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Ovarian vein and inferior vena cava thrombosis after vaginal delivery: A case report

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ABSTRACT

Ovarian vein thrombosis (OVT) is a rare but serious complication, most commonly occurring in the postpartum period. This article reports the case of a 40-year-old woman who presented 12 days after a normal vaginal delivery with fever and pelvic pain. An initial diagnosis of endometritis was made, and empiric antibiotic therapy was administered, but the fever persisted. An ultrasound scan was then done to rule out appendicitis, which revealed a thrombosis of the right ovarian vein extended to the inferior vena cava. Appropriate anticoagulant therapy was immediately started with spectacular clinical improvement.

Ovarian vein thrombosis is difficult to diagnose as the signs are nonspecific, like fever and pelvic pain; radiological exploration, typically doppler ultrasound and computerized tomography, are therefore required. Early treatment is crucial to prevent severe complications, especially pulmonary embolism. This case emphasizes the need for heightened clinical awareness and a multidisciplinary approach to achieve optimal outcomes in managing ovarian vein thrombosis.

1. Introduction

Ovarian vein thrombosis (OVT) is a rare and potentially life-threatening complication, most commonly observed in the postpartum period but also associated with pelvic inflammatory diseases, gynecological or abdominal surgeries, fibroids, hormonal stimulation, and cancer [1]. It affects the right ovarian vein in 90% of cases, and extends to the inferior vena cava (IVC) in approximately 20%. Clinical suspicion arises from persistent fever and pelvic pain, with confirmation typically achieved through doppler ultrasound and contrast computerized tomography (CT). Adequate treatment with anticoagulants and antibiotics is crucial to prevent severe complications such as sepsis and pulmonary embolism [2].

This is a case report of right ovarian vein and inferior vena cava thrombosis diagnosed after vaginal delivery. The aims of this report are to highlight the diagnostic challenges posed by this condition's nonspecific clinical presentation and to emphasize the necessity of a collaborative approach involving obstetricians, anesthesiologists and radiologists.

2. Case Presentation

The 40-year-old patient (gravida 4, para 4, all vaginal deliveries) presented at 12 days postpartum with pelvic pain, palpitations, and pollakiuria. She was being treated (with iron injections) for iron-deficiency anemia; her body mass index was 28 kg/m^2. The last delivery occurred smoothly at 39 weeks with the assistance of a vacuum extractor; she gave birth to a male infant weighing 3000 g, with Apgar scores of 10/10.

Pelvic examination revealed no purulent lochia, but painful uterine palpation. She had a fever (38,7 °C) and a heart rate of 120 beats/min.

Biological tests revealed a significant inflammatory syndrome with elevated WBC and CRP but a sterile urine culture. An initial diagnosis of postpartum endometritis was made, and the patient was placed on empirical antibiotic therapy. The clinical course was marked by worsening pelvic pain, particularly on the right side, and nausea with a persistent fever reaching 39 °C. Given this clinical picture, an abdominopelvic ultrasound was ordered to rule out appendicitis.

On ultrasound, the right ovarian vein was dilated, reaching 34.2 mm in diameter (Fig. 1.A), with heterogeneous echogenic thrombotic

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endoluminal material along its entire course (Fig. 1.B), extending to the inferior vena cava (IVC) at its junction over 27 mm (Fig. 1.C). The uterus showed signs of hematometra, consistent with the postpartum context (Fig. 1.D). The appendix was normal.

The patient was started on 3 g a day of amoxicillin-clavulanic acid and 1 mg/kg every 12 h of enoxaparin with great clinical and biological improvement. Apyrexia was achieved after 48 h, and the pain resolved within the week. She was then put on warfarin for 3 months, after which follow-up ultrasound showed the complete dissolution of the thrombus.

3. Discussion

Ovarian vein thrombosis (OVT) is a rare type of deep-vein thrombosis, 60 times less frequent than lower-limb-vein thrombosis [3]. As a complication of the postpartum period, it occurs in approximately 0.01–0.18% of all pregnancies but is 10 times higher after Cesarean section than vaginal delivery. It is more common in multiparous women [4].

The ovarian veins originate from the ovarian, tubal, uterine, ureteral, and parietal plexuses. They drain into the inferior vena cava on the right and into the left renal vein on the left. Due to the length and tortuosity of the right ovarian vein, as well as the often incompetent valves, ovarian vein thromboses (OVT) occur in 80%- 90% of cases on the right side [2]. This preference for right-sided thromboses is further explained by the dextrorotation of the gravid uterus during pregnancy [1].

The pathophysiological processes leading to OVT is believed to be similar to other forms of phlebitis and relies on the triad of Virchow: stasis, hypercoagulability and vessel damage. Firstly, during pregnancy, the diameter of the ovarian vein, typically 3–4 mm, is multiplied by 3, leading to increased stasis and valve incompetence. Secondly, a state of hypercoagulability associated with elevated production of pro-coagulant factors inherent to pregnancy persists for up to six weeks postpartum. Lastly, cesarean section or instrumental delivery can result in vessel wall trauma, as well as indirect trauma via *endo*-uterine infection. Indeed, ovarian vein thrombosis can coexist with postpartum endometritis in 60% of cases [5].

