American Journal of Case Reports

e-ISSN 1941-5923
© Am J Case Rep, 2020; 21: e922828
DOI: 10.12659/AJCR.922828

Received: 2020.01.13
Accepted: 2020.04.28
Available online: 2020.06.03
Published: 2020.07.16

A Rare Complication of Peritoneal Dialysis (PD) Catheter: Perforation of Sigmoid Colon by Migrating Tip of Peritoneal Dialysis Catheter

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

BCEF 1 Sabahat Afshan
BCEF 2 Truman M. Earl
BCEF 2 Christopher D. Anderson
BCEF 1 Mehul Dixit

1 Department of Pediatrics, Division of Pediatric Nephrology, University of Mississippi Medical Center, Jackson, MS, U.S.A.
2 Department of Surgery, Division of Transplant Surgery, University of Mississippi Medical Center, Jackson, MS, U.S.A.

Corresponding Author: Sabahat Afshan, e-mail: safshan@umc.edu
Conflict of interest: None declared
Source of support: This work was supported by 2005-086 Bower Foundation Grant

Patient: Male, 12-year-old
Final Diagnosis: Colonic perforation
Symptoms: Rectal prolapse
Medication: —
Clinical Procedure: Surgery removal
Specialty: Nephrology

Objective: Unusual clinical course

Background: Peritoneal dialysis (PD) has benefits over hemodialysis (HD), including the ability of daily performance at home without interfering with important activities such as school attendance in children. However, there are risks and complications associated with it. This is the third pediatric case report of a dormant PD catheter tip perforating the colon and protruding through the anus, but without peritonitis, as would be highly expected.

Case Report: A 12-year-old male with ESRD secondary to obstructive uropathy received a pre-emptive deceased donor kidney transplant that failed within a few days due to thrombosis secondary to factor V Leiden deficiency. Transplant nephrectomy was performed and several months later he was started on PD. Subsequently, due to multiple episodes of catheter drain failure, the modality was switched to HD with a plan to remove the PD catheter later. Two months after discontinuing PD, he presented to the Emergency Department with the catheter tip protruding through the anus and he was asymptomatic. Abdominal X-ray (AXR) and CT scans were performed. The PD catheter was removed and the colon was repaired by proctosigmoidoscopy and laparotomy. Five years later, he continues to be on HD by preference, with arteriovenous fistula (AVF), without any complications of perforation.

Conclusions: There are 2 cases previously reported in children with colonic perforation by the tip of a PD catheter without signs and symptoms of peritonitis, but those patients were on immunosuppression after kidney transplant. Our patient is unique because he was not on immunosuppression.

MeSH Keywords: Colon, Sigmoid • Constipation • Intestinal Perforation • Peritoneal Dialysis

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/922828

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

Background

PD is the preferred method of renal replacement therapy in children with end-stage renal disease [1]. Intestinal perforation due to a PD catheter is a rare mechanical complication that usually presents with peritonitis and an acute surgical abdomen [2]; however, immunosuppression may mask the symptoms of peritonitis after visceral perforation [3]. We present a case of a non-functional peritoneal dialysis catheter with colon perforation presenting as a foreign body protruding through the anus, with no signs or symptoms of acute abdomen or peritonitis [4]. To the best of our knowledge, this is the third published pediatric case report with similar presentation; however, in the other 2 cases, the patients were on maintenance immunosuppression after kidney transplant.

