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An Unusual Complication of a Peritoneal Dialysis Catheter

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Peritoneal dialysis catheters have undergone various modifications over time in an effort to reduce technique failure. Complications resulting from the catheter insertion technique can contribute significantly to technique failure. We report one such complication, highlighting the importance of careful surgical technique in ensuring proper catheter placement.

Key words
Missouri swan-neck catheter, cathetergram, ultrafiltration failure

Introduction

Peritoneal catheters should be implanted by an experienced surgeon or operator. Complications resulting from catheter insertion techniques can contribute significantly to technique failure (1). Blind insertion should be avoided, especially in obese patients and in patients with previous abdominal surgeries.

Catheter-related problems leading to transfer to hemodialysis (HD) occur in up to 20% of patients (2). One-year catheter survival of more than 80% and primary catheter failure of less than 10% are acceptable guidelines (2). Refinements in peritoneal dialysis (PD) catheter design and in surgical technique have reduced the noninfectious complications leading to technique failure (3,4). Outflow failure is one such noninfectious complication, and it is especially common in obese patients (5). Such patients pose a special challenge in catheter insertion and are associated with a higher risk of complications (5). Early diagnostic imaging is warranted in such cases to diagnose the problem quickly.

Careful surgical technique becomes all the more important if an obese patient desires an abdominal exit site instead of a presternal placement owing to lax abdominal tissue. Here, we report a case of an unusually malpositioned catheter that resulted in outflow failure after 1 year on PD.

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Case Report

A 52-year-old white woman with end-stage renal disease secondary to type 2 diabetes mellitus and hypertension, on PD for 15 months, was admitted with weight gain and outflow problems. An abdominal peritoneal catheter had been placed in September 2006. Continuous ambulatory PD (CAPD) was successfully initiated 2 months later. Soon after, she encountered intermittent outflow problems that led to a trial of continuous cycling PD (CCPD). Owing to the need for a supine posture, CCPD resulted in a worsening of the outflow problems. The patient subsequently had to be switched back to CAPD.

On further inquiry, it was revealed that only 200 mL of dialysis fluid could be returned after a 2-L infusion. Clinical examination revealed a 14 kg weight gain over a period of 2 months, with a total weight gain of 24 kg over a period of 2 years from the initiation of PD. The patient's initial body mass index of 53.9 kg/m^2 had increased to 57.4 kg/m^2 on presentation. No subcutaneous edema over the abdominal wall could be discerned. No other relevant finding besides lower extremity edema were observed on physical examination.

Three months before presentation, the patient's peritoneal membrane and adequacy data included a dialysate-to-plasma creatinine of 0.77, a glomerular filtration rate of 10.7 mL/min, and a total Kt/V of 2.78 (renal: 1.99; peritoneal: 0.79). The corresponding total Kt/V value 6 months before presentation was 2.43 (renal: 1.64; peritoneal: 0.79).

A plain abdominal anterior–posterior radiograph ruled out catheter kinking and luminal obstruction as possible causes of outflow failure (Figure 1). A computed tomography cathetergram was then performed (Figures 2 and 3). The cathetergram revealed that the intra-abdominal catheter tip had migrated into the subcutaneous tissue. A surgical consultation was obtained for replacement of the catheter. The operating surgeon reported that, during the procedure to remove the old catheter, the portion of the catheter that had migrated and subsequently embedded into the subcutaneous tissue had broken away from the remaining portion of the catheter. Owing to patient's large

habitus and pannus, it was decided not to remove the embedded segment by blunt dissection for fear of causing tissue trauma and poor wound healing. A new PD catheter was subsequently implanted at a different abdominal site. The segment of the old catheter that had broken away was left *in situ* in the subcutaneous tissue (Figure 4). The patient successfully resumed PD soon thereafter.

Discussion

Outflow failure is a significant PD catheter malfunction. In the case reported here, migration of the PD catheter from the pelvis into the subcutaneous tissue of the abdominal wall resulted in an unusual complication. After initially successful function, the migration of the intra-abdominal tip of the catheter into the subcutaneous tissue resulted in outflow failure

FIGURE 1 Anterior–posterior radiograph of abdomen, showing catheter tip in the pelvis (arrow).

FIGURE 3 Computed tomography image of abdomen, showing dye in the subcutaneous tissue (arrow).

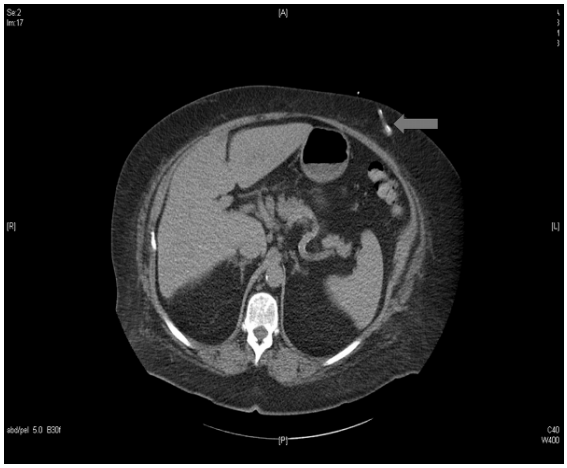

FIGURE 2 Computed tomography image of abdomen, showing catheter location (arrow).

FIGURE 4 New intraperitoneal peritoneal dialysis catheter (left arrow); abdominal hernia mesh (middle arrow); and broken subcutaneous segment of the old catheter (right arrow).

and weight gain. This problem is more likely to occur with straight PD catheters with a single cuff (6). In obese patients, the adipose tissue may act as a wedge to loosen the entry site of the abdominal segment, resulting in migration and malfunction. Poorer outcome of PD catheters in obese patients has previously been reported (5). In general, as compared with abdominal catheters, presternal catheters have fewer infectious complications and an overall lower complication rate (4,7). Caution should be exercised during the surgical technique when deciding whether to remove a broken segment, because removal may cause unnecessary tissue trauma and delay wound healing.

Summary

The case reported here highlights the unusual migration of a catheter tip into the abdominal wall in an obese patient, resulting in unexplained outflow problems.

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