

Vaginal opacification during defecography: utility of placing a folded gauze square at the introitus

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Abstract

We evaluated the value of placement of a folded gauze square into the urogenital introitus to improve vaginal opacification in 90 patients who underwent defecography. Of the 50 patients who retained the gauze in the introitus, 96% demonstrated excellent or good vaginal opacification. By contrast, only 75% of the 40 patients who lost the gauze during the study were able to achieve the same level of opacification. This difference was shown to be statistically significant ($p < 0.002$), suggesting that placement of a folded gauze square in the introitus limits loss of contrast from the vagina, which improves vaginal opacification.

Key words: Bladder, abnormalities—Defecography—Gastrointestinal tract, radiography—Intestines, abnormalities—Rectum, abnormalities—Vagina.

During defecography, vaginal opacification assists detection of a variety of pelvic floor pathologies. Rectovaginal separation suggests the presence of an enterocele or sigmoidocele [1]. Inferior displacement of the vagina may be due to a cystocele or pelvic floor prolapse [1]. Various methods have been described to help retain vaginal opacification during defecography, including placement of a folded gauze square into the introitus to limit the loss of barium instilled in the vagina [1]. The usefulness of this modification of the defecographic technique has not been proven, which is the purpose of this study.

Materials and methods

Over a 2-year period (November 1995 to November 1997), 90 defecograms were performed at our facility. All patients were female, with an

age range of 19–85 years (average = 55 years). A standard technique was employed comprising rectal opacification with 16 oz. of defecographic barium paste (Evacu-Paste 100, E-Z-EM, Westbury, NY, USA) and small bowel opacification with 32 oz. of 20% w/v barium sulfate suspension (Ultra-R, E-Z-EM). The vagina was opacified with 20 cc of 60% barium sulfate suspension (Liquid E-Z-Paque, E-Z-EM). A 4-in. gauze square was folded and placed between the labia along the length of the urogenital hiatus. Urinary bladder opacification is not routinely employed but is occasionally used in individual cases when clinically specifically requested. Defecographic filming was then performed in the lateral projection, with the patient seated on a commode (Brunswick chair, E-Z-EM), and imaging was performed with a General Electric Advantx fluoroscopic unit (General Electric Medical Systems, Milwaukee, WI, USA), with digital filming at 110 Kvp and 160 mA. Images were recorded with the patient at rest, while performing a squeeze maneuver, with straining, and with forced evacuation.

All these studies were reviewed by the three authors without knowledge of the clinical history or the original interpretation of the defecogram. For each case, it was noted if the gauze placed at the introitus was still present during defecographic filming. The folded gauze square becomes opacified with barium when the patient assumes an upright position. Presence during the defecographic procedure was determined by visualization of the opacified gauze. A judgment of the degree of vaginal opacification was made as none, good, or excellent. Opacification was judged as none if the vaginal outline became invisible during part of the examination. Opacification was considered good if the vagina remained visible but with decreasing density through the various stages of the examination (Fig. 1). Opacification was excellent if the density of vaginal opacification was maintained unchanged throughout the examination (Fig. 2). All these observations were initially made by the reviewers independently. When there was disagreement among the reviewers regarding any of these observations, the images were again reviewed and a decision was made by consensus.

Results

Of the 90 patients examined, 40 patients lost the gauze square from the introitus before completing the examination and 50 patients retained the gauze square (Table 1). Of the 50 patients who retained the gauze in the introitus, 48 (96%) demonstrated excellent ($n = 34$, 68%) or good ($n = 14$, 28%) vaginal opacification. By contrast, only 30

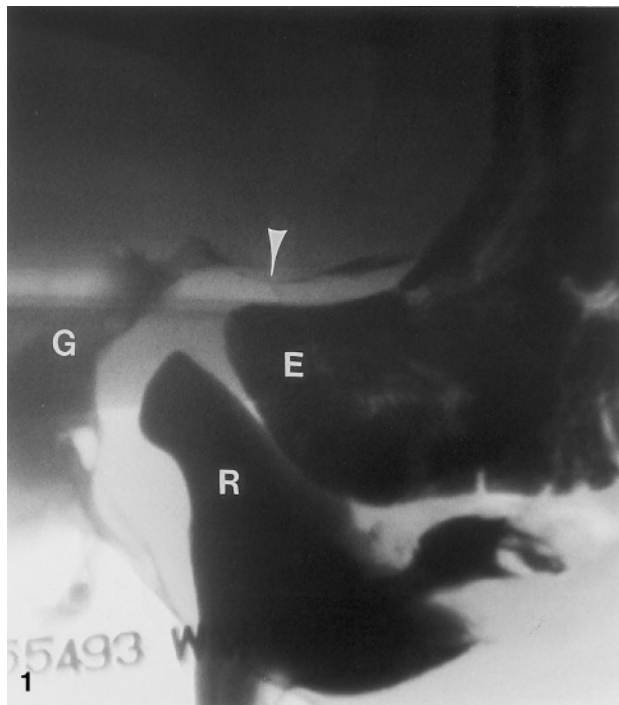
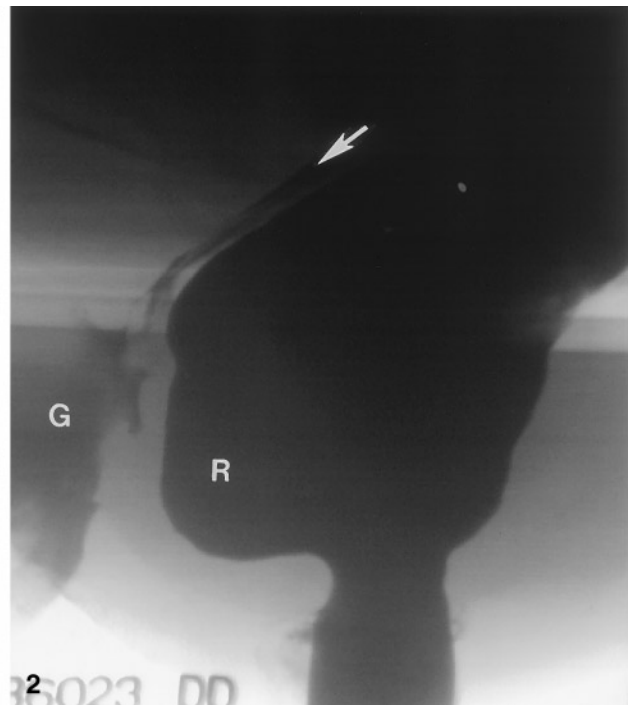


