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## Case Report

# Uncommon Cause of Acute Abdominal Pain in an Elderly Patient Undergoing Peritoneal Dialysis

Chi-Feng Huang<sup>a</sup>, Chi-Feng Pan<sup>a,b,c\*</sup>

<sup>a</sup> Division of Nephrology, Department of Internal Medicine, Mackay Memorial Hospital, Taipei, Taiwan, <sup>b</sup> Mackay Junior College of Medicine, Nursing, and Management, Taipei, Taiwan, <sup>c</sup> Department of Medicine, Mackay Medical College, New Taipei City, Taiwan.

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## SUMMARY

A 65-year-old male patient who had been undergoing peritoneal dialysis (PD) for end-stage renal disease (ESRD) for 5 years visited the emergency department because of acute abdominal pain and distension during PD. On examination, dialysate flow dysfunction was observed. After blood tests and peritoneal dialysate fluid analysis, PD-related peritonitis was excluded. When the PD catheter was “milked,” a fibrin clot was extracted. The abdominal pain and distension were relieved. He self-administered tranexamic acid on the presumption that he had hematuria. In clinical practice, when gastrointestinal, genitourinary, or gynecological bleeding occurs in ESRD patients, the bleeding is usually treated with tranexamic acid. We share our experience to increase the awareness of the possibility of increased fibrin thrombus formation in the PD catheter due to tranexamic acid administration in PD patients.

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## 1. Introduction

Peritoneal dialysis (PD) is an effective therapy for patients with end-stage renal disease (ESRD). In PD patients, acute abdominal pain is one of the main symptoms of PD-related peritonitis, which is a serious complication. It can also be due to non-infection-related complications such as PD catheter dysfunction. We report an uncommon cause of acute abdominal pain and abdominal distension in a patient undergoing PD.

## 2. Case report

A 65-year-old male patient had been undergoing PD for ESRD for 5 years. He had one episode of PD-associated peritonitis in March 2013, which resolved after 3 weeks of antibiotic therapy. He visited the emergency department (ED) on October 2015 because of abdominal pain and abdominal distension during PD. Dialysis outflow dysfunction was diagnosed. At the ED, gross abdominal distension and generalized abdominal tenderness were observed. No intestinal herniation, catheter cuff extrusion, discharge from the PD catheter site, and abdominal wall edema were found. He had no fever, and his sinus tachycardia was within the normal range. The laboratory data were as follows: serum white blood cell (WBC) count,  $8.7 \times 10^3/\text{dl}$ ; hemoglobin level, 9.2 g/dL; platelet count,  $95 \times 10^3/\mu\text{L}$ ; blood urea nitrogen level, 67 mg/dL; creatinine level, 16.5 mg/dL; potassium level, 3.7 mEq/L; activated partial thromboplastin time, 31.4 s; prothrombin time, 9.9 s; and international normalized ratio, 0.95. The

kidney ureter bladder (KUB) shown in Fig. 1 shows no PD catheter migration.

PD catheter emptying revealed a fibrin clot in the syringe while the plunger was withdrawn. Dialysate fluid flowed out smoothly after the fibrin clot was removed. The total drainage volume was of 7.55 L, and the patient's abdominal pain and distension were greatly relieved. After blood tests and a peritoneal dialysate fluid analysis, including a dialysate analysis that revealed a pale-yellow clear appearance and a microscopic analysis that revealed a red blood cell count of 3 cells/mm<sup>3</sup> and WBC count of 8 cells/mm<sup>3</sup>, PD-related peritonitis was excluded.

When the patient was interviewed, he reported that he took tranexamic acid because he presented with bloody urine, which he



Fig. 1. Kidney ureter bladder film of the patient.

\* Corresponding author.

E-mail address: [pan530319@yahoo.com.tw](mailto:pan530319@yahoo.com.tw) (C.-F. Pan)

assumed to be a symptom of hematuria. This drug had been previously prescribed by his urologist when he had hematuria. After taking tranexamic acid, he experienced abdominal distension and severe abdominal pain. Hence, he visited the ED immediately.

