Midline Rectovaginal Fascial Plication for Repair of Rectocele and Obstructed Defecation

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OBJECTIVE: To estimate the efficacy of midline fascial plication of the posterior vaginal wall in women with rectoceles and obstructed defecation.

METHODS: Prospective evaluation of 38 consecutive women with symptomatic rectoceles (stage II or greater) and obstructed defecation included pre- and postoperative standardized pelvic floor questions, pelvic organ prolapse quantification measurements, validated bowel function questionnaires, defecating proctogram, and patient satisfaction. Reviews were conducted by nonsurgical coauthors.

RESULTS: The median follow-up was 12.5 months (range 2.5–26 months). The subjective success rates were 97% (95% confidence interval [CI] 0.83–1.00%) at 12 months and 89% (95% CI 0.55–0.98%) at 24 months. The objective success rates were 87% (95% CI 0.64–0.96%) at 12 months and 79% (95% CI 0.51–0.92%) at 24 months. The average points, Ap and Bp, were significantly reduced from −0.1 (range −2 to 3) and 1.1 (range −1 to 8), preoperatively, to −2.6 (range −3 to −1) and −2.5 (range −3 to 0), postoperatively, respectively ($P < .001$). Depth of rectocele also reduced postoperatively on defecating fluoroscopy ($P < .001$). The correction of the anatomical defect was associated with improved functional outcome, with 33 women (87%) no longer experiencing obstructed defecation, and there was a significant reduction in postoperative straining to defecate, hard stools, and dyspareunia ($P = .001$). The improved anatomical and functional outcomes were reflected in the fact that 97% of the women reported very high patient satisfaction.

CONCLUSION: Midline fascial plication is effective in correcting anatomical and functional outcomes associated with symptomatic rectoceles and obstructed defecation. (Obstet Gynecol 2004;104:685–9. © 2004 by The American College of Obstetricians and Gynecologists.)

LEVEL OF EVIDENCE: III

Posterior colporrhaphy remains one of the most common gynecological procedures performed in over 40% of women undergoing surgical correction of prolapse.[1] Obstructed defecation, defined as the need to use digital pressure in the vagina, perineum, or rectum to aid in bowel evacuation, is a common symptom experienced by 30% of women with uterovaginal prolapse.[2] Following constipation, obstructed defecation remains the most frequent bowel symptom in women undergoing posterior colporrhaphy. Although posterior colporrhaphy remains relatively effective in correcting the anatomical defect of the rectocele, the functional outcome has been variable.[3–5] The efficacy of posterior colporrhaphy to correct obstructed defecation in women with rectoceles varies widely from 37% to 100%[3–7] (Table 1). The relatively poor results have led to suggestions that obstructed defecation may not be amenable to surgical correction,[5] and investigations to exclude other causes of obstructed defecation, including mucosal rectal prolapse, internal intussusception, or anismus (paradoxical pelvic floor contraction at defecation), are appropriate before considering surgery.[2] Significant variability also exists in surgical technique, with some gynecologists plicating levator ani muscle,[4] some reattaching rectovaginal fascia to the perineal body,[5] and others repairing discrete defects in the fascia.[6,7]

Currently, the reconstructive gynecologist is unclear about the investigations that should be performed before considering surgery, the correct surgical technique to employ, and the outcome expected in women with rectocele and obstructed defecation. The aim of this study is to estimate the efficacy of midline rectovaginal fascial plication in the management of women with symptomatic rectoceles and obstructed defecation.

MATERIALS AND METHODS

Between January 2000 and December 2001, a prospective trial to estimate the efficacy of posterior colporrhaphy in the surgical management of symptomatic rectoceles and obstructed defecation was undertaken at the urogynecology outpatients departments of Royal Women's, Mater, and Wesley hospitals. Inclusion criteria were as follows: women with symptomatic prolapse; the point Bp (defined as the most distal position of any part

Table 1. Outcomes of Various Techniques of Posterior Colporrhaphy in Treating Obstructed Defecation

Author	n	Repair	Preoperative (%)	Postoperative (%)
Mellgren et al[3]	25	Fascia and LAP	48	0
Kahn and Stanton[4]	231	LAP		23
Kenton et al[5]	46	Fascia	24	15
Porter et al[7]	125	Fascia	24	14
Cundiff et al[6]	69	Fascia	39	25

LAP, levator ani plication.

of the upper posterior vaginal wall from the vaginal cuff of the posterior vaginal fornix to a point 3 cm proximal to the hymen) was at least 1 cm proximal to the hymen; and the need to use digital pressure on the vagina or perineum to aid in defecation on most days. Those requesting conservative treatment or those who were unfit for surgery were excluded. Thirty-eight consecutive women were eligible for inclusion and agreed to participate in the study. No women refused participation or were excluded after agreeing to participate.