Case Report

A 12-year-old white male who developed end-stage renal disease (ESRD) secondary to obstructive uropathy received a preemptive deceased donor kidney transplant at another institution that failed within a few days secondary to thrombosis. He was found to have a clot in the right iliac vein on day 3 after transplant. Later on, work-up was positive for factor V Leiden deficiency. He has been maintained on anti-coagulation therapy since that time. Transplant nephrectomy was performed and he remained stable without dialysis for 1 year. A 46-cm curled double-cuffed PD catheter was placed laparoscopically 13 months after transplant nephrectomy, without any complications. On laparoscopic visualization, no major abnormalities were seen, but he had several adhesions from the previous kidney transplant and transplant nephrectomy. PD was initiated successfully, but the patient subsequently had repeated episodes of PD catheter outflow obstruction. He did not have inflammatory bowel disease clinically or on imaging such as CT scan, amyloidosis was not a concern as he was on dialysis only for a few months, and he did not have a history of Deflux procedure. He had severe constipation that was treated with different medicines, including polyethylene glycol, lactulose, and bisacodyl, and it was thought to have been contributing to the catheter dysfunction. At 16 weeks after initiation of PD, he underwent laparoscopic repositioning of the catheter because the tip had migrated from the pelvis to a higher position in the peritoneal cavity. The catheter tip was placed back in the right side of the pelvis, and adhesions seen during the procedure were removed. However, the PD catheter continued to have outflow obstruction and a tunneled hemodialysis catheter was placed by interventional radiology 1 week after the repositioning of the catheter, with a plan to create an AV fistula and remove the PD catheter at the same time by transplant surgery once he was stable on HD.

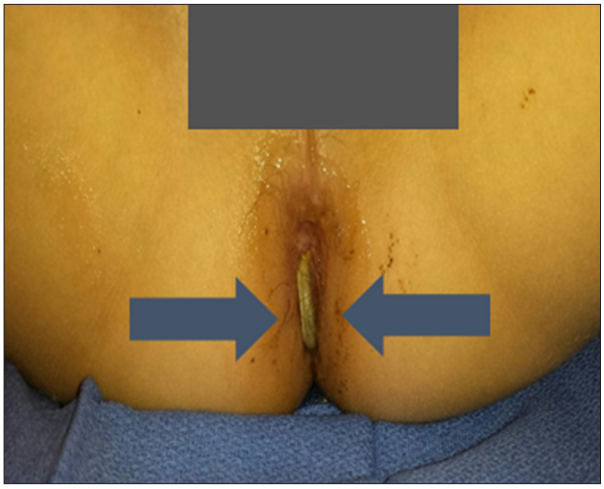

Figure 1. PD catheter protruding through anus on exam (arrows).

Two months after discontinuing PD, the patient presented to the Emergency Department with a foreign body protruding through the anus (Figure 1) that he noticed during a bowel movement. He did not have any fever or abdominal or perineal pain, and he did not have any blood in the stool. AXR and CT scan were performed (Figures 2–4) and he was taken to an operating room (OR).

He underwent a rigid proctosigmoidoscopy and exploratory laparotomy with removal of the PD catheter and repair of the colon. On rigid proctosigmoidoscopy, the PD catheter was in the colon and rectum 15 cm from the anus, indicating the PD catheter had entered the colon within the peritoneal cavity. A long tract surrounded by omentum traversing from the left mid-abdomen to the right lower quadrant was found. The PD catheter was found entering the sigmoid colon. The sigmoid colon was repaired primarily after the PD catheter was removed. The patient recovered well postoperatively, without peritonitis, and continued on scheduled hemodialysis.

Discussion

Bowel erosion by a dormant or a functioning peritoneal dialysis (PD) catheter late after insertion has been reported in the literature [5–7]. However, this is the first pediatric case reported with asymptomatic perforation of the sigmoid colon by the tip of a PD catheter in an immunocompetent patient. The other 2 cases had similar presentation, with asymptomatic perforation of colon by a dormant catheter and catheter tip protruding through the anus, but they were maintained on immunosuppression after kidney transplant [8,9]. Immunosuppression, particularly steroids, can mask the signs and symptoms of peritonitis following visceral perforation [3]. Our patient was not on immunosuppression as he had transplant nephrectomy after failure of the allograft, but he was still asymptomatic.

