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## International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo



## CLINICAL ARTICLE

## Clinical significance of obstructive defecatory symptoms in women with pelvic organ prolapse

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## ARTICLE INFO

## Article history:

Received 22 February 2010

Received in revised form 8 June 2010

Accepted 4 August 2010

## Keywords:

Defecation

Pelvic organ prolapse

Rectocele

Splinting

Straining

## ABSTRACT

**Objective:** To determine whether the presence of obstructive defecatory symptoms is associated with the site and severity of pelvic organ prolapse. **Methods:** A cross-sectional study was performed of women with pelvic organ prolapse of grade 2 or greater who had completed a validated questionnaire that surveyed pelvic floor symptoms. Associations between patient characteristics, site and severity of prolapse, and obstructive bowel symptoms were investigated. **Results:** Among 260 women with pelvic organ prolapse, women with posterior vaginal wall prolapse were more likely to report obstructive symptoms, such as incomplete emptying (41% vs 21%,  $P=0.003$ ), straining at defecation (39% vs 19%,  $P=0.002$ ), and splinting with defecation (36% vs 14%,  $P<0.001$ ) compared with women without posterior vaginal wall prolapse. There was no significant association between any bowel symptom and increasing severity of prolapse. **Conclusions:** Obstructive bowel symptoms are significantly associated with the presence of posterior vaginal wall prolapse, but not with the severity of prolapse.

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## 1. Introduction

Pelvic organ prolapse is a common condition affecting as many as 38%–50% of women older than 40 years of age [1,2]. Known risk factors for the development of pelvic organ prolapse include age, ethnicity, parity, and vaginal delivery [1,2]. Women with pelvic organ prolapse may be asymptomatic or may report a variety of distressing pelvic floor symptoms involving urinary, bowel, or sexual functions that can lead to decreased quality of life and withdrawal from social activity [3–6].

Obstructive bowel symptoms previously reported in women with pelvic organ prolapse include straining, incomplete evacuation, and the use of digital manipulation with defecation [7]. Obstructive symptoms such as chronic straining during defecation have long been considered a risk factor in the pathogenesis of pelvic organ prolapse [8] and may persist even after corrective surgery [9]. Although previous studies have noted a high prevalence of obstructive defecatory symptoms in women with pelvic organ prolapse, the relationship between pelvic organ prolapse and obstructive defecatory symptoms remains unclear.

The aim of the present study was to determine whether the presence of obstructive defecatory symptoms is associated with the

site and severity of pelvic organ prolapse. Our hypothesis was that obstructive bowel symptoms are more likely to be present in women with posterior vaginal wall prolapse and in women with greater severity of pelvic organ prolapse.

## 2. Materials and methods

This cross-sectional study was conducted after it had received approval from the Institutional Review Board of the University of Pennsylvania School of Medicine. Eligible women who presented to a single, tertiary-care urogynecology office for initial evaluation of pelvic organ prolapse between August 1, 2007 and December 1, 2008 were identified by review of medical records and therefore, informed consent was not required. Women were included in this study if they had pelvic organ prolapse of grade 2 or greater in any compartment on pelvic examination and had completed a validated questionnaire surveying pelvic floor symptoms. Women were excluded if they had undergone anti-incontinence or prolapse surgery within the past year, had undergone previous bowel surgery, or had significant neurologic disease.

Data abstracted from patient charts included demographic information such as age, race, and body mass index (BMI, calculated as weight in kilograms divided by height in meters squared), and medical and gynecologic history such as menopausal status, previous pelvic surgery, and concomitant pelvic floor disorders. Vaginal examinations to determine the site and severity of pelvic organ prolapse were performed in the dorsal lithotomy position with an empty bladder and measured at maximal strain using the Baden-Walker halfway system [10]. The site of prolapse was defined using

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the terminology anterior, apical, and posterior vaginal wall prolapse as recommended by the International Continence Society [11]. The leading edge of the most severely affected compartment was used to assign the overall grade of prolapse. All vaginal examinations were performed under the supervision of a single examiner (the senior author). Urinary incontinence was diagnosed using the validated Questionnaire for Urinary Incontinence Diagnosis [12].

All of the women also completed the short form of the Pelvic Floor Distress Inventory (PFDI-20) [7], a condition-specific, validated, health-related quality of life questionnaire with 3 subscales, which is designed to evaluate distress caused by specific pelvic floor symptoms including urinary, bowel, and pelvic organ prolapse symptoms. Items on the PFDI-20 form first ask whether each symptom is experienced or not (“yes” or “no” response), and if “yes”, the degree of bother is assessed on a scale from 1 (not at all) to 4 (quite a bit). For this study, we defined a negative response as either the report of “no” for the symptom or the report of “yes” but with a degree of bother specified as “not at all” or “somewhat.” A positive response was defined as the report of “moderately” or “quite a bit” of bother.

The overall degree of bother attributed to 8 bowel symptoms in women with pelvic organ prolapse is described by the CRADI-8 (Colorectal Distress Inventory-8) bowel subscale score within the PFDI-20 [7]. The score ranges from 0 to 100, and higher scores indicate more severe bother. Obstructive symptoms measured were splinting, straining, or incomplete emptying with defecation.

