

## Case Report

# Retroperitoneal Hematoma as a Serious Complication of Endovascular Aneurysmal Coiling

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Retroperitoneal hematoma (RH) due to radiologic intervention for an intracranial lesion is relatively rare, difficult to diagnose, and can be life-threatening. We report a case of RH that developed in a patient on anticoagulant therapy following endovascular coiling of a ruptured anterior communicating artery (AcoA) aneurysm. An 82-year-old man presented with a 12-day history of headache. Computed tomography (CT) on admission demonstrated slight subarachnoid hemorrhage, and left carotid angiography revealed an AcoA aneurysm. The next day, the aneurysm was occluded with coils via the femoral approach under general anesthesia. The patient received a bolus of 5,000 units of heparin immediately following the procedure, and an infusion rate of 10,000 units/day was initiated. The patient gradually became hypotensive 25 hours after coiling. Abdominal CT showed a huge, high-density soft-tissue mass filling the right side of the retroperitoneum space. The patient eventually died of multiple organ failure five days after coiling. RH after interventional radiology for neurological disease is relatively rare and can be difficult to diagnose if consciousness is disturbed. This case demonstrates the importance of performing routine physical examinations, sequentially measuring the hematocrit and closely monitoring systemic blood pressures following interventional radiologic procedures in patients with abnormal mental status.

**KEY WORDS :** Cerebral aneurysm · Coil · Interventional radiology · Complication · Retroperitoneal hematoma.

## INTRODUCTION

Although most cases of retroperitoneal hematoma (RH) are associated with blunt trauma or rupture of a diseased abdominal artery, interventional radiologic misadventure is another etiology<sup>3,6,8,14,16</sup>. This is a relatively rare but serious complication of femoral artery catheterization<sup>2-12,14-15,17-19</sup>. Interventional radiologists and cardiologists have identified predisposing factors, typical presentation, and clinical course of this iatrogenic complication<sup>3,5,6,9,11,14,19</sup>. However, only a small number of cases of RH have been reported following interventional neurologic procedures.

Post-angiographic RH are often difficult<sup>4,13-15,17,19</sup> to diagnose and can masquerade as other abdominal disorders. Symptoms are nonspecific and include abdominal pain, back pain and lower extremity pain, with abdominal distention being

the most common sign<sup>6</sup>. We report a case of RH following endovascular coiling of a ruptured anterior communicating artery aneurysm, with emphasis on the difficulty in diagnosing RH in patients with disturbed consciousness.

## CASE REPORT

An 82-year-old man presented to the hospital with a 12-day history of headache. Computed tomography (CT) on admission revealed a slight subarachnoid hemorrhage. His Hunt & Hess grade (H&H) grade was I. Left carotid angiography via right femoral artery access demonstrated a small aneurysm of the anterior communicating artery (AcoA). The next day, endovascular coiling was performed via right femoral artery access. A 6-French sheath was inserted followed by catheterization of the left internal carotid artery with the patient under general anesthesia. A SL-10 microcatheter (Boston Scientific/Target) was inserted into the aneurysm, and it was occluded with Matrix coils (Boston Scientific/Target) and HydroCoils (MicroVention, Inc., Aliso Viejo, CA, USA). Three complex coils were delivered within the aneurysm lumen, including a 9 mm/25 cm coil, a 7 mm/21

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cm coil, and a 2 mm/2 cm coil. Digital subtraction angiography at the end of the procedure showed stenosis at the bifurcation of the A1 and A2 segments of the left anterior cerebral artery. However, obliteration of the aneurysm dome was complete. The patient received a bolus of 5,000 units of heparin immediately following the procedure, and thereafter, heparin was infused at a rate of 10,000 units per day. During the perioperative period, we continued to check vital signs, conduct physical examinations and record neurological findings. The patient failed to regain consciousness, and plain CT (Fig. 1) 20 hours after coiling revealed iatrogenic cerebral infarction in the distribution of the left anterior cerebral artery. Up to this point in time, vital signs were normal. The patient became increasingly hypotensive beginning 25 hours after coiling. On physical examination, the patient was pale with marked abdominal distention. Abdominal/pelvic CT (Fig. 2) and roentgenograms demonstrated a large retroperitoneal mass on the right side, and the patient was transferred to the Emergency and Critical Care Department. Abdominal angiography was conducted via right femoral artery access. We did not identify the source of hemorrhage. The puncture site for endovascular coiling was absolutely under the inguinal ligament. The hematocrit continued to fall, and the patient remained hypotensive despite multiple blood transfusions. An emergency laparotomy was performed, but the patient died of multiple organ failure five days after surgery.

