Annals of Medicine and Medical Sciences (AMMS)
Volume 04, 2025, *Page No.: 183 to 186*
Available at: *http://ammspub.com*

Case Report

OPEN ACCESS

Spontaneous Abdominal Hemorrhage: The Role of Endovascular Embolization - A Case Report

Dr Sangita Pandey [1], Dr Rumi Bhattacharjee *[2], MD, Dr Nakum Ghanshyam [3], Dr Rashmita Pal [4], Dr Hardi Patel [5], MS

[1]Assistant Professor, Department of Obstetrics and Gynaecology, Pramukhswami Medical College, Bhaikaka University, Karamsad, Anand, Gujarat, India.
[2]Professor, Department of Obstetrics and Gynaecology, Pramukhswami Medical College, Bhaikaka University, Karamsad, Anand, Gujarat, India.
[3]Third-Year Resident, Department of Obstetrics and Gynaecology, Pramukhswami Medical College, Bhaikaka University, Karamsad, Anand, Gujarat, India.
[4]Senior Resident, Department of Obstetrics and Gynaecology, Pramukhswami Medical College, Bhaikaka University, Karamsad, Anand, Gujarat, India.
[5]Second-Year Resident, Department of Obstetrics and Gynaecology, Pramukhswami Medical College, Bhaikaka University, Karamsad, Anand, Gujarat, India.

*Corresponding Author: Dr Rumi Bhattacharjee; *rumigynae@gmail.com*

Abstract

An intra-abdominal hemorrhage of non-traumatic origin, though rare, is a critical medical emergency. It can result from various causes, including visceral, gynecological, vascular issues, or coagulopathy. When worsened by anticoagulants, it can rapidly escalate into a life-threatening situation. Immediate intervention is essential, often requiring surgical exploration or endovascular embolization to prevent severe complications or death.
A 36-year-old woman with rheumatic heart disease, hypothyroidism, and a recent mitral valve replacement and tricuspid valve repair presented in shock, with 3 months of amenorrhea and symptoms of acute hemoperitoneum. Abdominal CT Aortography revealed a 12.5 x 9.5 x 9.2 cm intraperitoneal hematoma (550 cc), with active bleeding likely originating from a minor branch of the left uterine artery. The patient was on anticoagulants at the time. This case highlights a rare cause of spontaneous hemoperitoneum, where timely endovascular embolization led to a favorable clinical outcome.

Keywords: ***Spontaneous Abdominal haemorrhage, non-gravid, endovascular embolization, shock, uterine artery bleed.***

Introduction

Spontaneous abdominal hemorrhage is characterized as an intraperitoneal bleed of non-traumatic origin, and it is considered a rare clinical entity. This condition can arise from various causes, including visceral, gynecological, vascular, or coagulopathy-related factors. Despite its diverse etiologies, spontaneous abdominal hemorrhage is marked by nonspecific symptoms that can swiftly progress to hypovolemic shock, posing a critical challenge in both diagnosis and management [1].

In their comprehensive analysis, Ballista et al. have categorized the gynecological causes of spontaneous intraperitoneal hemorrhage into two distinct groups: tumor-related, such as endometrial and ovarian carcinoma, and non-tumor-related, including hemorrhagic ovarian cysts and ruptured ectopic pregnancies [1]. Notably, gynecological patients presenting with this pathology may be either gravid or non-gravid, highlighting the broad spectrum of potential underlying causes in this patient population [1].

In gravid patients, placental abruption and uterine rupture are common causes of hemoperitoneum, while uterine torsion and ruptured utero-ovarian vessels are rarer. In non-gravid patients, ruptured hemorrhagic ovarian cysts are the leading cause. This highlights the variability of causes of spontaneous abdominal hemorrhage across patient populations [1].

