

Retroperitoneal Hematoma as a Complication of Anticoagulation Therapy with Heparin

Gaby Jabbour¹, Rachel Beekman², Taylor Powell³, Kevin Gobeske⁴

ABSTRACT

Aim: We report the case of a large spontaneous retroperitoneal hemorrhage in a patient receiving a heparin infusion. He was treated by blood transfusion, reversal with protamine, and angioembolization.

Background: Spontaneous retroperitoneal hemorrhage can present as a rare life-threatening event characterized by sudden onset of bleeding into the retroperitoneal space, occurring in association with bleeding disorders, tumors, or anticoagulation.

Case description: We report the case of a patient with central cord syndrome who was treated with heparin infusion for upper limb deep vein thrombosis. This was complicated by a large spontaneous retroperitoneal hemorrhage, which was treated by blood transfusion, reversal with protamine, and angioembolization. Retroperitoneal bleeding is a medical emergency that is often difficult to diagnose due to its rarity and the nonspecific symptoms with which it presents. Treatment may vary. In our case, blood transfusion, reversal of heparin with protamine, and interventional treatment were performed as active bleeding was recognized on angiography.

Conclusion: Idiopathic retroperitoneal hemorrhage is an uncommon condition that may lead to shock if not promptly recognized. Timely diagnosis and treatment help improve outcomes.

Clinical significance: This is a rare and challenging complication. Timely diagnosis requires high clinical suspicion. Management depends on hemodynamic stability. This case highlights the importance of early detection and treatment and opens the door for more studies to minimize related complications.

Keywords: Arterial embolization, Deep vein thrombosis, Heparin, Protamine, Spontaneous retroperitoneal hemorrhage.

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BACKGROUND

Spontaneous retroperitoneal bleeding is a rare condition, defined as bleeding in the retroperitoneal space without trauma or underlying pathology. It is associated with hematologic diseases, malignancies, vascular malformations, and systemic anticoagulation.¹ Minor trauma in the microcirculation with coagulopathy is a possible cause. Hemorrhage is the most important complication of unfractionated heparin in the initial treatment of deep venous thrombosis. Retroperitoneal bleeding is difficult to diagnose due to the nonspecific symptoms. It presents with abdominal pain, anemia, hemodynamic instability, and hemorrhagic shock in a patient with no obvious site of bleeding.

We report the case of a patient with central cord syndrome who was treated with heparin infusion for upper limb deep vein thrombosis. This was complicated by spontaneous retroperitoneal bleeding, causing hemorrhagic shock. He was treated by blood transfusion, reversal with protamine, and interventional radiology.

CASE DESCRIPTION

An 84-year-old male with a history of sinus node dysfunction (dual permanent pacemaker) and hypertension was admitted to our hospital after being a restrained driver involved in a low-speed motor vehicle collision. Initial Glasgow Coma Scale (GCS) was five, BP 90/60 mm Hg, HR 79 bpm, so he was intubated. The secondary survey was not significant for any obvious trauma, and FAST was negative. Pan-computed tomography (CT) scan revealed no traumatic injuries. His neurologic examination was significant for absent sensation below C2, with bilateral upper (1/5) and lower limbs (2/5) motor weakness. Magnetic resonance imaging (MRI)

^{1,2,4}Department of Neurology, Yale New Haven Hospital, Connecticut, USA

³Department of Radiology and Biomedical Imaging, Yale New Haven Hospital, New Haven, Connecticut, USA

Corresponding Author: Gaby Jabbour, Department of Neurology, Yale New Haven Hospital, Connecticut, USA, Phone: +1 914 310 8611, e-mail: gaby.jabbour@yale.edu,

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showed multilevel degenerative changes in the cervical spine, worst at C1–C2 and C3–C4 with moderate narrowing of the spinal canal. This was concerning for central cord syndrome, and he was taken on day 3 for C4–C5 decompression and C3–C6 posterior fusion. He was kept on noradrenaline and midodrine for a MAP goal >85 mm Hg. On day 2 postoperative he developed a fever. Duplex ultrasound revealed an occlusive left axillary vein deep venous thrombus, and an occlusive lower basilic vein thrombus. He was therefore started on heparin infusion with a PTT goal of 40–60 seconds. Two days later, the patient became hypotensive (MAP 50 mm Hg), and tachycardic (140 bpm) with increasing vasopressor requirements (noradrenaline and adrenaline). His hemoglobin dropped from 11.4 to 9.9 to 6.8 g/dL (Hematocrit 20%) over 12 hours. PTT was 50.4 seconds. Heparin was stopped, and three units of packed red blood cells were transfused.

CT scan showed a large $9.8 \times 24 \times 8.5$ cm hemorrhage involving the right retroperitoneum and bilateral psoas musculature with active extravasation (Figs 1 and 2). The decision was to give protamine 25 mg and go for an interventional radiology suite. Angiogram demonstrated small active extravasation from a right lumbar artery (Figs 3 and 4). After accessing the bleeding branch, no additional extravasation was seen, but prophylactic embolization with Gelfoam was performed. The final lumbar angiogram demonstrated no additional active bleed (Fig. 5). The patient was then closely monitored in our ICU, with no further hemodynamic compromise. During his hospital course, he had a tracheostomy and percutaneous endoscopic gastrostomy tube placement. His stay was complicated by right upper lobe segmental pulmonary emboli two weeks after the bleeding event, for which an Inferior Vena Cava (IVC) filter was placed. A week later, he was started on heparin infusion, then transitioned to apixaban 5 mg BID (*bis in die*, twice a day); and transferred to the floor where he had a cardiac arrest on day 2 and died.

