A Conservative Approach to Peritoneal Dialysis-Associated Rectocele

Pelvic organ prolapse occurs when the supporting muscles and connective tissues of the pelvic floor weaken. Prolapse is best understood as a vaginal hernia. The bladder (cystocele), rectum (rectocele), uterus (uterine prolapse), urethra (urethrcele), or small bowel (enterocele) can all prolapse into the vagina. Small bowel and peritoneum can also dissect into the rectovaginal space and apply extrinsic pressure on the rectum (peritoneocele). In its most severe form, these organs can prolapse past the genital hiatus and become exteriorized with valsalva.

Risk factors for pelvic prolapse include multiparity, vaginal delivery, and postmenopausal status. Like other hernias, activities which elevate intra-abdominal pressure like lifting, jumping, and having a chronic cough, as well as being obese, also put patients at higher risk for prolapse.

We describe 2 female patients with symptomatic rectocele and peritoneocele who receive peritoneal dialysis (PD). We believe the presence of long-term intraperitoneal dialysis fluid is a previously unreported risk factor for posterior compartment vaginal prolapse (rectocele and peritoneocele). Risk factors and treatment options will be discussed.

CASE 1

A 54-year-old African American female with end-stage renal disease (ESRD) from polycystic kidney disease had 2 pregnancies, both resulting in vaginal deliveries. She started PD at age 47. She weighed 114 pounds and measured 5 feet 8 inches tall. Her continuous ambulatory peritoneal dialysis (CAPD) regimen required instilling 2 L of PD fluid to perform 4 exchanges daily. She achieved adequate solute clearance as documented with a $Kt/V > 2$. Between the ages of 47 and 52, she had multiple gynecological issues including menorrhagia exacerbated by a submucosal fibroid. She subsequently underwent a thermochoice endometrial ablation and dilation and curettage. She had frequent episodes of constipation from using phosphate binders and eating a renal diet. At age 52, she noted a protrusion from her vagina during defecation and feelings of incomplete emptying. She was diagnosed with a stage 3 rectocele and peritoneocele, and a symptomatic perineocele (bulging of the perineal body with valsalva). Dissection of the peritoneocele into the deep rectovaginal space with compression of the rectum during defecation was

demonstrated on dynamic defecatory magnetic resonance imaging (MRI) (Figures 1 – 3). Figure 3 highlights a unique symptom of peritoneocele, namely incomplete fecal emptying.

Figure 1 — Sagittal MRI image of the pelvis with the peritoneal fluid in place prior to the patient's valsalva. MRI = magnetic resonance imaging.

Figure 2 — Sagittal MRI image of the pelvis during defecation. MRI = magnetic resonance imaging.

Surgical and conservative treatment options were discussed. Surgical options included vaginal and abdominal (laparoscopic) approaches to repair, either with or without the use of graft material. After considering the significant infectious risks associated with an intraperitoneal repair and the presence of PD fluid, we rapidly abandoned the idea of an abdominal or intraperitoneal vaginal approach, favoring instead a posterior vaginal extraperitoneal approach if surgery became necessary. The conservative option was to fit a pessary with the hope

Figure 3 — Dissection of the peritoneocele into the deep rectovaginal space with compression of the rectum immediately following defecation. Retained stool leads to sensations of incomplete evacuation. This leads to straining which exacerbates the peritoneocele and rectocele. MRI = magnetic resonance imaging.

that the patient's symptoms would be alleviated without the need for surgery.

Based on our hypothesis that PD fluid dissects into the rectovaginal space over time, the decision was made to modify her dialysis regimen and to fit a Gellhorn pessary. She was switched to automated peritoneal dialysis (APD) to decrease intra-abdominal pressure. She now performs nocturnal PD using a cycler. She carries only 500 mL of PD fluid during the day. Her Gellhorn pessary effectively relieves her posterior, perineal, and defecatory symptoms and she is able to remove the pessary intermittently herself for cleaning and intimacy.

CASE 2

A 65-year-old Hispanic female with ESRD from diabetes mellitus type 2 started CAPD at age 63. She weighed 180 pounds and measured 4 feet 7 inches tall, resulting in a body mass index of 41.8. Her abdominal circumference measured 48 inches. She had 10 pregnancies with 8 vaginal deliveries and 2 caesarean sections. She reported frequent episodes of constipation from using phosphate binders and eating a renal diet.

