Repair of Vagino-Peritoneal Fistula Caused by Vaginal Cuff Fixation of Peritoneal Dialysis Catheter: A Case Report

KEY WORDS: Peritoneal dialysis catheter; catheter tip migration; intra-abdominal catheter fixation; complication.

Peritoneal dialysis (PD) catheter tip migration is a source of morbidity for patients on PD (1,2). In the setting of end-stage renal disease requiring dialysis, intra-abdominal fixation of the catheter tip to pelvic structures has been advocated as a possible way to reduce rates of catheter failure (3–12).

We present a case and unique treatment of a woman post-remote hysterectomy who developed a vagino-peritoneal (VP) fistula following placement of a PD catheter which had been sutured to the vaginal cuff.

CASE REPORT

A 43-year-old woman with end-stage renal disease secondary to hypertension and type II diabetes mellitus had a PD catheter placed in May 2013 at an outside hospital. Her past medical history also included stroke, coronary artery disease, atrial fibrillation, and ongoing tobacco use. Her previous surgical history included a hysterectomy for pelvic inflammatory disease over 10 years prior.

In June 2013, the patient was admitted to our institution for hypertensive urgency and pulmonary edema. During the course of her admission, her PD catheter was flushed, which resulted in increased abdominal pain and watery vaginal discharge. A negative computerized tomography (CT) scan prompted a fluoroscopic study of the PD catheter, which showed extravasation of contrast through the vagina, confirming the formation of a VP fistula (Figure 1).

The urogynecology and minimally invasive surgery (MIS) services took the patient to the operating room for fistula repair and PD catheter removal. Blue dye was infused through the PD catheter, allowing for optimal visualization of the fistula, which was identified at the vaginal apex to the left of the midline. While the MIS team disconnected the PD catheter from the abdominal wall, the vaginal mucosa was denuded circumferentially around the fistula tract to prepare for vaginal fistula repair (13). Extensive laparoscopic adhesiolysis eventually demonstrated silk suture securing the PD catheter to the vaginal cuff. Following the removal of the catheter, the vaginal endopelvic fascia was closed in 2 layers

Figure 1 — Fluoroscopy showing vagino-peritoneal fistula.

of interrupted, sagittally-placed sutures without overlap, and the mucosa was closed without vaginal stricture, using a Latzko technique (13).

The patient's post-operative course was prolonged due to her multiple medical comorbidities as well as a positive *Pseudomonas* culture from the catheter. Two months post-operative, she had no symptoms that suggested persistence or recurrence of the VP fistula.

DISCUSSION

Intra-abdominal fixation of the catheter tip is an appropriate technique to reduce catheter failure in some patients, and the fundus of the uterus has been identified as a potential catheter anchor site. We could find no report of the vaginal cuff being used for this purpose in post-hysterectomy patients. We would recommend caution with regard to intra-abdominal fixation in patients with surgically-altered anatomy.

Several processes contributed to the complication this patient experienced. Extensive adhesions and surgically-altered anatomy represent intraoperative risk factors for injury to pelvic structures and could obscure landmarks important for correct surgical orientation. The surgeon who placed the PD catheter possibly did not recognize the structure to which the catheter tip was being sutured and the use of a non-absorbable suture likely created a tract between the peritoneum and the vaginal canal. Chronic, repeated movement of the PD catheter likely resulted in intermittent tension on the vaginal cuff, causing persistent tissue injury with erosion and expansion of the suture tract. Finally, cultures from the PD catheter grew *Pseudomonas*, a biofilm-forming organism. A biofilm may have been present within the suture tract, causing a localized inflammatory reaction. Neutrophil

degranulation would introduce proteolytic enzymes around the suture tract, degrading the integrity of the tissue. Finally, diabetes and tobacco use are well-recognized risk factors for impaired wound healing, providing further risk for fistula tract formation.

The Latzko technique utilized here in the repair of a VP fistula was originally described for repair of a vesicovaginal fistula, in which a denuded portion of the vaginal wall is coapted around the fistula tract with excellent results (13,14). This case highlights the importance of careful fixation of PD catheters and the benefit of a multi-disciplinary team to enhance problem-solving in unique clinical scenarios.

DISCLOSURES

The authors have no financial conflicts of interest to declare.

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REFERENCES

1. Taal MW, Brenner BM, Rector FC. *Brenner & Rector's the Kidney*. 9th ed. Philadelphia: Elsevier/Saunders, 2012.
2. Tokgoz B. Clinical advantages of peritoneal dialysis. *Perit Dial Int* 2009; 29(2):59–61.
3. Lu C, Watson D, Elias T, Faull R, Clarkson A, Bannister K. Laparoscopic placement of peritoneal dialysis catheters: 7 years experience. *ANZ J Surg* 2003; 73:109–11.
4. Ko J, Ra W, Bae T, Lee T, Kim H, Han H. Two-port laparoscopic placement of a peritoneal dialysis catheter with abdominal wall fixation. *Surg Today* 2009; 39(4):356–8.
5. Bar-Zohar D, Sagie B, Lubezky N, Blum M, Klausner J, Abu-Abeid S. Laparoscopic implantation of the Tenckhoff catheter for the treatment of end-stage renal failure and congestive heart failure: experience with the pelvic fixation technique. *Isr Med Assoc J* 2006; 8(3):174–8.
6. Gunes ME, Uzum G, Koc O, Duzkoğlu Y, Kucukylmaz M, Sari YS, et al. A modified method in laparoscopic peritoneal catheter implantation: the combination of preperitoneal tunneling and pelvic fixation. *ISRN Surg* 2013; 15:2013:248126.
7. Watson D, Paterson D, Bannister K. Secure placement of peritoneal dialysis catheters using a laparoscopic technique. *Surg Laparosc Endosc* 1996; 6(1):35–7.
8. Kume H, Miyazaki H, Nagata M, Ishikawa A, Ishibashi Y, Fujita T, et al. Peritoneal fixation prevents dislocation of Tenckhoff catheter. *Perit Dial Int* 2011; 31(6):694–7.
9. Bae E, Chung W, Choi S, Kang J. Laparoscopic internal fixation is a viable alternative option for continuous ambulatory peritoneal dialysis catheter insertion. *J Korean Surg Soc* 2012; 83(6):381–7.
10. Yilmazlar T, Kirdak T, Bilgin S, Yavuz M, Yurtkuran M. Laparoscopic findings of peritoneal dialysis catheter malfunction and management outcomes. *Perit Dial Int* 2006; 26:374–9.

11. Ogunc G. Malfunctioning peritoneal dialysis catheter and accompanying surgical pathology repaired by laparoscopic surgery. *Perit Dial Int* 2002; 22:454–62.
12. Julian T, Ribeiro U, Bruns F, Fraley D. Malfunctioning peritoneal dialysis catheter repaired by laparoscopic surgery. *Perit Dial Int* 1995; 15(8):363–6.
13. Latzko W. Postoperative vesicovaginal fistulas: genesis and therapy. *Am J Surg* 1942; 58(2):211–28.
14. Ansquer Y, Mellier G, Santulli P, Bennis M, Mandelbrot L, Madelenat P, et al. Latzko operation for vault vesicovaginal fistula. *Acta Obstet Gynecol Scand* 2006; 85:1248–51.

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