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

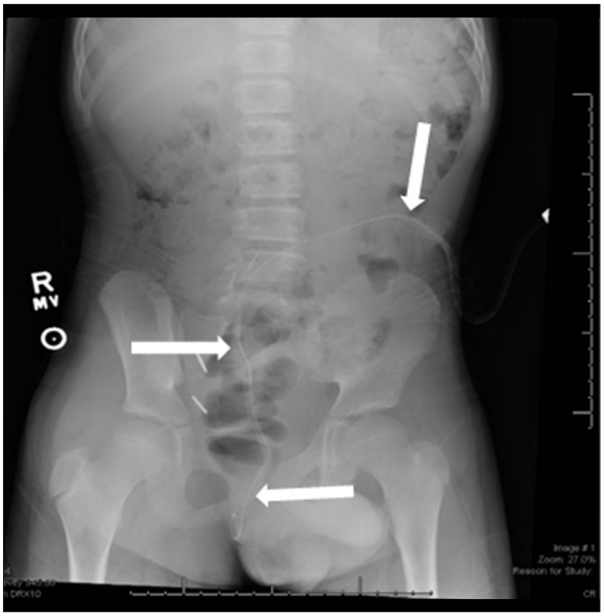

Figure 2. Abdominal X-ray anteroposterior view showing PD catheter with the tip projecting over the perineum (arrows).

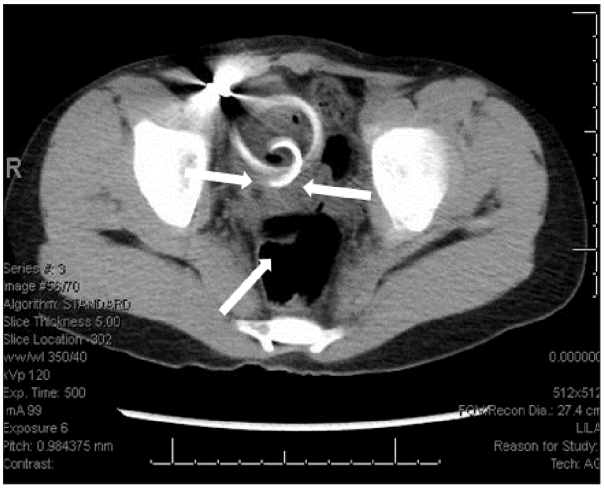

Figure 3. Abdominal CT scan transverse view showing the entry of PD catheter in sigmoid colon (arrows).

Perforation of the viscera by a PD catheter tip is a complication of PD that is rare but could be life-threatening and is an acute emergency [2]. Our patient was on HD due to outflow

Obstruction of a PD catheter that was dormant for 2 months. A tunneled HD catheter was placed by interventional radiology. The ultimate dialysis access plan was to create an AVF and pull the PD catheter the same day by transplant surgery to limit the number of visits to the OR because surgical procedures required holding the warfarin that he was taking for factor V Leiden deficiency. While he was waiting for the procedure, the PD catheter tip slowly perforated the large intestine and entered the

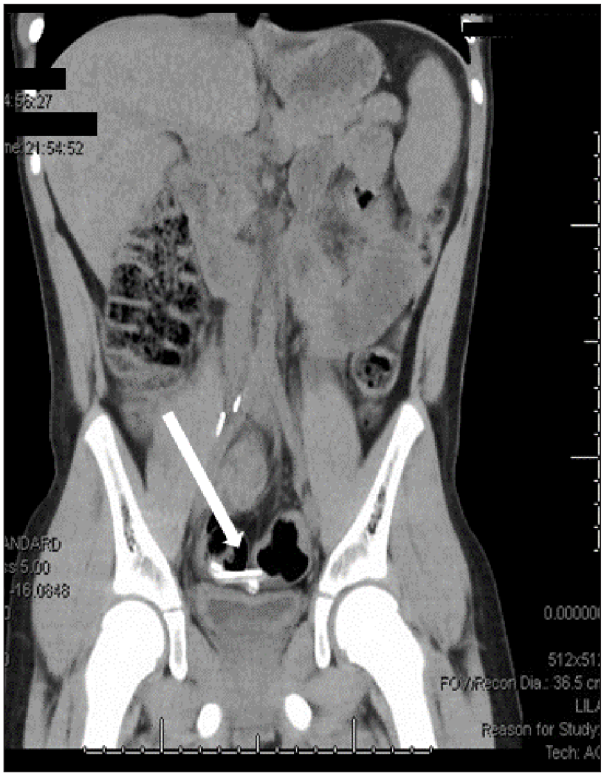

Figure 4. Abdominal CT scan coronal view showing the entry of PD catheter in sigmoid colon (arrows).

