International Surgery Journal
Juárez IN et al. Int Surg J. 2024 Jul;11(7):1161-1164
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20241747

Case Report

Non-traumatic spontaneous retroperitoneal bleeding: treated by interventional radiology

Ismael Juárez N.*, Gerardo M. Perdigón C., Luis Angel Fernández C., Denny M. Achicanoy P.

Department of Interventional Radiology, General Hospital Dr. Manuel Gea González, Mexico City, México

Received: 21 May 2024
Accepted: 17 June 2024

***Correspondence:**
Dr. Ismael Juárez N.,
E-mail: ismaeljuarez92@hotmail.com

ABSTRACT

Spontaneous retroperitoneal hemorrhage is defined as bleeding into the retroperitoneal space. It is a rare condition classified into traumatic and non-traumatic categories. The underlying causes are multifactorial. Hemorrhage from the lumbar arteries is generally the result of high-speed trauma or spinal instrumentation. Clinical manifestations vary primarily depending on the amount of bleeding. Computed tomography (CT) is the diagnostic modality of choice, helping to identify the presence, location, and guide therapy. Treatment options include conservative management, embolization, and/or surgery. A case is reported here that was diagnosed and treated by interventional radiology at general hospital Dr. Manuel Gea González. A GE revolution 64-slice abdominal CT with intravenous contrast (Ultravist 350) was performed, followed by endovascular treatment with microparticles (300-500 µm). This is a rare etiology documented in the literature. A case is reported here that was diagnosed and treated by interventional radiology at general hospital Dr. Manuel Gea González. A GE revolution 64-slice abdominal CT with intravenous contrast (Ultravist 350) was performed, followed by endovascular treatment with microparticles (300-500 µm). This is a rare etiology documented in the literature. It is a rare condition with high morbidity and mortality rates. First-line treatment is through interventional radiology.

Keywords: Hemorrhage, Retroperitoneum, Spontaneous

INTRODUCTION

Spontaneous retroperitoneal bleeding is defined as bleeding into the retroperitoneal space. It is classified into traumatic and non-traumatic. Non-traumatic cases were first reported in 1909; spontaneous etiology is a rare entity. Organs found in the retroperitoneum include the esophagus, aorta, inferior vena cava, kidneys, ureters, adrenal glands, rectum, duodenum, pancreas, and part of the colon. The variability in presentation and etiology makes diagnosis a challenge. Key symptoms include back pain, flank pain, inguinal pain, palpable abdominal mass, and shock. Clinical manifestations of spontaneous retroperitoneal bleeding constitute Lenk's triad: abdominal pain, shock, and non-pulsatile abdominal mass. Non-spontaneous causes include iatrogenic injury during surgical procedures. Spontaneous hemorrhage is a considerably rare cause. Clinical trials of hemorrhage have documented rates ranging from 0.6% to 6.6%, with a mortality rate of 20%.[1] CT is the imaging modality for diagnosis. Initial treatment aims at hemodynamic correction. Treatment modalities include conservative management, embolization, and surgery.[2] A case of great interest due to its rare etiology, high morbidity and mortality, as well as complex diagnosis and description of endovascular treatment. This case was diagnosed and treated at the general hospital Dr. Manuel Gea González. Our objective is to describe radiological findings, main causes, symptoms, as well as to describe the endovascular therapeutic technique performed in our institution, in order to contribute to the growing evidence regarding spontaneous retroperitoneal bleeding.

CASE REPORT

This concerns a 26-year-old female patient from Mexico City, with a history of systemic arterial hypertension diagnosed in 2022, being treated with nifedipine and irbesartan, hypothyroidism diagnosed in 2016 and currently on levothyroxine therapy, and chronic kidney disease undergoing renal replacement therapy with hemodialysis. In 2023, after placement of an intrauterine device, she experienced metrorrhagia on 2 occasions, estimated at up to 200 cc each time, along with generalized colicky abdominal pain of intensity 10/10 on the visual analog scale, without relieving or aggravating factors. She presented to a hospital where conservative treatment was initiated. An abdominal ultrasound revealed ascites, leading to the decision to perform an evacuative paracentesis of approximately 500 cc. External blood tests revealed a hemoglobin level of 5.04 g/dL, prompting her admission to emergency department of the general hospital Dr. Manuel Gea González. Upon admission, her vital signs were as follows: blood pressure 100/67 mmHg, heart rate 104 beats/min, respiratory rate 21 breaths per minute, oxygen saturation 99%, and temperature 37.7°C. Blood tests showed leukocytes 15.6×10^3/µL, neutrophils 12.7×10^3/µL, hemoglobin 5.3 g/dL, hematocrit 15.8%, and platelets 464×10^3/µL. Serum chemistries revealed glucose 84 mg/dL, urea 62 mg/dL, and creatinine 5.5 mg/dL. Coagulation tests showed a prothrombin time of 16.3 seconds and an international normalized ratio of 1.4. A contrast-enhanced abdominal CT scan was requested suspecting surgical pathology, revealing hemoperitoneum associated with a hematoma (91 HU density) located in the right perirenal space, with a calculated volume of 1103 cm³. An arterial jet dependent on right renal segmental artery was identified, along with a left subdiaphragmatic collection of 15 cc, a right subhepatic collection of 27 cc, a pelvic cavity collection of 23 cc, and right pleural effusion (Figure 1).

