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Acute Abdomen from a Femoral Venous Catheter

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Introduction

Central venous hyperalimentation has proven life-saving benefits. The procedure has been used with increasing frequency in patients with gastrointestinal dysfunction since 1968 when Dudrick et al demonstrated its efficacy.¹ There are three standard modes of central venous access for the administration of hyperalimentation: jugular, subclavian, and femoral. The use of femoral venous catheterization has been increasing in frequency because of the ease of insertion and morbidity equal to that of the other sites of access.²

This report describes three patients with extravasation of hyperalimentation from a femoral venous catheter. All patients presented with an acute abdomen. We used the knowledge gained from the exploratory celiotomy in the first patient to correctly diagnose and treat the subsequent two patients without surgery.

Patient Reports

Patient 1

A 6-year-old girl with a medulloblastoma had a tunneled saphenous vein Silastic® catheter placed for hyperalimentation and chemotherapy. One month later, the patient developed progressive abdominal pain over a 48-hour period. The patient had a temperature of 39.4°C, signs of peritonitis, a leukocyte count of 23,000/cc³; abdominal radiographs revealed an ileus pattern. The patient underwent exploratory celiotomy. Exploration revealed ascites and retroperitoneal edema. Venography performed through the femoral catheter demonstrated extravasation in the retroperitoneum and iliac vein thrombosis (Fig. 1A). The catheter was removed, and in 48 hours the patient was tolerating clear liquids.

Patient 2

A 14-month-old girl with bronchopulmonary dysplasia required intravenous access. Forty-eight

hours after a percutaneous polyurethane left femoral venous catheter was placed and hyperalimentation instituted, the patient developed lethargy and hemodynamic instability. The patient had a temperature of 40°C; a firm, distended, tender abdomen; and a leukocyte count of 37,500/cc³. Abdominal radiographs revealed an ileus pattern. The femoral catheter was aspirated without blood return. A venogram via the femoral catheter revealed extravasation into the peritoneum (Fig. 1B). Peritoneal paracentesis yielded 20 mL of thin, white fluid consistent with hyperalimentation; analysis revealed no microorganisms. The femoral catheter was removed and the patient's gastrointestinal function returned within 24 hours.

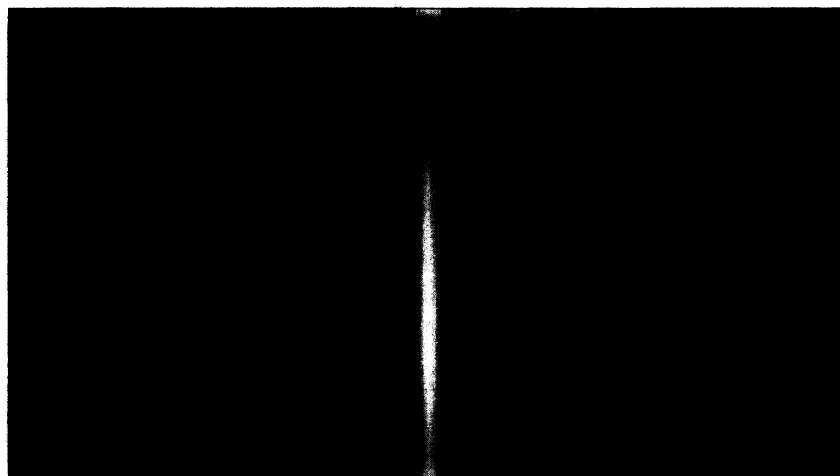
Patient 3

A 7-year-old boy with chronic lung disease was admitted to the intensive care unit with respiratory failure. The patient required a central venous catheter for intravenous access. Forty-eight hours after a percutaneous polyurethane left femoral venous catheter was placed and hyperalimentation started, the patient developed a temperature of 40.4°C and a distended, tense abdomen with generalized guarding. He had a leukocyte count of 41,000/cc³, and abdominal radiographs revealed a nonspecific gas pat-

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A **B**
Figure 1A. Venogram via left femoral catheter: retroperitoneal extravasation (black arrow), iliac vein thrombosis (white arrow) and filling of tributary vessels. **1B.** Venogram via left femoral catheter: retroperitoneal extravasation (white arrow).

tern. Blood could not be aspirated from the catheter, and extravasation of hyperalimentation was suspected. Peritoneal paracentesis yielded a thin, white fluid with a negative gram stain. The catheter was removed and within 72 hours the patient had a soft abdomen and return of gastrointestinal function.

Discussion

Central venous access has become common practice. Up to 1.6% of all hospitalized infants require a central venous catheter.² The most popular route for the central venous catheter has been the subclavian vein. However, the femoral vein is becoming the preferred site in critically ill patients because the complication rate is not as high as once believed and it offers ease of insertion.²

Complication rates from central venous catheters vary from 3% to 28% in the neonatal and pediatric intensive care unit population.^{3,4} The most common complications are venous thrombosis, extravasation, bleeding, embolization, infection, pneumothorax,

and extremity edema.^{3,5} Extravasation from the subclavian and jugular routes can cause cardiac tamponade and a hydrothorax, both life-threatening emergencies.⁶⁻⁸

Femoral venous catheter extravasation is exceedingly rare. It can occur intraperitoneally, retroperitoneally, or in the anterior abdominal wall, all of which situations can present as an acute abdomen.^{9,10}

This report describes three patients who had femoral venous catheters for central venous access and hyperalimentation. All patients developed fever, leukocytosis, and abdominal findings consistent with peritonitis. The knowledge gained from the first patient was used to avoid an unnecessary celiotomy to confirm the diagnosis in the subsequent two patients. Venography by the femoral catheter and peritoneal paracentesis allowed prompt diagnosis. The three patients improved dramatically; their gastrointestinal functions returned within 72 hours of catheter removal.

We recommend that femoral venous catheters be monitored for intravenous position and pa-

tency by aspiration. If the patient develops abdominal pain, distention, ileus, or fever, the femoral catheter should be checked for intravenous location by aspiration. Venography should be performed through the catheter to confirm the catheter's position and to rule out extravasation. If the diagnosis is still in question, peritoneal paracentesis can be performed. Removal of the malpositioned femoral catheter is sufficient therapy.

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