

Massive retroperitoneal hemorrhage secondary to femoral artery puncture

A case report and review of literature

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Abstract

Rationale: A rare case of massive bleeding with rupture of the branch artery deriving from uterine artery was reported in the present study.

Patient concerns: A 29-year old female patient received embolism of malformed cerebral vessels. Ten hours after the operation, a sudden drop in blood pressure occurred. The patient developed coma and shock, and again underwent interventional angiography, which revealed bleeding at the right femoral artery puncture site of the first interventional procedure. The bleeding sign disappeared by pressure dressing. At 19 hours after stable condition, blood pressure fell again, and it was considered that recurrent bleeding occurred at the femoral artery puncture point. Therefore surgical suture of punctured blood vessel was performed. Then the condition was stabilized again. After another 20 hours, the third times blood pressure dropped. The third interventional angiography displayed a rupture of the branch artery deriving from the right uterine artery. Blood pressure of the patient elevated after embolism of right uterine artery, and the condition gradually stabilized.

Diagnoses: The massive bleeding with rupture of the branch artery deriving from uterine artery seconded huge retroperitoneal hematoma after femoral artery puncture.

Interventions: The patient underwent three times interventional treatment including an embolism of malformed cerebral vessels, a right femoral artery interventional treatment, an embolism of the branch artery deriving from the right uterine artery and one time of surgical suture of punctured blood vessel.

Outcomes: Half a month of comprehensive treatment later, the patient was discharged from the hospital.

Lessons: Massive bleeding with rupture of branch of artery deriving from the uterine artery following grain retroperitoneal hemorrhage is extremely rare, to the best of our knowledge, it has not been previously reported. The rupture of branch of artery deriving from the uterine artery should be considered as one the differential diagnosis in the retroperitoneal hemorrhage when the bleeding cause was not found. Endovascular trans-arterial embolism was a safe, effective, and minimally invasive therapeutic option.

Abbreviations: CT = computed tomography, CTA = computed tomography angiography, DSA = digital subtraction angiography, ICU = intensive care unit.

Keywords: bleeding, femoral artery puncture, massive retroperitoneal hemorrhage, ovarian artery

1. Introduction

There are many reasons for retroperitoneal hemorrhage, including tumor, infection, abnormal blood coagulation, vascular malformation, liver and kidney rupture caused by trauma or surgery, biopsy, femoral artery puncture site bleeding, and rupture of pseudoaneurysm in the ovarian artery.^[1–12] Serious

hemorrhage patients may manifest hemorrhagic shock and obvious local symptoms of oppression, and most patients have complicated and dangerous conditions.^[2,3] Hence, it is one of the difficult problems in clinical diagnosis and treatment. Bleeding from the puncture site of the femoral artery and rupture of the ovarian artery alone may cause retroperitoneal hemorrhage, and the successive occurrence of both in a single patient made the condition more dangerous and complex, and greatly increased the difficulty of diagnosis and treatment. The patient developed 3 severe hemorrhagic shocks within 3 days after undergoing neurological intervention and was finally successfully rescued through an operation and 2 interventions.

2. Case report

A 29-year old female patient presented with coma for the first time at 10 hours after receiving neurological intervention. The patient's heart rate was 170 bpm, blood pressure reduced to 65/37 mm Hg, and the patient presented with polypnea. Hypovolemic shock was considered. After a series of rescue measures such as massive fluid infusion, blood transfusion, and albumin supplementation, the patient's blood pressure improved, and the condition became relatively stable. Emergency bedside-ultrasound revealed abdominal bleeding, and cranial computed