rectum. Because the catheter was not in use, migration of the tip remained undetected as it penetrated the viscera, probably slowly, as it did not cause any intra-abdominal or rectal bleeding. The patient had a history of constipation and on the day of presentation, straining during a bowel movement may have pushed the catheter tip through the anus. Brady et al. [2] reported 2 patients with colonic erosions by dormant PD catheters after renal transplantation and speculated that dormant catheters are more likely to erode the bowel because of persistent unlubricated or unbuffered contact between the bowel and the catheter. However, this remains unclear.

Mechanical complications are an important cause of PD failure [10,11]. In addition to the type and size of catheter used, constipation is a significant factor that can contribute to mechanical complications [10,11]. Fecal impaction and bowel distention can cause migration of the catheter tip and obstruct the catheter flow by occluding the catheter side holes. The importance of constipation treatment should not be underestimated in patients on PD [10,11]. Prevention of constipation can decrease the incidence of mechanical complications like migration of the catheter tip. In this case, the patient did not develop peritonitis, likely due to chronic slow erosion of the bowel wall and simultaneous entrapment of the PD catheter by the omentum that walled off the eroded area from the rest of the peritoneal cavity, preventing the spread of inflammation.

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

Conclusions

This is third pediatric case report of the tip of a PD catheter perforating the colon and extruding through the anus without any signs or symptoms of peritonitis. Our case is unique in that the patient was off immunosuppressive therapy at the time of perforation, unlike the other 2 cases, and if he had developed even a mild case of peritonitis, he would have had significant symptoms.

Additionally, we followed him for 5 years without any obstruction from adhesions.

Acknowledgements

We would like to thank Dr. Atul Poudel for his contributions.

Conflicts of interest

None.

References:

1. Tsai HL, Yang LY, Chin TW et al: Outcome and risk factors or mortality in pediatric peritoneal dialysis. Perit Dial Int, 2010; 30(2): 233–39
2. Brady HR, Abraham G, Oreopoulos DG, Cardella CJ: Bowel erosion due to a dormant peritoneal catheter in immunosuppressed renal transplant recipients. Perit Dial Int, 1998; 8: 163–65
3. Tantisattamo E, Guasch A: Atypical presentation of perforated sigmoid diverticulitis in a kidney transplant recipient with autosomal dominant polycystic kidney disease. Hawaii J Med Public Health, 2013; 72(7): 216–18
4. Poudel A, Afshan S, Earl T, Anderson CD, Dixit M: An unusual complication of peritoneal dialysis catheter. Poster presented at: Annual Dialysis Conference. Feb 2015; New Orleans LA *https://doi.org/10.1177%2F08968608150350 1S12*
5. Kachoie A, Safari S, Hosseinzadeh F, Vafaeimanesh J: Supportive treatment of delayed perforated colon due to peritoneal dialysis catheterization. Capsian J Intern Med, 2014; 5(3): 176–78
6. Wang R, Chen Z, Wang J et al: Delayed bowel perforation in a peritoneal dialysis patient: a case report and literature review. Perit Dial Int, 2014; 34(4): 460–66
7. Ramanarayanan S, Gupta S, Vuthaluru S, Gamanagatti S: Small-bowel erosion by a functioning peritoneal dialysis catheter. Perit Dial Int, 2014; 34(1): 124–27
8. Saweirs WW, Casey J: Asymptomatic bowel perforation by a Tenckhoff catheter. Perit Dial Int, 2005; 25(2): 195–96
9. Maxted AP, Davies B, Colliver D et al: Peritoneal dialysis catheter removal post-transplant – a rare case of delayed bowel perforation. Perit Dial Int, 2017; 37(6): 650–51
10. McCormick BB, Bargman JM: Noninfectious complications of peritoneal dialysis: Implications for patient and technique survival. J Am Soc Nephrol, 2007: 18(12): 3023–25
11. Lee A: Constipation in patients on peritoneal dialysis: A literature review. Ren Soc Aust J, 2011; 7(3): 122–29

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]