## DISCUSSION

Kent et al.<sup>6</sup> reviewed 9,585 femoral artery catheterizations and reported 45 cases (0.5%) of RH. These authors also reported that the incidence of RH after coronary artery stent placement with anticoagulation was 3%.<sup>6</sup> Bejjani et al.<sup>2</sup> also reported one case of RH after angioplasty with anticoagulant therapy for cerebral vasospasm following subarachnoid hemorrhage. Quint et al.<sup>11</sup> reported the role of femoral vessel

catheterization and altered hemostasis in the development of extraperitoneal hematoma. Therefore, the anticoagulant or thrombolytic therapy should be considered to a risk factor for the post-catheterization RH<sup>1,8,9,13,16,18,19</sup>. Quint et al.<sup>11</sup> also studied 44 cases of RH with catheterization and altered hemostasis and suggested that these hematomas usually arise from a vessel that is distant to the puncture site.

When the hematoma is not adjacent to the punctured vessels, a hemorrhagic diathesis is the most likely etiology of the hemorrhage. Sreeram et al.<sup>14</sup> also found, that post-catheterization anticoagulation and high arterial puncture were significant risk factors. In this case, RH occurred ipsilateral to the punctured femoral artery, and the puncture site was absolutely under the inguinal ligament, however, the needle was inserted at an angle, and the tip of the needle may have reached the retroperitoneal space.

The diagnosis of RH is difficult because its symptoms mimic other conditions<sup>3,4,6,15,19</sup>. Signs and symptoms are non-specific and include suprainguinal tenderness and fullness in 100% of cases, severe back and lower quadrant pain in 64% of cases, and femoral neuropathy in 36% of patients<sup>6</sup>. Sharp et al.<sup>13</sup> reported six cases of hematomas after femoral vein cannulation for hemodialysis. In all cases, the diagnosis was made based on symptoms and abdominal radiography. Haviv et al.<sup>3</sup> reported a case of acute right lower quadrant abdominal pain which was misdiagnosed as acute appendicitis based on abdominal CT. Neurologic signs, such as lower extremity pain, can result from compression of the femoral nerves.

However, when the patient cannot complain of pain, a definitive diagnosis still can be made by CT<sup>4,6</sup>. A disturbance in the level of consciousness is not uncommon in patients with subarachnoid hemorrhage, acute phase middle cerebral artery embolism, cerebral vasospasms after subarachnoid hemorrhage, and ruptured arteriovenous malformation. Anticoagulant or thrombolytic therapy is commonly used, after the interventional procedures have been completed. Such

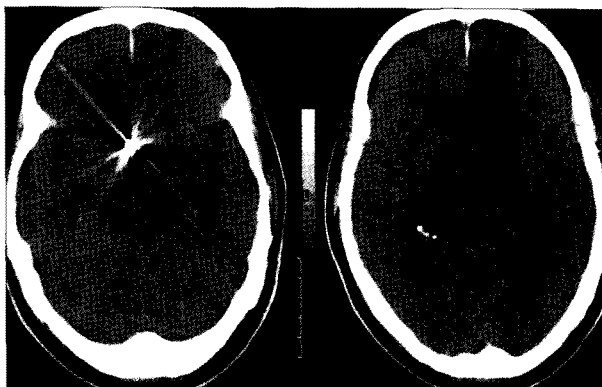


Fig. 1. Brain computed tomogram 20 hours after endovascular coiling of anterior communicating artery aneurysm. A low density area is seen on the left anterior cerebral artery territory.



Fig. 2. Abdominal computed tomogram at the L3 level 26 hours after endovascular coiling of the anterior communicating artery aneurysm. A huge retroperitoneal hematoma is visible on the right side.

patients are at increased risk for retroperitoneal hematoma. During the perioperative period, we continued to check the vital signs, conduct physical examinations and record neurological findings, however we could not find evidence for a retroperitoneal hematoma. Unfortunately, because of consciousness disturbance due to post-operative cerebral infarction and general anesthesia, it was more difficult to find indications of a retroperitoneal hematoma perioperatively. Situations of consciousness disturbance like this case are not rare for patients with coiling for a ruptured aneurysm. When the level of consciousness is depressed, physical examination, serial hematocrits and close monitoring of the systemic blood pressure should be routinely performed.

**CONCLUSION**

Retroperitoneal hematoma after interventional radiology for neurological disease is relatively rare and can be difficult to diagnose, especially if consciousness is disturbed. This case demonstrates the importance of performing routine physical examinations, sequentially measuring the hematocrit and closely monitoring systemic blood pressures following interventional radiologic procedures in patients with abnormal mental status.

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