

Hemoperitoneum in a Peritoneal Dialysis Patient from a Retroperitoneal Source

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Hemoperitoneum in peritoneal dialysis patients is a known but infrequent complication. Hemoperitoneum is more frequent in women because of its association with a variety of gynecologic presentations such as reflux menstruation, ovulation, endometrial tissue implants within the peritoneal cavity (endometriosis), and bleeding follicular cysts. Other intraperitoneal causes of hemoperitoneum include minor catheter or abdominal trauma, vascular anomalies, or hepatic or splenic cysts.

Less frequently encountered is a presentation of hemoperitoneum from a retroperitoneal source. These presentations result either from peritoneal inflammation and subsequent peritoneal bleeding or retroperitoneal cavity pathology rupturing into the peritoneal cavity.

Here, we present the case of a peritoneal dialysis patient presenting with hemoperitoneum several days after undergoing cardiac catheterization. The catheterization was complicated by a large retroperitoneal hematoma. Details of the case are reported, and other retroperitoneal causes of hemoperitoneum are reviewed.

Key words

Hemoperitoneum, retroperitoneal

Introduction

Hemoperitoneum is an infrequent but well-described complication of peritoneal dialysis (PD) (1). Hemoperitoneum is more common in women because of the association with retroperitoneal menstruation, ovulation, follicular cyst rupture, and endometriosis (2). In

addition to those gynecologic causes of hemoperitoneum, a variety of other intraperitoneal lesions—such as minor PD catheter trauma, abdominal trauma, and hepatic or splenic cyst rupture—have been associated with peritoneal bleeding.

Most presentations of hemoperitoneum are benign and can be managed with conservative measures such as temporary discontinuation of anticoagulants or antiplatelet agents, and peritoneal irrigation with room-temperature dialysate (3). On rare occasions, hemoperitoneum can be life-threatening and can unmask severe bleeding sources such as arterial aneurysms or dissections requiring emergent surgical intervention (4,5).

Less familiar to PD clinicians is the presentation of hemoperitoneum not from a peritoneal source of bleeding, but from a retroperitoneal source. Here, we describe a patient who presented with bloody dialysate 2 days after a cardiac catheterization and stenting procedure. The patient was subsequently found to have a large retroperitoneal hematoma that presumably led to peritoneal membrane irritation and inflammation, with resultant intraperitoneal bleeding.

The present report describes this case in more detail and reviews the literature on retroperitoneal sources of hemoperitoneum. Clinicians encountering hemoperitoneum in PD patients should include retroperitoneal as well as intraperitoneal bleeding sources in the differential diagnosis.

Case description

The patient, a 68-year-old white man, had started PD 1 month before admission. He was being treated with automated PD (APD) using 10 L of 1.5% dextrose solution daily. Five days before admission, he developed chest pain, was diagnosed with a non-Q-wave myocardial infarction, and underwent cardiac catheterization via the right femoral artery, with angioplasty and

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attempt at stent placement. Two days after the cardiac catheterization, he developed right flank soreness and bright red effluent (Figure 1). He was re-admitted for further evaluation.

On examination, the patient was deemed to have stable vital signs with a blood pressure of 137/71 mmHg, a heart rate of 90, and a respiratory rate of 16. He was afebrile. No cardiac murmurs or rub were observed, and the lungs were clear. There was no evidence of a femoral artery hematoma or bruit at the cardiac catheterization site, and abdominal exam was benign and notable for no tenderness, no distention, and no guarding. Trace edema of the lower extremities was present. There was no obvious flank pain on palpation, and no Grey–Turner’s sign.

The patient’s medications included labetalol, long-acting nifedipine, a statin, oral vitamin D, insulin preparations, aspirin, and clopidogrel.

Laboratory examination of the effluent confirmed hemoperitoneum with 2100 red blood cells and 9 white blood cells per microliter. Hemoglobin was 12.2 g/L and remained stable during the admission. The patient’s PD prescription was continued, and the hemoperitoneum persisted.

Abdominal and pelvic computed tomography imaging revealed a 2 × 10-cm right retroperitoneal hemorrhage extending from the pelvis to the abdominal retroperitoneal space (Figure 2). No intra-abdominal or femoral or iliac artery pathology was noted.