According to the International Society on Thrombosis and Hemostasis, a major bleed in any non-surgical patient is defined by one or more of the following criteria: (a) a fatal outcome, (b) bleeding in a critical area or organ accompanied by symptoms, or (c) hemodynamic instability, which may manifest as a decline in hemoglobin levels of ≥2 gm% or the need for a transfusion of ≥2 units of red blood cells or whole blood. Thoracic, airway, pericardial, intra-abdominal, retroperitoneal, intra-articular, and intramuscular hemorrhages are classified as critical bleeds due to their high potential for severe disability and the likelihood that surgical intervention may be required for effective control. In patients with mechanical heart valves, the incidence of such major bleeding events

Received: February 23, 2025; **Revised:** March 25, 2025; **Accepted:** April 04, 2025

ranges from 0.34 to 2.91 per 100 patient years [2]. In contrast, the use of vitamin K antagonists is associated with a median major bleeding rate of 2.1 per 100 patient-years [3]. Traditional risk factors for bleeding in these patients include a supratherapeutic international normalized ratio (INR) and the concurrent use of antiplatelet medications, both of which significantly elevate the risk of hemorrhage [2].

Case Description

A 36-year-old multiparous woman, with a history of two uneventful vaginal deliveries, presented with three months of amenorrhea and one day of acute, worsening abdominal pain. She also experienced multiple episodes of non-projectile vomiting. Abdominal ultrasonography revealed a mixed echogenic pelvic collection (9.0 x 5.6 cm) with no significant vascularity, while both ovaries were separate from the collection, and the uterus appeared normal.

The patient denied fever, cough, or trauma and had normal bowel and bladder habits. Her medical history included rheumatic heart disease (16 years ago), mitral valve replacement, tricuspid valve repair, and left atrial appendage plication 4 months prior. She also had a tubal ligation 12 years ago and hypothyroidism, for which she was taking irregular medication. At presentation, she was on acenocoumarol (3 mg) once a day, spironolactone, torsemide (10 mg) once a day, and metoprolol succinate (25 mg) once a day.

On examination, the patient was alert and oriented but showed marked pallor. Her vital signs included a pulse of 124 bpm, respiratory rate of 24 bpm, blood pressure of 90/60 mmHg, and oxygen saturation of 95%. An abdominal examination revealed left iliac fossa tenderness with cervical motion and left forniceal tenderness during the bimanual exam. A faintly positive urine pregnancy test (UPT) suggested a ruptured ectopic pregnancy, leading to a provisional diagnosis of hemoperitoneum. Initial stabilization included tranexamic acid, vitamin K, and furosemide. 2-D echocardiography showed a functioning prosthetic mitral valve with mild pulmonary artery hypertension. Cardiology review deemed the patient high risk for surgery and recommended fresh frozen plasma.

Laboratory results showed a haemoglobin of 6.1 gm%, a PT of 82.2 seconds, an activated partial thromboplastin time (APTT) of 52.5 seconds, and an INR of 8.67. Her TLC was 22.7 x 10^3/cu mm, platelet count 2.66 lakh/cu mm, and serum creatinine 1.16 mg%. Fibrinogen was 329.98 mg %, and thyroid function tests revealed TSH of 38.71 mIU/L, free T3 of 3.39 pmol/L, and free T4 of 8.73 pmol/L.

Blood tests showed a normal beta HCG (<2.0 mIU/ml). A fresh abdominal ultrasound revealed a large, heterogeneously hypoechoic pelvic collection with a prominent hyperechoic area and loculated regions with moving internal echoes. Color Doppler Flow Imaging showed a vascular structure with arterial and venous flow, suggesting a large hematoma with possible active bleeding from iliac vessel branches. A Contrast-Enhanced CT (CECT) was recommended.

The CT abdominal aortography, along with MDCT angiography of both lower limbs, revealed a large intraperitoneal hematoma measuring 12.5 x 9.5 x 9.2 cm, with an approximate volume of 550 cc. The imaging suggested areas of active bleeding, potentially originating from a minor branch of the left uterine artery.

The vascular surgery team recommended angioembolization of the left uterine artery, which was successfully performed using Gel foam and glue under local anaesthesia. On the second post-procedure day, tranexamic acid was discontinued, and the patient was started on Inj. Clexane/LMWH (0.6 ml) and 50 micrograms of Thyronorm. She was later transitioned to tablet Acitrom (2.0 mg).

Throughout her hospital stay, the patient received a total of 7 units of packed red blood cells (PRBCs), 7 units of fresh frozen plasma (FFP), and 2 units of platelet-rich plasma (PRP). She made a steady recovery and was discharged on the sixth postoperative day.