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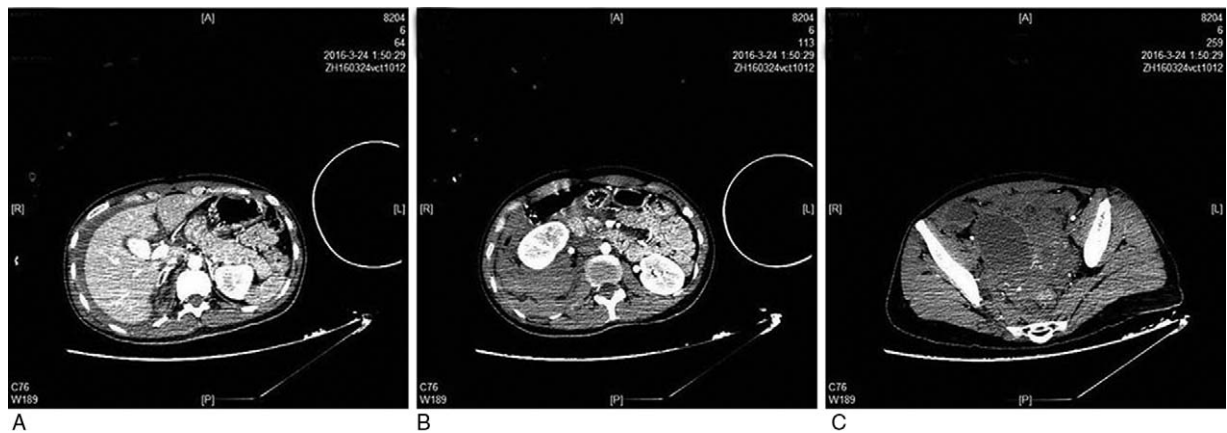


Figure 1. Large hematomas in retroperitoneal areas such as the perihepatic, perirenal, and pelvic areas are shown.

tomography (CT) revealed new irregular, elongated dense shadows in the left parietal cortex, which met changes after vascular intervention. Total abdomen enhanced CT revealed multiple hematoceles in the right retroperitoneal areas, such as the perihepatic and perirenal areas (Fig. 1). Emergency digital subtraction angiography (DSA) revealed that there was no obvious extravasation of contrast medium in the celiac trunk, superior mesenteric artery, inferior mesenteric artery, bilateral renal artery and left iliac artery, and the superior mesenteric artery moved to the right. Right iliac artery angiography revealed that at the end of the external iliac artery and the migrated segment of the femoral artery, the backward and outward extravasation of the contrast agent could be observed. Compression bandage was performed after local compression, and signs of the extravasation of contrast agents disappeared in the next angiography (Fig. 2). The patient was sent to the Nerve Intensive Care Unit (ICU).

The patient's condition was stable for a certain period of time. However, at approximately 30 hours after neurological intervention and 19 hours after femoral artery angiography, the hemoglobin level of the patient decreased slightly for the second time, the general indexes revealed no improvement, heart rate was 140 bpm, blood pressure was 80/50 mm Hg, blood coagulation function test revealed an obviously abnormal result, and blood gas analysis revealed severe acid-base disturbance.

The patient underwent exploratory operation of the vessels in the right inguinal region under general anesthesia, which revealed a 2-mm diameter defect in the anterior wall of the right common femoral artery, with active bleeding. Femoral artery repair was performed. The operation was smooth, and the intraoperative bleeding was estimated to be approximately 50 mL.

The patients received continuous infusion of red blood cells, platelets, and fresh plasma. However, at 52 hours after neurological intervention, the patients revealed a third decrease in the hemoglobin level, and hemochrome was once reduced to 4.9 g/L. Hemorrhagic shock occurred again, heart rate was 170 bpm, blood pressure was 120/65 mm Hg, and blood oxygen saturation was 85%. The patient was in a mild coma. Emergency CTA revealed suspicious abnormal enhancement in the right pelvic cavity (Fig. 3). Therefore, angiography was performed under the aid of endotracheal intubation and ventilator-assisted respiration *via* the brachial artery puncture, which revealed obvious hemorrhage signs in the suspected ovarian branch that derived from the right uterine artery. The signs of bleeding disappeared after embolization with a small amount of gelatin sponge particles (Fig. 3). The blood pressure of the patient elevated after embolization, and hemochrome increased.