Fig. 1. A 60-year-old woman with feeling of incomplete rectal evacuation. End evacuation film of a defecogram shows good rectal emptying. There is a large enterocele (*E*) seen as loops of small bowel insinuating itself between the vagina and rectum (*R*). Vaginal opacification in this case is rated good because the vagina has remained visible, but a segment (*arrowhead*) has obviously decreased in density. This enterocele is reproducing the patient's symptoms of fullness in the perineum, which she interprets as incomplete rectal evacuation. Note the gauze (*G*)



in the urogenital introitus, which has been opacified by contrast emptying from the vagina.

Fig. 2. A 60-year-old woman with perineal discomfort after evacuation. Evacuation film shows development of a large anterior rectocele (*R*) that traps rectal content and cannot be evacuated. Vaginal opacification (*arrow*) is rated excellent because dense vaginal opacification was maintained throughout the examination. The gauze (*G*) is visible at the urogenital introitus.

(75%) of 40 patients who lost the gauze during the study were able to achieve the same level of opacification: excellent vaginal opacification ($n = 14$, 35%) or good ($n = 16$, 40%). This difference was shown to be statistically significant ($p < 0.002$) using Pearson's chi-square test.

Discussion

During defecography, vaginal opacification assists in the detection of a variety of pelvic floor pathologies. Opacification of the vagina is essential in cases of enteroceles to demonstrate the insinuation of small bowel loops between the vagina and the rectum (Fig. 1) [2]. A similar process can occur with the sigmoid colon forming a sigmoidocele, but this is far less common, occurring in only about 5% of patients with pelvic floor weakness [3]. A prolapsing uterus or a herniated mesentery or omentum may also fall into the widened rectovaginal gap [4]. Detection of these events require vaginal opacification throughout the defecographic examination because the prolapsing viscus may not migrate into the rectovaginal space until the final

Table 1. Quality of vaginal opacification versus retention or loss of gauze placed in the introitus

Quality of vaginal opacification	Gauze retained	Gauze lost
None	2	10
Good	14	16
Excellent	34	14
Total	50	40

Data are number of patients. Degree of vaginal opacification is rated as none, good, or excellent. These data were correlated with the presence (gauze retained) or absence (gauze lost) of the folded gauze square in the introitus during the examination

stages of evacuation. Should vaginal opacification become lost, rectovaginal gap widening will escape detection.

A rectocele is observed as a bulge (usually anterior) of the rectal wall beyond the extrapolated line of the normal wall (Fig. 2) [2]. Opacification of the vagina is not crucial to the detection of this common pelvic floor pathology but is of value in the understanding of the associated pelvic

floor prolapse by observation of changes in the vaginal angulation. Occasionally, the mass effect of the rectocele will result in dyspareunia, and in such situations, direct opacification of the vagina is of value in the appreciation of the extent of vaginal distortion created by the impressing rectocele. Similarly, a cystocele is optimally diagnosed with direct bladder opacification, but this requires the additional and somewhat uncomfortable procedure of catheterization by sterile technique of the bladder [3]. A cystocele may be inferred as a concave impression on the superior aspect of the vagina without having to opacify the bladder directly.

Shortening of the length of the vagina may occur in cases of genital prolapse. This phenomenon may result in reduced density of the vaginal opacification by reduction in vaginal volume as the vaginal vault migrates downward. External leakage will also occur as the vaginal introitus effaces with the prolapse. Any maneuver to maintain vaginal opacification would be useful to allow visualization of this change in vaginal morphology.

Various methods have been described to help retain vaginal opacification during defecography. Initially, tampons soaked in barium were used but this proved to be problematic because it sometimes had a pessary stenting effect that occasionally obscured pathology [5, 6]. A gel mixed with water-soluble contrast has been used with reported success [5]. A theoretical possibility of allergy to the iodinated contrast material then exists, as has been reported with oral contrast administration [7]. Some investigators have used a suspension of high-density barium, either alone or mixed with a vaginal gel [3, 8]. Some institutions do not routinely perform vaginal opacification. Placement of a folded gauze square into the introitus

to limit the loss of barium instilled in the vagina has been described but has not been proven to be of value in improving the examination [1].

The present results show that retention of the folded gauze square in the introitus does correlate with improved vaginal opacification. From this information, we conclude that placement of a folded gauze square in the introitus limits loss of vaginal contrast during defecography and improves vaginal opacification.

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