Figure 1: CT Angiography Sagittal section [plain]

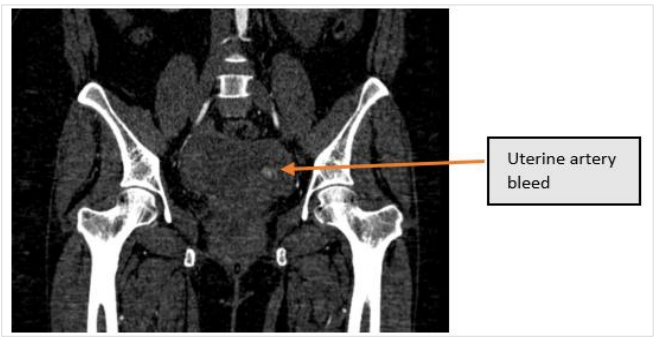

Figure 2: CT Angiography Sagittal section [Contrast]

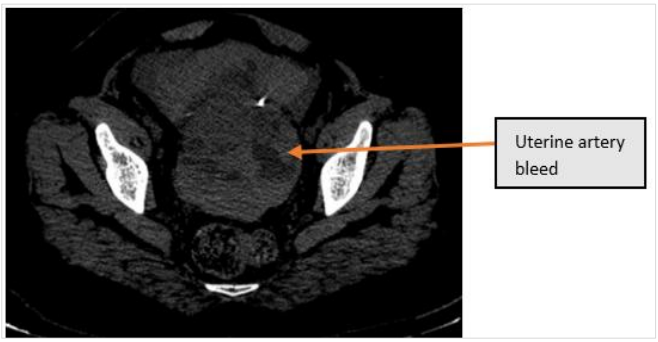

Figure 3: CT Angiography Axial section [Plain]

Figure 4: CT Angiography Axial section [Contrast]

Discussion

In this case, the bleeding was likely from the minor branches of the left uterine artery, as reported in previous studies. Vinken et al.

documented a spontaneous left uterine artery rupture in a 35-year-old non-gravid patient with a negative UPT [4]. Nathan et al. described a similar case in a 42-year-old patient with two live births [5]. Fiadjoe et al., reported endometriotic erosion involving the right uterine artery [6]. These cases highlight the diverse pathophysiology and presentations of uterine artery rupture.

The patient, with a history of hypothyroidism and inconsistent medication adherence, presented with prolonged menstrual cycles, oligomenorrhea, and amenorrhea. Saei Ghare Naz et al. suggest that dysfunction in the hypothalamic-pituitary-thyroid axis can disrupt the hypothalamic-pituitary-gonadal axis, leading to menstrual irregularities such as irregular bleeding, oligomenorrhea, and amenorrhea [7].

The patient, who had undergone tubal ligation, presented with a faintly positive urine pregnancy test. False positives can occur due to heterophilic antibodies or a physiological rise in HCG, such as in postmenopausal women, as noted by Soni S and Menon MC, when pregnancy and neoplasia are ruled out [8].

Massive spontaneous intraperitoneal bleeding is a known complication in women on anticoagulants, especially when haematological issues are present. Reports, such as those by Anitha et al. and Joshi KS et al., describe non-gravid cases following mitral valve replacement [9,10]. Anitha et al., reported a 35-year-old patient, P2 L2, also on warfarin, who presented with 1 month and 15 days of amenorrhea and a negative UPT. She experienced bleeding from an ovarian cyst, with a PT >120 seconds and a PTT of 75.5 seconds [9]. Joshi documented a 30-year-old on warfarin with a ruptured ovarian cyst and active bleeding [10], highlighting the risks of anticoagulation therapy in such cases.

Regardless of the underlying cause, whether gynaecological or non-gynaecological, maintaining a high index of suspicion is crucial when hemoperitoneum is suspected of spontaneous origin. This is particularly important as common symptoms such as abdominal pain, distension, and altered vital parameters are non-specific and can be misleading.

Ultrasonography is considered the primary imaging modality for evaluating a bleed of gynaecological origin, although its findings can be nonspecific. Images may vary, showing hypo, iso, or hyperechogenic appearances or even heterogeneous collections with a fluid-fluid level, as noted by Espil [11].

A CT scan, on the other hand, offers significant advantages, including precise localization of the organ or site of origin, identification of ongoing haemorrhage, assessment of the degree of bleeding, and the ability to estimate the time interval since the bleeding occurred. This is made possible by using varying Hounsfield units to differentiate between fresh, clotted, and lysed blood, as described by several authors [1,12].