Preoperative evaluation included a comprehensive standardized pelvic floor examination (prolapse was graded according to the International Continence Society's Pelvic Organ Prolapse Quantification),[8] completion of a structured, previously validated, bowel function questionnaire,[9] and fluoroscopic defecography as previously described.[10]

Surgery was performed with the patient in the dorsal lithotomy position. The posterior vaginal wall epithelium was incised longitudinally from the introitus to the vaginal apex. Using sharp dissection the surgeon opened the avascular plane between the vaginal epithelium and rectovaginal fascia to the medial aspect of the levator ani muscle. By using downward and medial traction on the rectum with the surgeon's nondominant hand, the retracted left proximal rectovaginal fascia was located approximately 3 cm inferior to and medial of the ischial spine and lateral to the rectum. This fascia was closed with polydioxanone sutures (PDS II; Ethicon, Somerville, NJ), and this was repeated on the patient's right. Before tying the first suture, traction was placed on the sutures to ensure adequate tissue strength. Suture pull-through at this time would suggest inappropriate suture placement or incorporation of the puborectalis muscle located inferior-lateral to the ischial spine. If the pubocervical fascia was plicated, the inferior margin was incorporated into the initial plication suture. The fascia was then plicated in 1-cm distal increments by using a continuous nonlocking suture, with minimal tension until the introitus. The rectovaginal fascia was reattached to the perineal body, which was reconstructed if deficient. The vaginal mucosa was closed with a continuous nonlocking Vicryl 2.0 suture and subcutaneous Monocryl 3.0 suture (both from Ethicon) to the perineum.

In vaginal reconstructive surgery, vaginal hysterectomy and anterior wall defects were repaired before performing the posterior repair. Enterocele sacs were ligated and sacrospinous colpopexy sutures secured after the dissection of the posterior vaginal wall and before the plication of the fascia. If concomitant abdominal surgery was required, the posterior repair was performed first. During surgery, intravenous antibiotics and antithrombotic agents were used, and stool softeners were administered postoperatively for a month. All surgery was performed by or under the direct supervision of C.F.M. The postoperative regime included minimization of all activity for 2 weeks, not returning to work for 6 weeks or athletic activities for 3 months, and the long-term avoidance of the lifting of weights greater 15 kg. Patients were advised to avoid constipation, but no further dietary advice was given.

Patients were reviewed at 6 weeks and 6 months, and every 6 months thereafter. The complete preoperative evaluation was repeated at 6 months by a nonsurgical coauthor, and at 6-month intervals the standardized pelvic floor questionnaires and Pelvic Organ Prolapse Quantification were repeated. Patient satisfaction was completed on a visual analogue scale of 0–100 as previously described.[11] Before prospective recruitment, local ethics review board approval was obtained (Royal Women's Hospital 1999), and all women consented to participate in the research.

Four studies have reported on women with rectoceles, with and without obstructed defecation, as part of larger reviews of posterior colporrhaphy.[4–7] These studies have included 11–30 women with preoperative incomplete defecation. In view of this, a minimum sample size of 30 women was deemed to be appropriate and achievable within our study guidelines.

The Wilcoxon signed rank test and McNemar test were used to compare continuous and categorical matched responses, preoperatively and postoperatively, respectively. Because of the variable lengths of follow-up, Kaplan-Meier survival analysis was conducted to investigate subjective (no symptoms of prolapse) and objective (points Bp and Ap, stages 0 or I) probabilities of success. Greenwood's formula was used to determine

Table 2. Demographic Characteristics of the Study Group (n = 38)

Age (y)	54 (33–86)
BMI (kg/m^2)	26 (20–38)
Parity	3 (1–5)
Menopausal	20 (71)
Hormone replacement therapy	16 (42)
Smoker	6 (16)

Data are expressed as median (range) or number (%).

95% confidence interval (CI). A significance level of 5% was used to define statistical significance for all calculations. All calculations were undertaken using SAS 8.2 (SAS Institute Inc, Cary, NC).

RESULTS

Patient demographics are presented in Table 2. Previous surgery includes 17 (45%) previous rectocele repairs, including 2 transanal repairs; 22 (58%) prior vaginal prolapse or continence surgeries; 20 (53%) hysterectomies, 11 abdominal and 9 vaginal; and 1 rectopexy.

Preoperatively, all women were aware of prolapse and used vaginal or perineal digital pressure to aid in defecation. Table 3 presents data about preoperative bowel symptoms, including straining to defecate (71%), hard stools (53%), and self-reported constipation (75%). The majority (71%) of women were sexually active, but many (37%) complained of dyspareunia.