After the third interventional treatment, in addition to receiving infusion of blood and proteins and other supportive

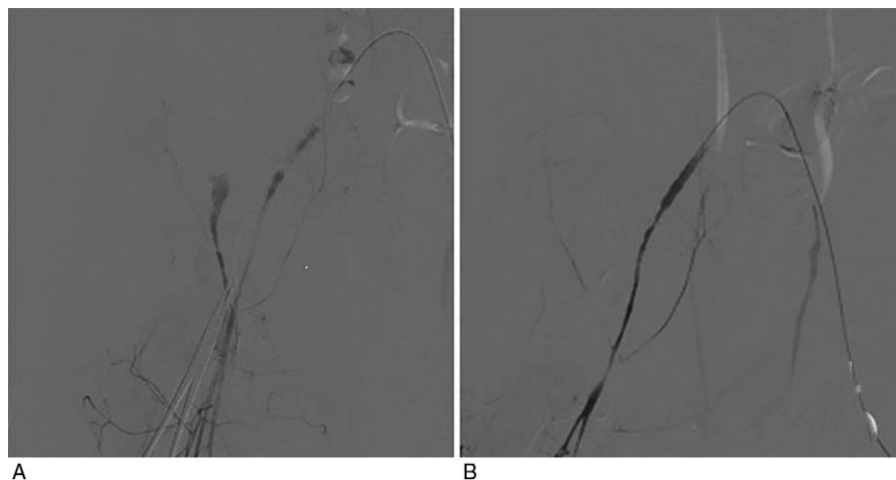


Figure 2. (A) Right femoral arteriography presented with a column extravasation of contrast medium; (B) the extravasation of the contrast medium disappeared.

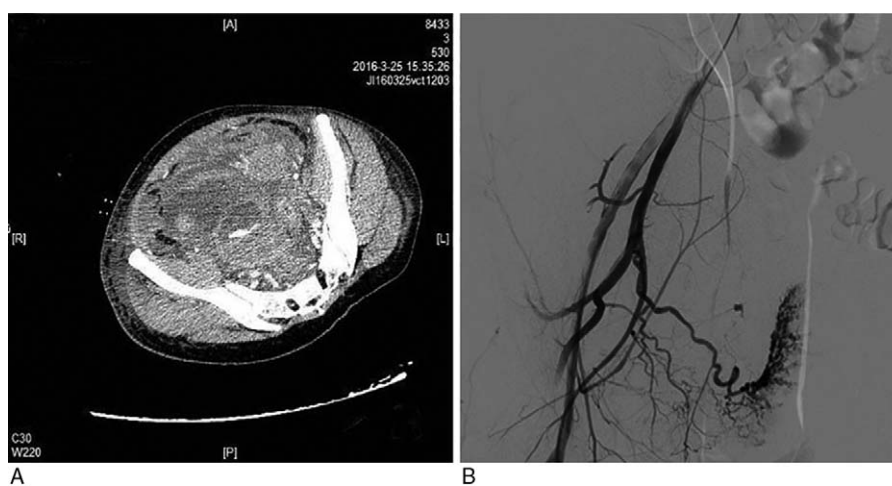


Figure 3. (A) An abnormal enhancement point in the pelvis was present. (B) A thin vessel that derived from the right uterine artery presented with signs of bleeding.

treatments, the patient underwent drainage of the hematoma. After half a month of comprehensive treatment, the patient was discharged from the hospital.

I confirm that I have read the Editorial Policy pages. This study was conducted with approval from the Ethics Committee of Changsha central hospital. This study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from participant's guardian.