Kamthornthanakarn et al. referenced the AHA/ACC/ATA guidelines, which recommend a target INR of 2.5-3.5 for patients with mechanical mitral valves. However, their study suggests a slightly lower range of 2.0-3.4, potentially more applicable to the Asian population [13].

The management of severe hemorrhage in patients on DOACs or VKAs with mechanical valve prostheses involves stabilizing the patient, reversing anticoagulation, addressing coagulopathy, and minimizing transfusion imbalances, with target levels for haemoglobin (>7 g/dL), platelets (>50,000 lakh/cu mm), and fibrinogen (>100 mg/dL). Hemostasis is then achieved through surgical, endoscopic, or angiographic interventions [14].

In addition to hemodynamic support, Piran et al. stress the importance of a detailed anticoagulant history, including drug type, dosage, and timing, as well as any antiplatelet use or renal disease [3]. Tomaselli et al., emphasize correcting hypothermia and acidosis to prevent worsening coagulopathy [15]. Huda SA et al. recommend using vitamin K with reversal agents like PCC, which is preferred over FFP due to its composition, room temperature stability, and lack of ABO compatibility [2].

The definitive management, following initial hemodynamic resuscitation, is contingent upon the available resources and expertise. Once the patient is stabilized, angiography followed by embolization has been proposed as the first-line therapy with surgical intervention reserved for those who remain persistently hypotensive or in cases where embolization fails [3]. However, Horer et al. have advocated for a "hybrid approach" of Endovascular Resuscitation and Trauma Management (EVTM), which combines endovascular therapies with open surgery to treat hemodynamically unstable patients [16]. In specific cases, Vinken et al., employed bipolar ligation of the ruptured uterine artery, while Nathan et al., utilized a Vicryl suture for hemostasis [4].

In our case, endovascular embolization was successfully employed as a minimally invasive procedure for controlled vessel occlusion, which can be used for hemodynamically stable and unstable patients. Autologous blood clots and gelatin sponges are commonly used as temporary sealing agents for vessels of varying calibers, while permanent agents such as micro coils and micro plugs are effective for both small and large vessels. For smaller vessels, particles, glue, and ethylene vinyl alcohol copolymer are utilized.

Although many patients on anticoagulants who present with massive hemoperitoneum, as described by Anitha et al. and Joshi *et al.* [9,10], typically require surgical intervention, Ghasemian Dizaj Mehr and Bahadori have reported two cases of patients on warfarin with ruptured ovarian cysts who were successfully managed conservatively [17].

Conclusion

A major intra-abdominal bleed is a critical emergency, and when it occurs in patients on anticoagulants, it can quickly escalate to life-threatening proportions. Prompt assessment, supportive care, and definitive management are essential, with surgical exploration or embolization often required in severe cases. Our case underscores a relatively rare cause of spontaneous hemoperitoneum, where timely and coordinated treatment, including the judicious use of endovascular embolization, led to a favorable outcome for the patient.

Declarations

Conflict of interest

None

Funding/ financial support

None

Ethical Clearance

Institutional Ethical Committee Approval was obtained. IEC/BU/Cr.11/80/2025

References

[1] Ballesta M, Piqueras R, Brugger S, Estellés Lerga P. Non-traumatic spontaneous abdominal haemorrhage.

Radiologia (Engl Ed). 2023 Mar;65 Suppl 1: S73-S80. doi: 10.1016/j.rxeng.2022.11.004. PMID: 37024233.

[2] Huda SA, Kahlown S, Jilani MH, Chaudhuri D. Management of Life-Threatening Bleeding in Patients with Mechanical Heart Valves. Cureus. 2021 Jun 13;13(6): e15619. doi: 10.7759/cureus.15619. PMID: 34277237; PMCID: PMC8276624.

[3] Piran S, Schulman S. Treatment of bleeding complications in patients on anticoagulant therapy. Blood. 2019 Jan 31;133(5):425-435. doi: 10.1182/blood-2018-06-820746. Epub 2018 Dec 17. PMID: 30559261.

[4] Vinken J, Emslie E, Smith S. Spontaneous Uterine Artery Rupture in a Nongravid Patient. J Minim Invasive Gynecol. 2024 May;31(5):360-361. doi: 10.1016/j.jmig.2024.02.015. Epub 2024 Mar 7. PMID: 38460866.

