

Original Article

Vaginal Topography Does Not Correlate Well with Visceral Position in Women with Pelvic Organ Prolapse

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Abstract: The objective was to determine whether vaginal topography accurately predicts the location of the pelvic viscera on fluoroscopy in women with pelvic organ prolapse. Eighty-nine women undergoing pre-operative evaluation for reconstructive pelvic surgery at a tertiary care referral practice formed the study population. Each woman completed a comprehensive urogynecologic history and physical examination, which included a quantified (POP-Q) assessment of her vaginal topography, as described by Bump et al. In addition each woman underwent pelvic floor fluoroscopy (PFF). Visceral sites were selected which corresponded clinically to the vaginal sites measured by the POP-Q. The most dependent portion of the bladder, small intestine, rectum and urethrovesical junction was measured. Twenty-five (28%) women had stage II prolapse, 34 (38%) had stage III prolapse, and 28 (32%) had stage IV prolapse. The remaining 2 women were symptomatic, with stage I prolapse. For the entire study population there was no correlation between the fluoroscopic position of the small bowel and/or rectum and any apical or posterior wall POP-Q site (C, Ap or Bp). There was no correlation with the fluoroscopic position of the UVJ at rest or with straining and the corresponding POP-Q site (Aa). The fluoroscopic position of the most dependent portion of the bladder correlated only modestly with the upper (Ba, $\rho = 0.51$) and lower Aa, $\rho = 0.68$) anterior vaginal wall POP-Q sites. In women without prior surgery ($n = 33$) there was only modest correlation between the fluoroscopic position of the bladder and the corresponding POP-Q site (Aa, $\rho = 0.71$). In this unoperated subpopulation

there was no correlation with PFF and any other POP-Q site. In women who had undergone prior hysterectomy ($n = 25$) or hysterectomy with anterior and/or posterior colporrhaphy ($n = 17$), there was only a modest correlation of the most dependent portion of the bladder and the upper anterior vaginal wall site (Bb, $\rho = 0.67$ and $\rho = 0.55$, respectively). It was concluded that vaginal topography does not reliably predict the position of the associated viscera on PFF in women with primary or recurrent pelvic organ prolapse.

Keywords: Fluoroscopy; Pelvic organ prolapse

Introduction

Reconstructive pelvic surgery has a known failure/recurrence rate. A recent study by Olsen et al. [1] indicates that as many as 1 out of 9 American women undergoes surgery for urinary incontinence and/or pelvic organ prolapse during her life. At least 30% undergo more than one surgical intervention [1]. The possibilities for surgical failure or prolapse recurrence may be multifactorial, including patient tissue deficits (connective tissue and/or neuromuscular), inaccurate preoperative diagnosis, and ineffective surgical intervention. Physical examination of the maximum protrusion is the gold standard for preoperative evaluation for pelvic organ prolapse. Clinically, surgeons have extrapolated these topographic findings to suggest the location of the pelvic viscera. This study evaluates the accuracy of this assumption using a quantified grading system for pelvic organ prolapse and fluoroscopic imaging by examining the accuracy of one aspect of the physical examination.

Materials and Methods

Eighty-nine women undergoing preoperative evaluation for reconstructive pelvic surgery at a tertiary care referral practice form the study population. In addition to a comprehensive urogynecologic history and physical examination, the vaginal topography was quantified (POP-Q) using a previously described method [2]. POP-Q examinations were done in the supine and standing positions after the patient had confirmed the maximum protrusion of her prolapse, and specific sites were measured on the anterior, apical and posterior segments.

All patients also underwent pelvic floor fluoroscopy (PFF), as previously described [3]. In this technique, all pelvic viscera are opacified prior to fluoroscopic imaging of the maximal pelvic organ protrusion (while the patient defecates on a radiolucent commode in an upright, sitting position). Previous studies have shown that PFF significantly improves the diagnosis in women with pelvic organ prolapse [4]. Selected visceral sites were chosen based on our clinical impression of the site most likely to correspond to the vaginal site measured by the POP-Q. The posterior edge of the femur was selected as a stable bony landmark. The distance from this point to the most dependent portion of the bladder, small intestine, rectum and urethrovesical junction was

measured (Figs 1 and 2). The POP-Q measurements were not known to the investigator during the measurement of the films.