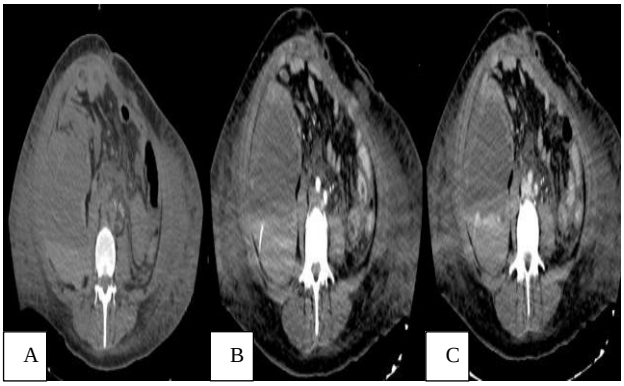

Figure 1 (A-C): Plain abdominal tomography of an amorphous image located in right retroperitoneal space, heterogeneous with areas of hemorrhagic density, with presence of fluid-fluid level. In arterial phase, an arterial jet is observed within image, suggesting active arterial bleeding, dependent on right lumbar artery and late arterial phase, arterial jet persists within the lesion.

A consultation was made to the interventional radiology department, where a diagnostic angiography showed contrast extravasation into the retroperitoneum from the right lumbar artery. Subsequently, transarterial embolization was performed using 500-700 µm microparticles, with angiographic control showing no evidence of active bleeding (Figure 2). After 24 hours, vital signs normalized. A contrast-enhanced CT scan performed 4 weeks later revealed an organized hematoma without evidence of active bleeding.

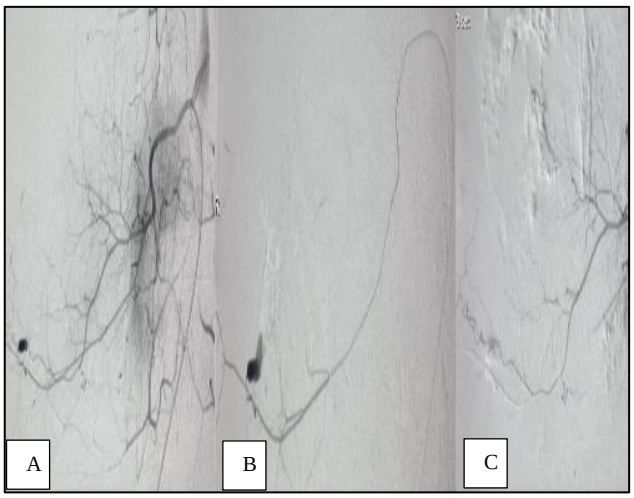

Figure 2 (A-C): Right common femoral artery puncture is performed using Seldinger technique, a 5 Fr arterial sheath is placed, a 0.035" hydrophilic guidewire mounted with a Cobra C2 catheter is inserted, and diagnostic arteriography is performed identifying contrast extravasation into retroperitoneum dependent on the distal branches of the right lumbar artery at the level of L3. A 0.021" straight microcatheter is advanced to distal branches of the right lumbar artery, and angiographic control is performed confirming contrast extravasation. Embolization is performed using 300-500 µm microparticles, and control is conducted, confirming complete embolization.

DISCUSSION

Retroperitoneal hemorrhage is defined as bleeding into the retroperitoneal space. Typically, patients are asymptomatic initially.[1] It is classified into traumatic and non-traumatic. Non-traumatic cases were first reported in 1909; spontaneous etiology is a rare entity. The retroperitoneum represents an anatomical space located immediately posterior to the abdominal cavity. It is divided into three anatomical regions, which are used to guide treatment and describe the localization of hematomas. The first region is called the anterior pararenal space. Its anterior boundary is the posterior parietal peritoneum, its posterior boundary is the anterior renal fascia, and its lateral boundary is the lateroconal fascia. It contains the inferior vena cava, the second and fourth portions of the duodenum, pancreas, and ascending

