Bowel Migration of Dormant Chronic Ambulatory Peritoneal Dialysis Catheter: A Vexed Problem Not Avoided by Flushing

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Abstract

Delayed bowel erosion by peritoneal dialysis catheter is rare with fewer than thirty cases having been reported in the literature. This complication is usually encountered when the catheter is kept dormant. Two cases have also been reported with catheters in active use. The risk factors for bowel erosion include immunosuppression, diverticulosis, and amyloidosis. An 80-year-old male with chronic kidney disease Stage 5 due to hypertensive nephrosclerosis underwent chronic ambulatory peritoneal dialysis catheter insertion. Due to improvement in the glomerular filtration rate and clinical parameters including extracellular fluid volume status, peritoneal dialysis was not initiated. Weekly catheter flushes were performed. After 5 months, he developed watery diarrhea after a regular flushing episode. Computed tomography scan revealed the catheter displaced into the sigmoid colon with the tip in the rectum. He was managed successfully with catheter removal alone and conservative treatment. He remains asymptomatic at 3-month follow-up. This case is presented to emphasize the fact that delayed bowel erosion can happen with dormant catheter even in the absence of risk factors. Periodic flushing has not prevented this complication in our patient. Perforations can be self-curing when diagnosed early and when patients present without features of peritonitis or sepsis. Such cases can be managed successfully with catheter removal alone.

Keywords: *Bowel migration, catheter complications, chronic ambulatory peritoneal dialysis catheter, delayed bowel perforation*

Introduction

Dormancy of peritoneal dialysis catheter can lead to delayed bowel perforation with few cases being reported worldwide. This dreaded complication can be prevented to a great extent by regular flushing of the catheter. We report a case of delayed bowel erosion despite regular flushing and conservative management of the same with removal of the offending catheter alone.

Case Report

Our patient, an 80-year-old man, presented with progressively worsening renal failure in the setting of long-standing hypertension and workup consistent with chronic kidney disease (CKD). Ultrasonogram showed small echogenic kidneys bilaterally. He was not diabetic and did not have any prior history of bowel disease or surgery. His serum creatinine was 5.8 mg/dl consistent with an estimated glomerular filtration rate (eGFR) of 8 ml/min/1.73 m^2. He had features suggestive of significant extracellular fluid (ECF) volume excess.

Chronic ambulatory peritoneal dialysis (CAPD) was chosen as the renal replacement therapy (RRT) after modality education. A double-cuffed swan neck Tenckhoff straight tip catheter was inserted through subumbilical incision under local anesthesia.

In the postcatheter insertion period, a good improvement was documented in clinical parameters including ECF volume excess. There was a marginal improvement in eGFR to 11 ml/min/1.73 m^2. In discussion with the patient, it was decided not to initiate CAPD. Weekly flushing of the CAPD catheter was performed using 2 L of 1.5% dextrose solution with a dwell time of 2 h.

Over the span of the next 5 months, he remained well until he developed profuse watery diarrhea after a routine flushing of the CAPD catheter. This was not accompanied by any abdominal pain, vomiting, or fever. He had been completely asymptomatic in regards to bowel symptoms till the onset of diarrhea.

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A nonenhanced computed tomography (CT) scan of the abdomen was performed to confirm the position of the catheter, which was seen entering the sigmoid colon [Figure 1] with its tip in the rectum [Figure 2]. There was no evidence of diverticulosis on abdominal imaging. The peritoneal dialysis catheter was removed surgically. The catheter cuff was seen adhered to the peritoneum, and the catheter itself appeared normal on retrieval.

He was managed conservatively after catheter removal with intravenous fluids and antibiotics. Oral liquids were started on the 3rd postoperative day, which was tolerated well. The surgical drain volume was negligible, and the drain was removed on the 5th postoperative day. Normal bowel movements were attained, and he was discharged on the 7th postoperative day. At 3-month follow-up, the patient remains well with a stable GFR and off dialysis.

Discussion

Bowel injury and perforation during CAPD catheter insertion is a known complication with incidence rates of 1.3%–1.6%.[1] Delayed bowel erosion due to peritoneal dialysis catheter though uncommon has been well recognized. Less than 30 cases have been reported in the literature so far.[2] In dormant catheters, the absence of peritoneal fluid and a constant rubbing of the catheter tip against the bowel wall lead to pressure-induced necrosis.[1] Fluid in the peritoneal cavity bathes the bowel loops and acts as a natural barrier preventing adhesion of the catheter to the bowel wall.