Non-parametric statistical analysis was used to identify any correlation between the POP-Q measurement on physical examination and the corresponding fluoroscopic measurements of the pelvic viscera. Forward and backward logistic regression as then used to see if any of the POP-Q measurements were clinically significant in predicting the presence of a rectocele, enterocele or cystocele. The significance level was reduced to 0.01.

Results

Eighty-nine women undergoing preoperative evaluation at a tertiary care referral practice formed the study population. Preoperative patients were selected consecutively when the POP-Q measurements were recorded in the chart and the PFF was technically sufficient for study measurements.

These women had a mean age of 61 years (range 36–80) with a mean parity of 3.4 (range 0–10). Seventy-seven women (87%) reported symptoms of pelvic organ prolapse. Stress urinary incontinence and urge incon-

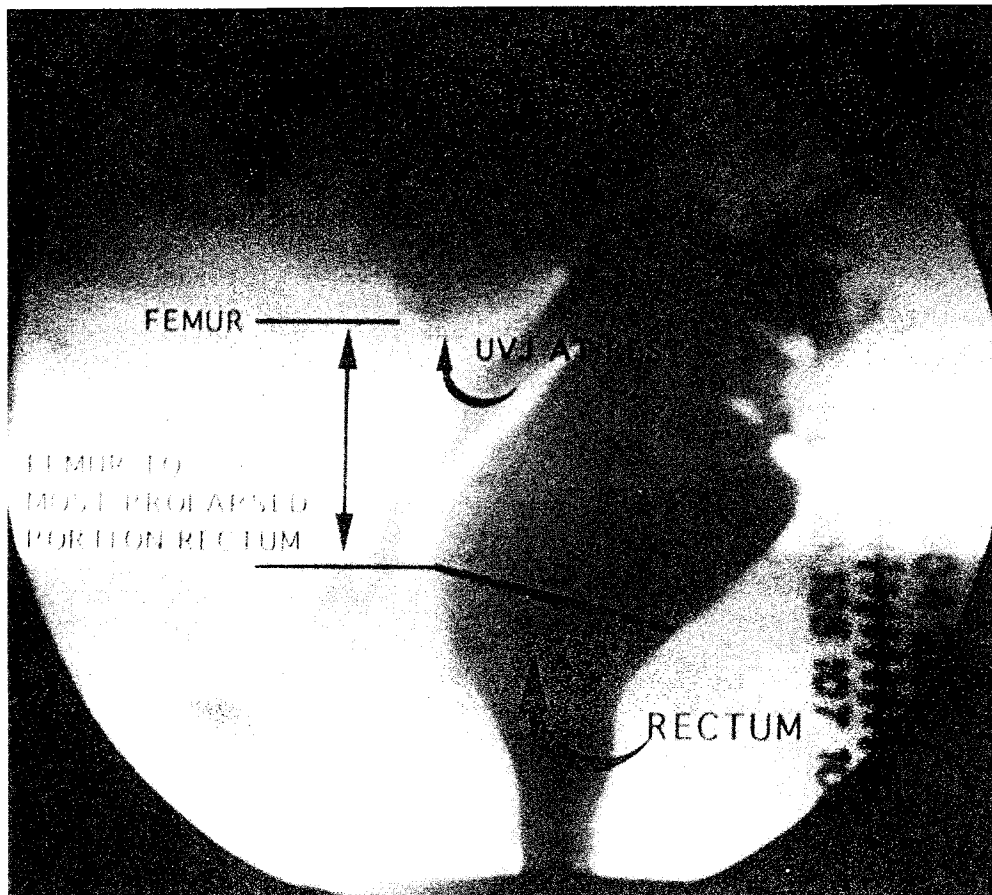


Fig. 1. Fluoroscopic image of a woman with her pelvic floor at rest. UVJ, urethrovesical junction.