Perioperative outcomes include mean operating time of 52 minutes (range 10–125 minutes), mean blood loss of 142 mL (range 0–400 mL), mean length of stay of 4.3 days (range 3–10 days), and length of time until return to activities of daily living of 23.4 days (range 7–56 days). As routinely seen in pelvic floor dysfunction, many women had multiple problems that required correction. The median number of concomitant surgeries was 2

for each woman (range 0–4); these included ligation of enterocele (25 women), sacrospinous colpopexy (18), laparoscopic colposuspension (13), anterior colporrhaphy (6), repeat retropubic continence surgery (5), vaginal hysterectomy (4), laparoscopic hysteropexy (3), tension-free vaginal tape (3), overlapping anal sphincter repair (1), and excision of sacrospinous sinus (1). Only one woman had a posterior repair performed in isolation.

The mean length of review was 12.5 months (range 2.5–26.0 months). The subjective success rate was 97% (95% CI 0.83–1.00%) at 12 months and 89% (95% CI 0.55–0.98%) at 24 months. The objective success rate 87% (95% CI 0.64–0.96%) at 12 months and 79% (95% CI 0.51–0.92%) at 24 months. The average points, Ap and Bp, were decreased significantly from −0.1 (range −2 to 3) and 1.1 (range −1 to 8), preoperatively, and −2.6 (range −3 to −1) and −2.5 (range −3 to 0), postoperatively, respectively ($P < .001$). The mean point Pb significantly increased from 2.0 (range 1 to 3), preoperatively, to 3.0 (range 2 to 4), postoperatively, ($P < .001$), and Gh alternatively decreased significantly from 3.8 (range 3 to 5), preoperatively, to 3.0 (range 2 to 4), postoperatively. Changes in Bp did not significantly correlate with any other concomitant posterior vaginal compartment surgery performed (enterocele ligation, $P = .06$; sacrospinous colpopexy, $P = .11$).

The improved anatomical outcome correlated with improved functional outcomes. After posterior colporrhaphy, 33 women (87%) no longer experienced obstructed defecation. Table 3 also reports a pre- and postoperative comparison of bowel, prolapse, and sexual function. Postoperatively, there was a significant reduction in awareness of prolapse ($P < .001$), obstructed defecation ($P < .001$), strain to defecate ($P < .001$), hard stools ($P < .001$), dyspareunia ($P = .001$), and digitation required ($P < .001$), and a significant increase in the

Table 3. Preoperative and Postoperative Pelvic Floor Measures*

	Preoperative (n = 38)	Postoperative (n = 38)	P†
Bowels open daily	25 (66)	38 (100)	< .001
Constipation	29 (76)	9 (24)	< .001
Hard stools	20 (53)	1 (3)	< .001
Strain defecate	27 (71)	4 (11)	< .001
Regular laxatives	13 (34)	12 (32)	.74
Digitation required	38 (100)	6 (16)	< .001
Stool incontinence > 1/mo	1 (3)	0 (0)	.32
Flatus incontinence > 1/mo	11 (29)	5 (13)	.08
Sexually active	27 (71)	28 (74)	.74
Dyspareunia	14 (37)	2 (5)	.001
Aware of prolapse	38 (100)	2 (5)	< .001
Obstructed defecation	38 (100)	5 (13)	< .001

Data are expressed as number (%).

* Includes validated bowel function questionnaire, prolapse, and sexual function.

† P values were calculated with the McNemar test.

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Table 4. Preoperative and Postoperative Measurements of Rectocele Depth, Decent Rectum, and Anorectal Angle at Rest and Straining

	Preoperative	Postoperative	P*
Depth rectocele (cm)	4.3 (0.3)	1.0 (0.2)	< .001
Descent rectum at rest (cm)	4.5 (0.5)	4.5 (0.4)	.69
Descent rectum straining (cm)	7.8 (0.5)	7.4 (0.5)	.06
Anorectal angle at rest (°)	109 (4)	111 (4)	.54
Anorectal angle straining (°)	127 (4)	128 (4)	.75

Data are expressed as mean (standard error).

  * P values were calculated with the Wilcoxon signed rank test.

number of women defecating daily ($P < .001$). The average number of bowel motions per week was 7.4 (range 2–25), preoperatively, and 8.4 (range 6–20), postoperatively, a difference that was not significant ($P = .43$). Dyspareunia decreased from 14 (37%) to 2 (5%), postoperatively. Of these 2 women, one developed de novo dyspareunia (1/24, 4%). Overall, 37 (97%) of the 38 patients reported a satisfaction with the surgery that was greater than or equal to 80 on a visual analogue scale, reflecting the improved anatomical and functional outcomes.