Because of the stable physical exam, the patient’s PD therapy was continued, and the hemoperitoneum was observed to slowly resolve over the subsequent 7 days. Hemoglobin remained stable at 12.2 g/L. A right lower-extremity Doppler ultrasonography study was negative for superficial femoral artery pseudoaneurysm.

Discussion

The patient in this case was on APD therapy when he developed chest pain and underwent cardiac catheterization via the right femoral artery. Subsequent to the procedure and while being treated with antiplatelet agents, he developed a large right retroperitoneal hematoma. No direct communication between the retroperitoneal compartment and the peritoneal cavity could be determined, and no dialysate was believed to have crossed into the retroperitoneal space. This clinical presentation was believed to be explained by peritoneal membrane



FIGURE 1 Hemoperitoneum noted 3 days after cardiac catheterization.



FIGURE 2 Abdominal computed tomography imaging shows a large retroperitoneal hematoma.

irritation and bleeding because of the presence of the large retroperitoneal hematoma.

Hemoperitoneum attributable to a retroperitoneal hematoma has previously been described (6). In addition to retroperitoneal hematoma, other retroperitoneal sources of hemoperitoneum have been reported (Table I), including an iliopsoas hematoma, rupture of a retroperitoneal varix into the peritoneal cavity in cirrhotics (7–9), rupture of retroperitoneal lymph nodes because of metastasis or during chemotherapy, or rupture of an aortic aneurysm (10–12).

Of all causes of retroperitoneal bleeding that have resulted in hemoperitoneum, the most common have

TABLE 1 Retroperitoneal causes of hemoperitoneum

<i>Common causes</i>	<i>Rare causes</i>
Retroperitoneal hematoma	Femoral artery or vein manipulation
Autosomal dominant polycystic kidney disease	Retroperitoneal varix
Acquired renal cystic disease	Necrosis of retroperitoneal tumor or lymph nodes
Tuberous sclerosis	Iliopsoas hematoma
Lithotripsy	

been a result of renal cystic rupture because of the presence of autosomal dominant polycystic kidney disease, acquired cystic disease, or tuberous sclerosis (13–16). The kidneys reside in the retroperitoneal space, but large cysts that hemorrhage may expand and erode into the peritoneum or otherwise inflame it, resulting in bleeding.

For the PD clinician, the approach to hemoperitoneum has been well described (1). The condition is usually benign, but a more significant presentation must be expeditiously excluded by assessing for hemodynamic stability and using a targeted physical exam to exclude abdominal distention or pain. A careful history should attempt to identify the earliest symptom heralding the presentation—such as retroperitoneal pain that may suggest renal cyst rupture or another retroperitoneal process rather than an abdominal complaint. Any history of trauma, coughing, heavy lifting, or medical procedures should be noted. Laboratory testing should be directed toward determining the presence of any coagulopathy and the trend in hemoglobin. Patients found to have more rapid bleeding should be referred to surgical consultants for imaging and intervention, if needed.

As mentioned, most cases of PD-related hemoperitoneum are benign and, in women, may be related to either menstruation or ovulation. Determining the onset of hemoperitoneum with respect to the menstruation–ovulation cycle can be an important component of the assessment.

Once the hemoperitoneum is determined to be benign, it can be managed with a variety of conservative measures. As mentioned, flushes with room-temperature dialysate can irrigate the peritoneal cavity, removing blood and reducing the

risk of clots within the catheter and also inducing blood vessel constriction because of the fluid's cool temperature (3). Anticoagulants can be added to the dialysate to prevent clotting within the peritoneum or catheter lumen.

Summary

In PD patients, hemoperitoneum can come from a variety of intraperitoneal and retroperitoneal sources. Retroperitoneal sources of hemoperitoneum are less well recognized and include retroperitoneal hematomas, renal cystic bleeding, iliopsoas hematomas, and retroperitoneal pathology such as malignancy or cirrhosis-related varix. Flank pain or back pain heralding the onset of hemoperitoneum may alert the clinician to a retroperitoneal source.

Disclosures

Dr. Guest is an employee of Baxter Healthcare Corporation.

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