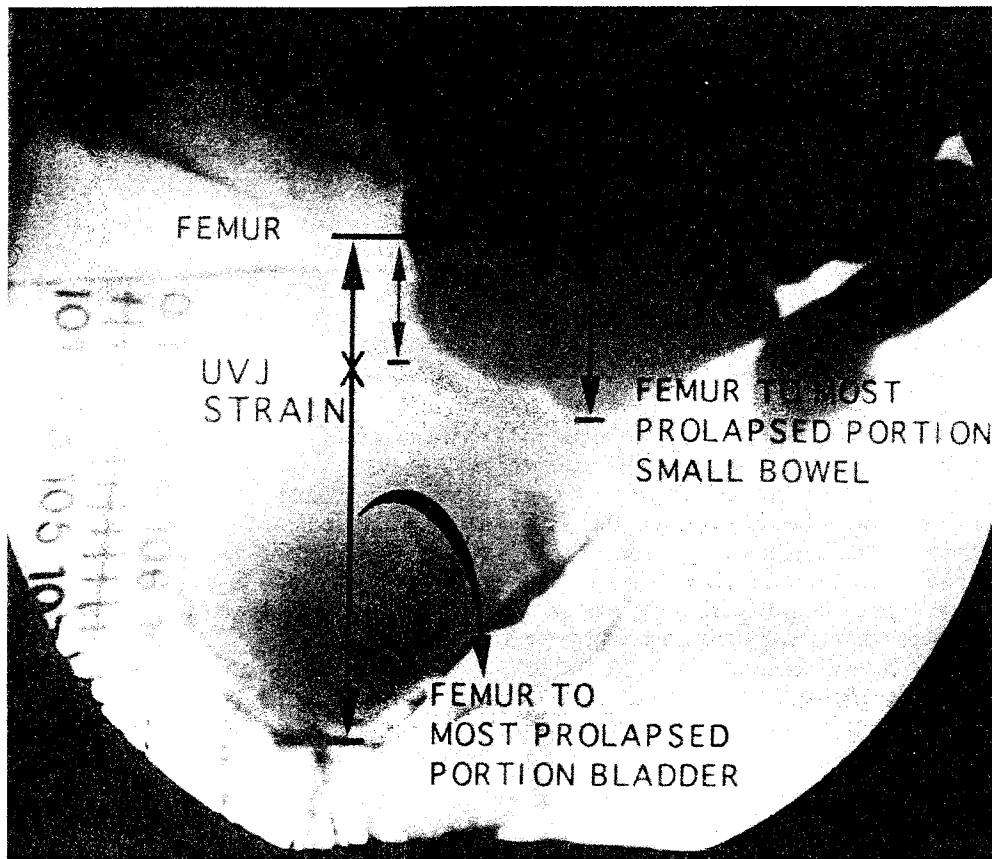


Fig. 2. Fluoroscopic image of the same woman as in Fig. 1, straining to create the maximum protrusion of her pelvic viscera.

Table 1. Pelvic floor symptoms

	Number of women	%
Prolapse	77/89	87
Stress incontinence	54/89	61
Urge incontinence	51/89	57
Fecal incontinence	24/89	27
Constipation	19/89	21
Manual evacuation	11/89	12
Voiding dysfunction	15/89	17
Defecatory dysfunction	17/89	19
Sexual dysfunction	24/89	27

tinence were common symptoms, reported by 54 (61%) and 51 (57%) women, respectively. Other symptoms commonly associated with pelvic floor disorders are listed in Table 1.

Twenty-five (28%) patients had stage II prolapse, 34 (38%) had stage III prolapse and 28 (32%) had stage IV prolapse. The remaining 2 women were symptomatic, with stage I prolapse.