3. Discussion

Massive retroperitoneal hemorrhage is one of the most difficult diseases in clinic. Its etiology is complicated due to the many reasons for bleeding. Spontaneous rupture of vascular malformations, rupture of tumors, trauma, surgical complications, complications of bone marrow puncture, and complications of femoral artery puncture can directly lead to retroperitoneal hemorrhage or retroperitoneal hematoma; and congenital abnormalities of coagulation function and long-term use of anticoagulant drugs are the causative factors of retroperitoneal hematoma.^[1-9] The patient in the present study had a definite history of femoral artery puncture. Although the right femoral artery puncture site was well-dressed in the medical examination without hematoma or oozing of blood, we still could not rule out this factor. Furthermore, it is also difficult for clinicians to determine the site of bleeding in a timely and accurate manner, requiring clinicians to have extensive clinical experience. Ultrasound, CT, DSA, and other means of detection can be used to accurately detect these bleeding sites. This patient presented with the sudden increase of heart rate, blood pressure drops, shock, and coma at 10 hours after embolization for cerebral arteriovenous malformation. Emergency enhanced CT revealed that the diaphragm muscle moved upward, massive deposits of blood occurred around the liver and right kidney, the right kidney moved forward and pelvic hematoma occurred, but the bleeding site remained unknown. Emergency DSA revealed that at the right lateral iliac artery and the migrated segment of the femoral artery, the contrast medium moved upward and backward. Moreover, the condition of patients with retroperitoneal hemorrhage is often very dangerous, since the rapid decrease in blood volume and severe compression of important organs can lead to organ failure and death.^[7] The patient suffered from

shock and coma within 1 hour of the increase in the heart rate and the initial drop in blood pressure, and it was the effective hemostasis and supplement of blood volume that provided a chance for the patient to be rescued.

At 52 hours after neurological intervention, the patient revealed a third decrease in hemoglobin, and hemochrome was once reduced to 4.9 g/L. The patient developed severe hemorrhagic shock again, heart rate was 170 bpm, blood pressure was 120/65 mm Hg, and blood oxygen saturation was 85%. The patient progressed into a mild coma status. Emergency CTA revealed suspicious abnormal enhancement in the right pelvic cavity. Therefore, angiography was performed under the aid of endotracheal intubation and ventilator-assisted respiration *via* the brachial artery puncture, which revealed obvious a hemorrhage sign in the suspected ovarian branch that derived from the right uterine artery. The signs of bleeding disappeared after embolization with a small amount of gelatin sponge particles. Then, the blood pressure of the patient elevated, and hemochrome increased. Apparently, rupture of the ovarian artery is one of the gynecologic emergencies. Spontaneous rupture and bleeding of ovarian artery pseudoaneurysm, and spontaneous rupture and bleeding of the ovarian artery have been reported.^[1-3] The diagnosis of simple ovarian rupture and bleeding is difficult,^[1-3,10] and the rupture and bleeding of the ovarian artery secondary to massive retroperitoneal hematoma adds to the difficulty of the diagnosis. Enhanced CT or CTA played an important role in the investigation of the cause of the third shock. At the third time, the patient presented with a drop in blood pressure and a decrease in hemoglobin. CTA revealed abnormal enhancement of the pelvic retroperitoneal area on the arterial phase, and DSA revealed rupture of the distal end of the suspected ovarian artery. The main cause was that the compression of retroperitoneal hematoma caused changes in the locations of the abdominal and pelvic organs, and the blood vessels were excessively retracted. Due to massive blood loss, coagulation disorders also played a part in ovarian artery bleeding.^[10-13] The rupture of the ovarian artery secondary to retroperitoneal hematoma is rare, which has not been reported to date.

In summary, retroperitoneal hematoma and ovarian artery hemorrhage are complicated and sometimes dangerous diseases in clinic. There are many reasons for these diseases. When we diagnose and deal with such diseases, we should carefully analyze the clinical characteristics of the patients and analyze them

comprehensively. CTA and DSA are effective methods of diagnosis and treatment for these diseases.

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