and descending colon. The perirenal space has the anterior renal fascia as its anterior boundary and the posterior renal fascia as its posterior boundary. This space contains both kidneys and adrenal glands. The posterior pararenal space has the posterior renal fascia as its anterior boundary and the posterior transverse fascia as its posterior boundary, containing only fat. Organs found in the retroperitoneum include the esophagus, aorta, inferior vena cava, kidneys, ureters, adrenal glands, rectum, duodenum, part of the pancreas, and part of the colon. The variability in presentation and etiology makes diagnosis a challenge. Key symptoms include back pain, flank pain, inguinal pain, palpable abdominal mass, and shock. Clinical manifestations of spontaneous retroperitoneal bleeding constitute Lenk's triad: abdominal pain, shock, and non-pulsatile abdominal mass. Non-spontaneous causes include iatrogenic injury during surgical procedures. Spontaneous hemorrhage is a considerably rare cause. Clinical trials of hemorrhage have documented rates ranging from 0.6% to 6.6%, with a mortality rate of 20%.[1] Non-traumatic etiologies include spontaneous or iatrogenic causes. Iatrogenic retroperitoneal hematomas result from percutaneous interventions or endovascular procedures. The incidence of retroperitoneal hematomas associated with percutaneous interventions is 0.06%. Spontaneous retroperitoneal bleeds are a rare entity, with a high degree of morbidity and mortality. While literature often associates patients with receiving anticoagulant therapy, up to 15% of patients do not receive any anticoagulant treatment.[1] Retroperitoneal hematoma is extremely rare, as most cases occur in association with trauma or similar causes of idiopathic hematoma. Establishing preoperative diagnosis is difficult due to the rarity of this entity, as well as its atypical clinical appearance. Chronic idiopathic retroperitoneal hematoma is quite rare.[2] Magnetic resonance imaging (MRI) plays a more useful role in diagnosing hematoma than CT, as it distinguishes between hemorrhagic and neoplastic collections, as well as pheochromocytoma or carcinoma. It is classified into three types depending on duration: acute stage (less than 7 days), subacute stage (from 7 days to 7 weeks), and chronic stage (after 7 weeks). In the chronic stage, a hypodense ring is observed in T1 and T2, attributed to hemosiderin deposits and the presence of a fibrous capsule.[2] The retroperitoneum has a rich blood supply, primarily from the lumbar arteries with multiple anastomoses with branches of the iliac and intercostal arteries.[3] CT is essential in detecting spontaneous retroperitoneal bleeding, as it is often clinically challenging. CT has a sensitivity of 100%. Active extravasation was identified in 80% of cases. In almost half of the cases (46.4%), patients are hemodynamically unstable.[4] Anatomically, from the first to fourth lumbar artery, it arises from the dorsal aspect of the abdominal aorta at the level of the transverse process; however, the fifth lumbar artery arises from the middle sacral artery. The lumbar arteries run laterally to the lumbar vertebral bodies. They anastomose with the intercostal, subcostal, epigastric, superior and inferior epigastric, and iliolumbar arteries.[5] Conventional treatment consists of hemodynamic support and analgesics. Early diagnosis has an impact on survival. In cases where clinical suspicion of ineffective conservative treatment arises, transcatheter arterial embolization (TAE) is considered.[6] Embolization can be done with coils, gel foam/liquid agents like cyanoacrylate (NBCA). Generally, the right common femoral artery is accessed, a 5/6 Fr vascular sheath is inserted, digital subtraction angiography is performed with a pigtail catheter, followed by advancement of a 4/5 Fr angiographic catheter, and then a 2.7 Fr microcatheter. The embolizing agent is deployed, and finally, a control angiography is performed.[7]

CONCLUSION

Spontaneous retroperitoneal bleeding is a heterogeneous entity. Among non-traumatic causes, spontaneous bleeding from a lumbar artery is a rare variety. Clinical manifestations are nonspecific; the Lenk triad-abdominal pain, shock, and non-pulsatile abdominal mass-is among the main symptoms. The primary imaging method for diagnosis is CT. Recognizing spontaneous retroperitoneal bleeding is challenging due to its nonspecific clinical presentation, especially as these patients lack a history of trauma. Management should involve multiple specialties, and initial treatment with conservative measures is imperative. Interventional radiology treatment should be reserved solely for unstable patients with poor response to conservative treatment.

ACKNOWLEDGEMENTS

Author would like to thank the interventional radiology department of the general hospital Dr. Manuel Gea González for their invaluable assistance, as well as the entire radiology and imaging department.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Juárez IN, Perdigón GMC, Fernández LAC, Achicanoy DMP. Non-traumatic spontaneous retroperitoneal bleeding: treated by interventional radiology. Int Surg J 2024;11:1161-4.