Nearly all parts of the bowel – small bowel,[3] appendix, cecum, transverse colon,[4] sigmoid colon,[5] and rectum[6] – have been found to be involved in delayed bowel erosion. Presentations varied from watery diarrhea, decreased return of peritoneal dialysate, feculent dialysate effluent, rectal hemorrhage, peritonitis, and sepsis. In four cases, the catheter tip was seen protruding out of the anus on defecation. The diagnosis has been confirmed by CT, contrast fluoroscopy, colonoscopy, or exploratory laparotomy.

The risk factors for delayed bowel erosion are dormant peritoneal dialysis catheter, immunosuppression, and the presence of bowel diseases such as diverticulosis or amyloidosis.[7] The type of catheter tip (coiled vs. straight) does not seem to influence the likelihood of erosion.[2] The most common scenario where delayed bowel erosion was encountered was after renal transplantation when the peritoneal dialysis catheter was retained.[2] Immunosuppression further decreases the inflammatory response of bowel thereby favoring erosion. The period of dormancy before bowel erosion has varied from 6 weeks to as late as 4 years. Delayed bowel erosion, however, has been reported with functioning catheters as well.[3,8] Periodic catheter flushes have been advocated to prevent this complication although the ideal frequency of flushing has not been established.[9] Prior reports as well as the experience in our patient seem to suggest that catheter flushes alone may not completely eliminate the risk.[2]

The majority of cases were treated by laparotomy and catheter removal along with resection of the affected segment varying from segmental resection[4] to hemicolectomy.[8] An alternate approach has been laparotomy, catheter removal, and suturing of the bowel entry site.[9] Only a few cases have been managed with catheter removal and conservative management alone as in our patient.[2]

Initiation of RRT for Stage 5 CKD in the elderly needs careful consideration of several factors including the presence of comorbidities and frailty as well as patient preference in respect to dialysis modality and access creation. The option of continuing conservative care alone may be appropriate for many octogenarians and nonagenarians with expected poor outcomes on RRT. Home-based therapies, especially CAPD, remain a natural choice for many high-functioning elders like our patient

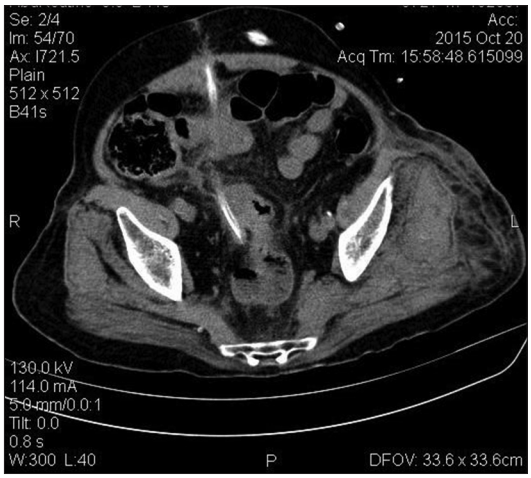

Figure 1: Chronic ambulatory peritoneal dialysis catheter seen entering the sigmoid colon

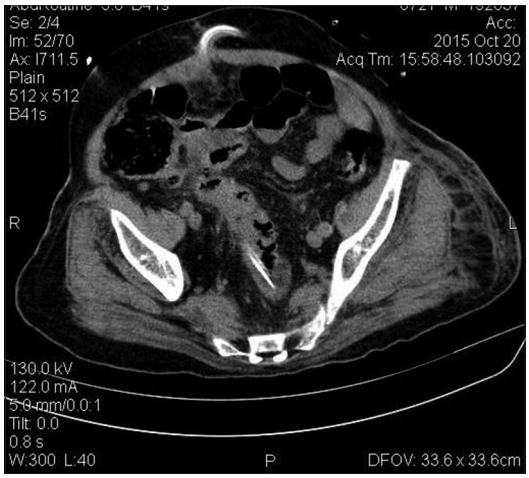

Figure 2: Chronic ambulatory peritoneal dialysis catheter tip seen inside the rectal lumen

who wish to remain independent of facility-based dialysis. The timing of access creation, however, proves to be an elusive art requiring a careful consideration of multiple factors including the partial reversal of precipitants that may have caused a transient decline in GFR.

Conclusion

This case is presented to highlight the following facts:

- Delayed bowel erosion can occur in the absence of suggested risk factors such as immunosuppression and bowel disease
- Regular catheter flushing does not seem to prevent this complication
- In the absence of sepsis or peritonitis, catheter removal alone combined with a period of conservative treatment and careful observation may be curative
- Appropriately timing of the creation of CAPD access remains critically important in view of complications such as bowel erosion that are associated with the premature placement and dormancy of catheters
- It would also be prudent to consider removal of the CAPD catheter if regular usage is not contemplated for some time.

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Conflicts of interest

There are no conflicts of interest.

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