For this entire population there was no correlation between the fluoroscopic position of the small bowel and/or rectum and any apical or posterior wall POP-Q site (POP-Q sites C, Bp and Ap). On the anterior wall there was no correlation with the fluoroscopic position of the UVJ at rest or with straining and the corresponding POP-Q site (Aa). The fluoroscopic position of the most

dependent portion of the bladder correlated only modestly with the upper (Ba, $\rho = 0.51$) and lower (Aa, $\rho = 0.68$) anterior wall POP-Q sites.

Thirty-three patients had had no prior pelvic surgery, and there was only a modest correlation between the fluoroscopic position of the bladder and the distal, anterior vaginal wall POP-Q site (Aa, $\rho = 0.71$) in these patients. In this unoperated subpopulation there was no correlation between PFF and any other POP-Q site.

Forty-two women had undergone previous hysterectomy, with 17 having had concomitant anterior and/or posterior colporrhaphy. There was no correlation with the majority of the POP-Q sites and the PFF. There was only modest correlation of the most dependent portion of the bladder and the upper vaginal site. In women with hysterectomy and prior colporrhaphy, the correlation was 0.67 ($P=0.006$), whereas for women with prior hysterectomy only the correlation was only 0.55 ($P=0.006$).

The remaining 14 patients had undergone one or more pelvic reconstructive procedures. In this subgroup there was no correlation with any PFF measurement and the corresponding POP-Q site.

Stepwise forward and backward logistic regression was then used to determine whether any single or combination of POP-Q sites was clinically accurate in predicting the presence of rectocele, cystocele or enterocele. No POP-Q site was significant for predicting

enterocele and no posterior vaginal wall POP-Q site was significant for predicting rectocele. The distal anterior vaginal site did predict the presence of cystocele. However, as a single variable the sensitivity was 100%, the positive predictive value was 88% and the specificity was 0%.

Conclusions

There is no test that can replace the physical examination of the patient seeking relief from symptomatic pelvic organ prolapse. However, for both patients and surgeons the physiologic and financial cost of surgical failure and/or recurrence is disheartening. This study illustrates the diagnostic limitations of the physical examination.

When we initiated the study we anticipated that previously unoperated patients would have a clinically acceptable correlation between the fluoroscopic position of the viscera and the corresponding vaginal site. The poor correlation in even this previously unoperated group was surprising and disturbing. It appears to us that physical examination is insufficient for individualizing all aspects of reconstructive surgery. It is generally taught that support defects of the anterior vaginal wall are accompanied by cystocele, and that posterior wall defects indicate rectocele. The findings of this study question the accuracy of those assumptions.

Prior to recommending the widespread use of preoperative fluoroscopic imaging it will be important to determine whether reconstructive surgery, taking into consideration fluoroscopic findings, alters the existing failure/recurrence rates. Certainly there are limitations to fluoroscopic testing and quantitative topographic assessments that cannot replace findings obtained by the traditional gynecologic examination. This study suggests that this form of imaging may be an important adjunct to thorough physical examination.

References

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EDITORIAL COMMENT: The authors seek to evaluate whether physical examination of vaginal prolapse using the POP-Q test correlates with fluoroscopic findings of visceral position. Surprisingly, little correlation is found, even in previously unoperated patients. One reason for this lack of correlation between the two modalities of evaluation may lie in the use of two different fixed points of reference: the POP-Q examination uses the hymen as the fixed point of reference, whereas the investigators chose to use the posterior edge of the femur as a fixed bony point of reference when evaluating pelvic floor fluoroscopy in the same patient. The lack of correlation between visual inspection of vaginal wall prolapse and what lies deep to that prolapse should not be used to invalidate the use of the POP-Q as a means to evaluate pelvic prolapse. Rather, the findings support the premise behind the ICS/AUGS/SGS committee on pelvic organ prolapse, specifically that clinical pelvic examination of the vaginal walls looks at surfaces only, and as such cannot determine what, if any, organ lies deep to that surface.