[5] Nathan JA, Chew Sze Yen V, Ab Manan NF. Spontaneous uterine artery rupture in a non-pregnant woman: a case report. Journal of Emergency Practice and Trauma 2023; 9(2): 127-129. doi: 10.34172/ jept.2022.3

[6] Fiadjoe, P., Thomas-Phillips, A. & Reddy, K. Massive haemoperitoneum due to uterine artery erosion by endometriosis and a review of the literature. *Gynecol Surg* 5, 133–135 (2008). https://doi.org/10.1007/s10397-007-0331-4

[7] Saei Ghare Naz M, Rostami Dovom M, Ramezani Tehrani F. The Menstrual Disturbances in Endocrine Disorders: A Narrative Review. Int J Endocrinol Metab. 2020 Oct 14;18(4): e106694. doi: 10.5812/ijem.106694. PMID: 33613678; PMCID: PMC7887462.

[8] Soni S, Menon MC, Bhaskaran M, Jhaveri KD, Molmenti E, Muoio V. Elevated human chorionic gonadotropin levels in patients with chronic kidney disease: Case series and review of literature. Indian J Nephrol. 2013 Nov;23(6):424-7. doi: 10.4103/0971-4065.120339. PMID: 24339520; PMCID: PMC3841510.

[9] Anitha MB et al. Int Surg J. 2021 Apr;8(4):1334-1336 http://www.ijsurgery.com. Massive spontaneous hemoperitoneum: known cause from an unknown site DOI: https://dx.doi.org/10.18203/2349-2902.isj20211319

[10] Joshi KS, Acharya NS, Acharya S, Joshi SV. Massive haemoperitoneum postovulation: a rare complication of unmonitored anticoagulant therapy. J Clin Diagn Res. 2022, 16 https://doi.org/10.7860/JCDR/2022/50491.16046

[11] Espil, G., Larranaga, N., Villarroel, N., Oyarzun, A., Matzke, G. and Kozima, S., 2015. Spontaneous abdominal hemorrhage: imaging evaluation. *Rev Argent Radiol*, *79*(2), pp.86-94. URL: https://www.researchgate.net/publication/327824557_Spontaneous_abdominal_hemorrhage_imaging_evaluation

[12] Furlan A, Fakhran S, Federle MP. Spontaneous abdominal hemorrhage: causes, CT findings, and clinical implications. AJR Am J Roentgenol. 2009 Oct;193(4):1077-87. doi: 10.2214/AJR.08.2231. PMID: 19770332.

[13] Kamthornthanakarn I, Krittayaphong R. Optimal INR level for warfarin therapy after mechanical mitral valve replacement. BMC Cardiovasc Disord. 2019 Apr 25;19(1):97. doi: 10.1186/s12872-019-1078-3. PMID: 31023235; PMCID: PMC6482495.

[14] Marco F, Valli G et al. Management of bleeding in patients on direct oral anticoagulants in emergency department: where we are and where we are going. Eur Heart J Suppl. 2023 Apr 26;25(Suppl C): C15- C19. PMID: 37125272; PMCID: PMC10132614. https://doi.org/10.1093/eurheartjsupp/suad004.

[15] Tomaselli, G, Mahaffey, K, Cuker, A. et al. 2020 ACC Expert Consensus. Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants: A Report of the American College of Cardiology Solution Set Oversight Committee. JACC. 2020 Aug, 76 (5) 594–622. https://doi.org/10.1016/j.jacc.2020.04.053.

[16] Hörer, Tal & Ierardi, Anna & Carriero, Serena & Lanza, Carolina & Carrafiello, Gianpaolo & McGreevy, David. (2023). Emergent vessel embolization for major traumatic and non-traumatic hemorrhage: Indications, tools and outcomes. Seminars in Vascular Surgery. 36. 10.1053/j.semvascsurg.2023.04.011.

[17] Ghasemian Dizaj Mehr, S., Bahadori, R. Successful Conservative Management of Massive Hemoperitoneum in Patients on Anticoagulation with Ruptured Hemorrhagic Ovarian Cyst: A Report of Two Cases and Review of Literature. J Obstet Gynecol Cancer Res. 2024;9(2):231-4. https://doi.org/10.30699/jogcr.9.2.231