Nine women (24%) declined pre- and postoperative fluoroscopic defecography. Depth of rectocele was significantly reduced postoperatively on defecating fluoroscopy ($P < .001$), with little change seen in descent of the rectum at rest ($P = 1.00$) and with straining ($P = .06$) or in anorectal angle at rest ($P = .54$) and with straining ($P = .75$) (Table 4). Intussusception was present in 4 (14%) of 29 patients, both preoperatively and postoperatively ($P = 1.00$). Postoperatively, the 4 women had anatomical correction of the rectocele on examination and had resolution of the obstructed defecation. Three of the 4 women had persisting intussusception postoperatively. One woman developed an intussusception postoperatively that was not present preoperatively. Anismus has been identified as a potential cause of obstructed defecation that needs to be identified preoperatively. Anismus was not identified pre- or postoperatively in any patient on defecography.

Complications include 1 urinary tract infection, 1 inadvertent proctotomy closed intraoperatively without complication, and 1 rectovaginal hematoma, which settled without intervention. Three patients underwent further surgery, including 1 Fenton's repair (plastics procedure to widen the vaginal introitus) for superficial dyspareunia and 1 excision of perineal sinus. One woman underwent an enterocele repair at 3 months and had her postoperative evaluation completed before this surgery.

DISCUSSION

Obstructed defecation is a common symptom experienced by nearly one third of women with uterovaginal prolapse. The discrete fascial repair is a significant advance over the levator ani plication in the management of rectoceles because the anatomic defect is corrected without causing dyspareunia.[5–7] Unfortunately, obstructed defecation was corrected in fewer than 50% of patients undergoing a site-specific fascial repair.[5–7] Weber et al[2] suggested that women with significant bowel symptoms and rectoceles should have defecatory abnormalities excluded preoperatively and that prospective evaluation of these investigations were required to determine their efficacy.

We found the midline fascial plication to be highly effective in correcting the anatomical defect of the rectocele and the symptom of obstructed defecation. This is likely to be achieved because of the greater and more robust area of support offered to the posterior vaginal wall with the midline fascial plication than with a site-specific repair. The repair extends in continuity from 2 to 3 cm below and medial to the ischial spine to the perineal body and limits pocketing of the anterior rectum with straining, as quantified by the reduced rectocele on defecography. The reduced pocketing limits entrapment of feces and results in more complete rectal evacuation. Reduced bowel transit time may result in reduced fluid absorption and account for other improved postoperative functional bowel outcomes, including the reduction in hard stools and constipation and the increase in the number of women opening their bowels daily. Importantly the anatomic and functional outcomes were not achieved at the expense of increased postoperative dyspareunia, as with the levator ani plication.[4] Dyspareunia decreased significantly postoperatively. This may be explained by the following factors in the surgical technique: the anatomical nature of the surgery, no plication of the levator ani or transverse vaginae muscle, no excision of vaginal mucosa, and finally, the fact that the wide surgical dissection to the lateral pelvic floor may divide scar tissue associated with previous episiotomy or surgery. Over 60% of the women in the study had undergone previous vaginal surgery.

The preoperative defecating proctogram did not alter our surgical management of any patient. Testing re-

vealed 4 women with rectal intussusception and large anterior rectoceles. We explained to each women that we expected the surgery to correct the prolapse, although the symptom of obstructed defecation may persist postoperatively. All 4 women had an anatomical and functional correction of the rectocele, with 3 having persisting intussusception postoperatively. The defecating proctogram was of limited value to us preoperatively. We no longer routinely perform the test as a preoperative investigation in women with symptomatic rectoceles and obstructed defecation. Defining the clinical role of the defecating proctogram is difficult when high rates of abnormalities have been found in normal volunteers[12] and when only a limited correlation between clinical outcome and radiology has been reported.[10,13] Those with obstructed defecation without significant rectocele are sent for colorectal evaluation, which would include a defecating proctogram.

This study is a prospective case series, and during the study design we attempted to limit bias by including the use of reviews and examinations performed by nonsurgical coauthors, validated bowel questionnaire, and objective evaluation using defecography. Although the findings of this study that the midline rectovaginal fascial plication is effective in correcting anatomical and functional outcomes in women with rectoceles and obstructed defecation are potentially important, the small sample size and lack of a control group limit the generalizability of the findings. Many women underwent multiple surgeries concomitantly, including sacrospinous colpopexy, that may impact upon functional and anatomical results. A prospective randomized trial is required to compare the rectovaginal fascial plication to alternative interventions where concomitant procedures are stratified to ensure equal representation within each treatment group.

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