Four months after starting PD, she complained of 'fullness in her private area.' Rectocele was diagnosed by physical examination. She was switched to APD with dry days. Similar treatment options were discussed. She currently practices Kegel exercises to strengthen her pelvic floor and is considering whether further treatment will be necessary.

DISCUSSION

Pelvic organ prolapse rarely occurs in patients receiving PD. These 2 patients represent the only cases in over 200 incident ESRD patients receiving PD in one author's experience. Both patients had well-known risk factors for pelvic organ prolapse including female gender, advanced age, multiparity, post menopausal status, and vaginal method of obstetric delivery (1). These 2 patients illustrate an additional unreported risk factor. Peritoneal dialysis requires the presence of 2 to 3 L of dialysis fluid in the peritoneal space. Intra-abdominal pressure increases with the presence of dialysis fluid itself, and is exacerbated by an upright position (sitting > standing) or valsalva maneuver (2). We believe the additional 2 – 3 L of fluid in the peritoneal cavity and its accompanying pressure in the rectovaginal space triggered symptomatic pelvic organ prolapse in these patients. Since ESRD patients make little or no urine, patients rarely complain of cystocele or urinary incontinence.

Dialysis patients also suffer from constipation, a result of fluid restriction, phosphate binder usage, and poor dietary fiber intake. Constipation appears to be as important as obstetric trauma in the development of pelvic floor damage (1,3). Treating constipation might significantly reduce the prevalence of pelvic floor damage.

The 2 patients described highlight the most common risk factors for prolapse including postmenopausal status, multiparity, vaginal delivery, and obesity. In addition, the patient in Case 1 had elevated intra-peritoneal pressure from massive polycystic kidneys measuring 16.4 cm on the right and 17.1 cm on the left, as well as a large cystic liver.

All patients with organ prolapse are instructed on conservative measures to minimize intra-abdominal pressures and to slow or limit the progression of their disease. Measures include medical and dietary correction of constipation, medical management of chronic cough, weight reduction, limits on lifting and performing high-impact exercise, and initiation of pelvic floor exercises (i.e. Kegel). In addition, postmenopausal patients with organ prolapse can initiate vaginal estrogen therapy to help maintain tissue integrity. In our patients, modifications to their PD regimens appeared to have a significant beneficial effect.

Surgical correction for pelvic organ prolapse has evolved over several decades. Currently, the gold standard for surgical correction is the abdominal sacrocolpopexy, which is routinely performed laparoscopically or with robotic assistance. More information on abdominal sacrocolpopexy can be found in a comprehensive review by Nygaard *et al.* (4) Unfortunately, this intraperitoneal approach to repair is suboptimal for PD patients because

it both introduces the risk of PD fluid infection, and opens the retroperitoneal space, which could lead to significant retroperitoneal fluid dissection. Furthermore, the presence of PD fluid may inhibit postoperative re-peritonealization and increase the theoretical risk of a postoperative bowel obstruction.

All rectocele repairs aim to repair or replace the connective tissue separating the rectum from the vagina. Retroperitoneal vaginal approaches to repair include site-specific posterior colporrhaphy, where the defective rectovaginal fascia is primarily repaired, and posterior graft placement with either a synthetic or biologic material. Either approach can be combined with apical vault attachments to the sacrospinous ligaments if apical (uterine) prolapse is also significant.

Unfortunately, these vaginal retroperitoneal approaches to rectocele repair do not allow for obliteration of the posterior cul-de-sac, leaving the deep rectovaginal fluid dissection plane unaddressed. It is our fear that the peritoneocele dissecting into the rectovaginal space with valsalva and defecation will persist in CAPD patients, leaving them with persistent incomplete defecation issues.

CONCLUSION

Conservative monitoring, medical, and surgical management represent the treatment options for vaginal prolapse (1).

With regard to PD options, APD may be offered to the patient. Automated peritoneal dialysis, performed in the supine position, decreases intra-abdominal pressure compared to CAPD (5). Often, minimal to no PD fluid remains in the abdomen during the daytime when the patient is in the erect position. In our limited experience, changing from CAPD to APD, in addition to conservative non-surgical approaches to prolapse, was sufficient to mitigate the patients' symptoms, continue renal replacement with PD, and improve their quality of life.

When combined surgical management becomes imperative to address a significant refractory apical and posterior compartment prolapse, we advocate a vaginal retroperitoneal approach to repair in this unique patient population.

DISCLOSURES

The authors have no financial conflicts of interest to declare.

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