and pelvic floor static and dynamic disorders. Secondly, this observation may provide an explanation for the relatively low rate of long-term success of sphincteroplasty as many of our incontinent women with anal sphincter defects met the usual criteria indicating sphincteroplasty.

Defecography is a minimally invasive, safe and simple procedure that provides valuable information about the dynamics of defecation. It evaluates anatomy and function of the anal canal and rectum and assesses movements of the pelvic floor. Caution is the rule when attributing a symptom to an abnormality, since many radiographic changes can be seen in asymptomatic, healthy subjects [14,20,24–27]. Moreover, it is easy to overdiagnose dynamic perineal descent, early rectoanal intussuception and a small rectocele. We used validated definitions of pelvic floor disorders to prevent as far as possible the description of small unrepresentative abnormalities [14,28]. Many promising results using MR imaging have been published recently [15–17]. This method provides a non-radioactive modality to measure both structural (i.e. anal sphincter, rectal wall and bladder) and functional pelvic floor disturbances in defecatory disorders [17]. Combined endoanal coil and fast acquisition will probably soon allow reliable MR defecatory evaluation. However, motion artefacts are not so easy to avoid and technical challenges remain [16]. However, no evidence is available to suggest that MR imaging findings will be related to symptoms.

Our second main result was to point out the lack of correlation between symptoms and defecographic disorders. Other investigators have found a poor correlation between defecographic measurements and clinical symptoms [29]. We confirm these previous data although our results are based on a relatively small number of patients, which constitutes a weakness. This small number of patients is mainly due to the fact that the first hypothesis tested was the link between sphincter defect and defecographic disorders and that to assess this point a group of 50 patients was able to detect a significant difference in prevalence of defecographic disorders. For the second question of our study, the obvious and well-known heterogeneity of symptoms, complaints and pathological findings in incontinent patients constitute a clear limitation at the time of the design of a prospective study. We decided to take all the symptoms into account in order to follow the clinical daily practice as closely as possible, while accepting a power weakness by the way.

The role of defecography in the management of anal incontinence is still being debated [18,20, 24–27,30]. Should defecography be performed in all incontinent women or in some of them selected on other clinical grounds? Rex et al. have suggested that useful information could be inferred from defecography in the population of incontinent patients with outlet obstruction constipation symptoms [18]. We did not confirm this data as there were no defecographic findings significantly associated with defecation troubles. We did not take the characteristics of incontinence, passive or active, into account in the present study. To address this important point, a stratification regarding type of incontinence is necessary to find any association between defecographic findings and subtype of anal incontinence symptoms. In regard to the proportion of both types of incontinence in our population, a two times larger study would have been necessary at least to test this specific point.

We did not separately analyse anal endosonography versus defecography. As a matter of fact, we do consider that these examinations offer complementary information about function and anatomy. When more widely available, MR imaging may provide information concomitantly on both procedures [17]. However, defecography could be useful when surgery of the sphincter does not yield the expected functional improvement and could be recommended before deciding on sphincteroplasty in order to improve the selection of patients as candidates for surgery. In the present report we did not address the final outcome of the patients after treatment and had no information on how defecographic abnormalities influenced the decision-making process in the patients.

In conclusion, we found no difference in the prevalence of defecography abnormalities regarding symptoms or anal endosonographic findings in a population of consecutive incontinent women. In female anal incontinence, the decision to perform a defecography cannot be based on any pattern of associated clinical symptoms or on the absence of anal sphincter defects in endosonography. On an individual basis, defecography is useful when showing rectal prolapse, a potential indication for rectopexy, or an associated enterocele, which is another key-point to guide surgery [13,19]. We recommend its use on an individual basis in the evaluation of invalidating anal incontinence referred to a tertiary care centre. However, the present study only provides information but no definitive evidence.

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