DISCUSSION

Spontaneous retroperitoneal bleeding is rare with few cases reported in the literature. Most published cases involve patients receiving anticoagulants.² The pathophysiological mechanism is not clear; however, some studies suggest that occult vasculopathy and atherosclerosis of the small vessels could lead to rupture of friable vessels.³ Although there is no clear consensus regarding treatment, early detection results in a favorable outcome by reducing the time for hematoma development and minimizing surrounding tissue compression. The clinical presentation depends on the intensity and duration of the bleeding, which may have an insidious or sudden onset. Retroperitoneal bleeding should be suspected in patients presenting with abdominal pain and signs of hypovolemia, especially if they have a bleeding disorder or receive anticoagulants or antiplatelets. The classic triad of presentation (Lenk's triad) is present in 30% of cases and is characterized by abdominal pain, palpable mass and hypovolemic shock.⁴ Diagnosis remains challenging due to its rarity and nonspecific symptoms. MRI and CT imaging are superior to ultrasound and should be the primary investigation.⁵ There are no specific guidelines

regarding management. In hemodynamically stable patients on anticoagulants, a conservative approach with correction of the coagulation abnormalities and volume resuscitation is advised. Interventional treatment is helpful, and open surgery is reserved for hemodynamically unstable patients.⁶ The psoas muscle can accumulate up to 10 times its own volume and a psoas hematoma due to retroperitoneal hemorrhage can present with hypotension or a drop in hemoglobin⁷ as seen in our patient. Hemodynamically unstable patients with large hematomas can be treated with arterial embolization as it is minimally invasive with a quick therapeutic effect when compared to surgery.

In this case, the patient was started on heparin for deep vein thrombosis (DVT) treatment. The diagnosis was made after a CT scan that showed the hematoma. The treatment was with volume replacement, anticoagulation reversal, and intervention radiology; the patient progressed well and is awaiting transfer to a rehabilitation facility. Key strategies were reversing anticoagulation, proper resuscitation, and collaborating with the radiology team.



Fig. 2: Axial contrast-enhanced CT showing a large retroperitoneal hemorrhage occupying the entire right retroperitoneum containing mixed density hemorrhage with a hematocrit level

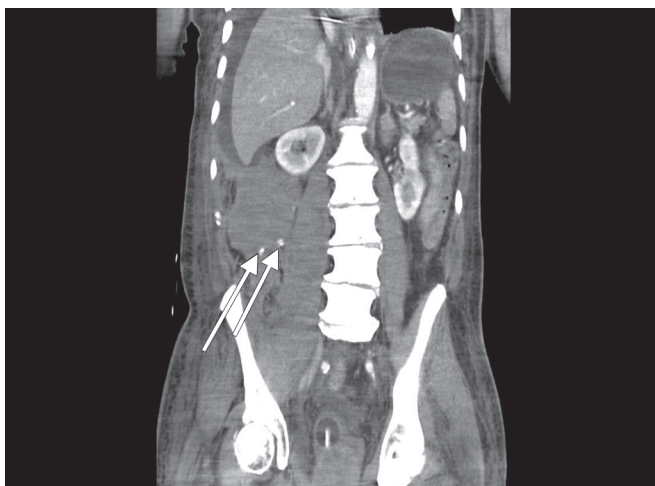


Fig. 1: Coronal contrast-enhanced CT showing a large retroperitoneal hemorrhage occupying the entire right retroperitoneum, containing mixed density hemorrhage with a focus of active extravasation (arrows)

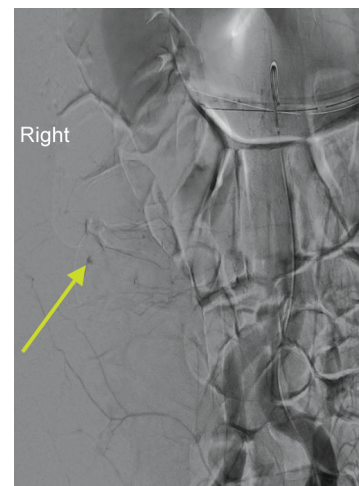


Fig. 3: Abdominal aortogram demonstrating continued active extravasation from a distal second-order branch from the right L3 lumbar artery (arrow)



Fig. 4: Selective angiogram of the right L3 lumbar artery demonstrating continued active extravasation from a distal second-order branch from the right L3 lumbar artery (arrow)

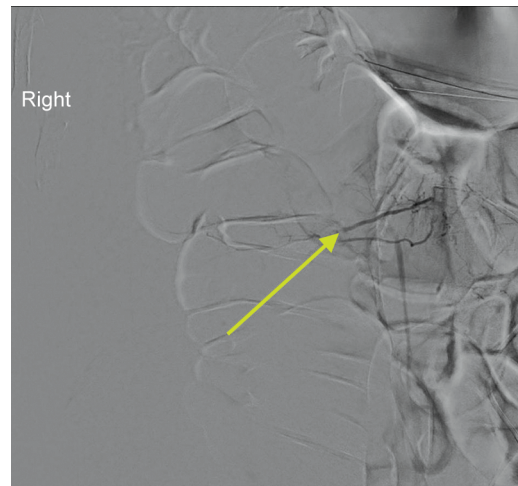


Fig. 5: Embolization was performed to stasis with Gelfoam slurry. Final L3 lumbar artery angiogram demonstrates cutoff of the embolized second-order vessel and no further extravasation

CLINICAL SIGNIFICANCE

Spontaneous retroperitoneal hematoma is the most infrequent retroperitoneal hemorrhage, causing significant morbidity. It usually presents with abdominal pain and hypovolemia. CT is the diagnostic modality of choice. Treatment depends on the patient's hemodynamic status. Physicians should always think of retroperitoneal bleeding in patients on anticoagulants who present with signs of hypovolemia. Early diagnosis and proper treatment can help reduce related morbidity and mortality.

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