Splinting with defecation has been reported to be present in up to 28% of women with pelvic organ prolapse [13]. Our sample size of 260 women allowed us to have power of 80% to detect an odds ratio (OR) of 3.0 or greater in the prevalence of splinting with defecation among women with advanced grade of prolapse (grade 3 or 4) compared with those with grade 2 prolapse, with a two-sided alpha of 0.05. We also had over 90% power to detect an OR of 3.0 or greater in the prevalence of splinting with defecation among women with posterior vaginal wall prolapse compared with those without, with a two-sided alpha of 0.05.

All statistical analyses were performed with STATA 10.1 (Stata Corp., College Station, TX, USA). Associations between site and severity of prolapse and individual bowel symptoms were investigated using non-parametric tests of trend and Pearson  $\chi^2$  or Fisher exact tests as appropriate. Associations between patient characteristics, site, and severity of prolapse and obstructive bowel symptoms were identified using independent *t* tests, Pearson  $\chi^2$  tests, and univariate and multivariate logistic regression. For multivariate regression analysis, all potential confounders of the association between the presence of posterior vaginal wall prolapse and obstructive bowel symptoms were initially placed in the model. A variable was retained in the final model if it was associated with the primary outcome (obstructive bowel symptoms) with  $P < 0.2$ , or if the variable was found to be a confounder of the relationship between the presence of posterior vaginal wall prolapse and obstructive bowel symptoms as determined by a change in the estimated OR of 15% or more. All reported *P* values were two-sided and  $P < 0.05$  was considered statistically significant.

### 3. Results

Of the 311 women who presented with at least grade 2 pelvic organ prolapse during the study period, 260 women met the eligibility criteria and were included in the analysis. Mean age, BMI, and parity for the whole cohort was  $60.5 \pm 12.5$  years,  $27.1 \pm 5.5$ , and  $2.6 \pm 1.3$  children, respectively. Additional demographic characteristics of the cohort are shown in Table 1. The majority of women were white (69%) and postmenopausal (79%). Only a small proportion of women used hormone replacement therapy ( $n = 27$ , 10%) or smoked tobacco ( $n = 15$ , 6%). Twenty-six percent of the women had undergone prior pelvic surgery, including hysterectomy, anti-incontinence procedure, or prolapse surgery. The most common type of prolapse was an apical

**Table 1**  
Demographic characteristics of the 260 women in the study.<sup>a</sup>

Characteristics	
Age, y	
<55	73 (28)
55–59	51 (20)
60–64	45 (17)
>64	91 (35)
Parity	$2.6 \pm 1.3$
Race	
African American	29 (11)
White	179 (69)
Other	29 (11)
Unspecified	23 (9)
BMI <sup>c</sup>	
<25	92 (35)
25–30	99 (38)
>30	60 (23)
Postmenopausal	205 (79)
Prior pelvic surgery	68 (26)
Urinary incontinence <sup>b</sup>	135 (52)
Stress UI only	29 (11)
Urge UI only	50 (19)
Mixed UI	56 (22)
Grade of leading edge of prolapse	
2	46 (18)
3	204 (78)
4	10 (4)
Presence of anterior prolapse	199 (77)
Presence of apical prolapse	224 (86)
Presence of posterior prolapse	59 (23)
No. of compartments with prolapse	
1	63 (24)
2	172 (66)
3	25 (10)

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); UI, urinary incontinence.

<sup>a</sup> Values are given as number (percentage) or mean  $\pm$  SD.

<sup>b</sup> Based on questionnaire diagnosis [12].

<sup>c</sup> BMI data were unavailable for 9 (4%) patients.

defect (86%) followed by an anterior wall defect (77%). Fifty-nine women (23%) had a posterior wall defect, and involvement of more than 1 vaginal compartment was noted in 76% of women. Only 63 women (24%) had a prolapse that affected 1 compartment only.

The prevalence of individual bowel symptoms did not vary by the severity of the overall grade of pelvic organ prolapse (Table 2). The most common bowel symptom reported was incontinence of flatus followed by obstructive symptoms including incomplete emptying, straining at defecation, and splinting with defecation. There was no significant association between any bowel symptom and increasing severity of pelvic organ prolapse.

The association of bowel symptoms with the site of prolapse is shown in Table 3. Obstructive symptoms, including incomplete emptying, straining at defecation, and splinting with defecation, and the sensation of tissue passing through the rectum were more common in women with posterior vaginal wall prolapse compared with women without posterior vaginal wall prolapse (Table 3). Anal incontinence, fecal urgency, and painful defecation were not significantly associated with the presence of posterior wall prolapse. There was no association between any bowel symptom and the severity of posterior vaginal wall prolapse (Table 4).

Characteristics of patients with obstructive bowel symptoms are shown in Table 5. Women with obstructive bowel symptoms were younger and were more likely to be overweight than women without these symptoms. The presence of obstructive bowel symptoms was also significantly associated with the number of vaginal compartments affected by prolapse, and the presence of posterior vaginal wall prolapse. We then examined the relationship between the presence of posterior vaginal wall prolapse and obstructive bowel symptoms while controlling for age, BMI, and the presence of apical or anterior vaginal wall

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