### 3. Discussion

PD is one of the treatments for ESRD. PD-associated complications can be divided into two types: infection- and non-infection-related complications. The most frequent and important complication of PD is infection, which may result in catheter loss and discontinuation of PD.<sup>1</sup> Peritoneal catheter malfunction is a common form of non-infectious PD complication.

Outflow failure generally occurs within the first month of catheter use, with the onset time depending on the cause.<sup>2,3</sup> The incidence of outflow failure ranges from 6% to 55%.<sup>4</sup> Catheter malfunction causes are (1) intraluminal obstruction from fibrin strands, blood clots, or fungal balls; (2) extraluminal obstruction from the omental wrapping, adhesions, or compartmentalization and catheter kinking; and (3) catheter migration with or without malfunction.<sup>2,5</sup> After catheter malfunction is recognized and its cause is well defined, a management plan should be applied individually.

Intraluminal obstruction due to fibrin strands and blood clots should be treated with manual compression of the dialysis solution container or simple aspiration and/or flushing with a heparinized solution. If ineffective, urokinase or streptokinase irrigation should be applied. Other methods of management include wire manipulation, peritoneoscopic manipulation, and laparotomy with or without omentectomy or enterolysis.<sup>4</sup> Our patient had abdominal pain after dialysate outflow dysfunction. KUB revealed no catheter migration and constipation. An energetic suction aspirated a long fibrin clot; thereafter, the abdominal pain and distension improved. After taking a detailed history of the patient, we found that the patient took tranexamic acid before the present incident.

Tranexamic acid is a potent antifibrinolytic agent, which is used to improve bleeding status.<sup>4,6</sup> In the setting of renal impairment, tranexamic acid improves platelet function and shortens the bleeding time.<sup>7</sup> It has also proved beneficial as an adjunctive therapy for major upper gastrointestinal bleeding, including that occurring in dialysis patients.<sup>8</sup> Tranexamic acid was effective in controlling chronic bleeding from colonic angiodysplasias, spontaneous subdural, and cerebral hematoma in dialysis patients.<sup>8</sup>

In a PD patient, tranexamic acid was used to increase peritoneal membrane permeability.<sup>9</sup> It improved ultrafiltration (UF) in the case of UF failure, which is the main problem in PD patients with fluid overload.

A previous report described fibrin strands, as in Fig. 2, that were observed in dialysate fluid after tranexamic acid administration.<sup>9</sup> However, no study has reported regarding the relationship between tranexamic acid dosage and fibrin clot formation. From our clinical experience, artificial kidneys may present some blood clots in most patients taking tranexamic acid to improve bleeding status. Hemodialysis patients have less problems than PD patients after taking tranexamic acid. No absolute contraindication exists for tranexamic acid intake in ESRD patients, but the dosage should be reduced. The absolute contraindication of tranexamic acid intake is related to a hypersensitive reaction in the patient. The concurrent use of estrogen or an anti-inhibitor coagulant complex presents a high risk of fibrin clot formation. We share our experience to raise the awareness of the possibility of increased fibrin thrombus formation in the



Fig. 2. Fibrin plug in the PD effluent.

PD catheter due to tranexamic acid. When a fibrin plug is found in the PD effluent, a PD nurse, specialist, or colleague should perform a thorough patient history taking, including intake of tranexamic acid.

In conclusion, although tranexamic acid can be used safely in patients with ESRD to treat hematuria or bleeding status, clinicians must be aware of the adverse effects of tranexamic acid, such as enhancement of fibrin formation in the effluent dialysate. No information has been reported regarding the relationship between tranexamic acid dosage and fibrin plug formation. No serious side effect was observed in our patient, but morbidity increased. Tranexamic acid is a commonly used medication to stop the bleeding in patients with ESRD. Therefore, we report the present case to remind our colleagues, PD nurses, and patients to take precaution when using tranexamic acid in the context of possible fibrin strand formation and outflow obstruction.

### Conflicts of interest

There are no conflict of interests.

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