The diagnosis of OVT is challenging, and often delayed due to nonspecific and misleading clinical presentations. In the postpartum period, it is most frequently discovered during the first week and up to the fourth week [6]. The primary symptom is unilateral pelvic pain accompanied by fever, often exceeding 39 °C, observed in approximately 80% of cases [5]. However, due to the vascular anastomotic networks, manifestations can include digestive symptoms such as nausea, vomiting, ileus, tenesmus, as well as urinary symptoms like pollakiuria [4]. OVT can also manifest initially as a complication, notably septic pelvic thrombophlebitis and pulmonary embolism [6]. The main differential diagnosis is endometritis but the presentation may also mimic appendicitis, pyelonephritis, and adnexal torsion, occasionally presenting as acute abdomen with signs of peritoneal irritation [7]. The findings on clinical examination are often limited. A lateral uterine mass may be palpable, along with a painful varicose cord within the vagina [5].

Biological tests usually show a nonspecific inflammatory syndrome with hyperleukocytosis and elevated CRP. Bacterial tests like vaginal swab are often positive, highlighting the suppurative nature of the thrombosis [5]. D-dimere dosage has poor diagnostic value during pregnancy and peripartum, but an elevated dosage beyond 500 ng/ml at four weeks postpartum is indicative of a possible thrombosis [8].

Radiological diagnosis relies on doppler ultrasound as an initial screening test. It may detect the thrombus as an heterogenous echogenic endoluminal mass. Indirect signs are an enlarged, incompressible ovarian vein with a reduced or absent flow [7,8]. Nonetheless, ultrasound has only a 55% sensitivity, limited by the operator's expertise and the bowel gas interference [6]. Hence the necessity for contrast CT scan, which has a sensitivity of 100% and a specificity of 99% for detecting OVT [7]. It reveals the presence of an enlarged thrombosed ovarian vein, as well as vessel wall enhancement and intraluminal hyperdensity or hypodensity, depending on the age of the thrombus [5]. It may also

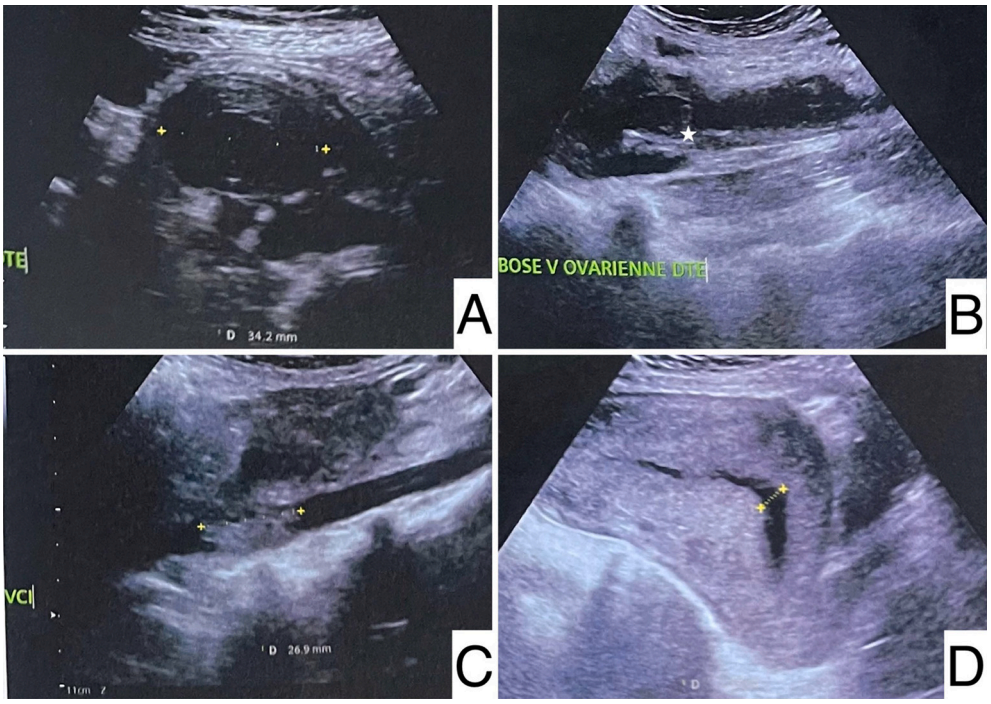

Fig. 1. Ultrasound images of right ovarian vein and IVC thrombosis.
A: Dilated right ovarian vein measuring 34.2 mm.
B: Thrombus along the entire course of the right ovarian vein (white star).
C: Thrombus of the IVC measuring 27 mm.
D: Hematometra.

detect its extension into the IVC in 15% of cases and the renal vein in 12% [7,8].

Magnetic resonance imaging (MRI) has a similar specificity and sensitivity to CT but is better in determining the age of the thrombus (due to the ferromagnetic properties of hemoglobin) [5,9]. However, it is costly and often inaccessible in the context of emergency.

Medical treatment of OVT relies on curative-dose anticoagulants and antibiotics. Low-molecular-weight heparin (LMWH) followed by warfarin is most commonly used and is preferable to unfractionated heparin [8]. Oral anticoagulants may be used as well, but their efficiency in rare thromboses has not yet been proved [6]. There are no guidelines on the length of anticoagulation therapy, but, by analogy to other sites of thrombosis, 3 months appears to be the most consensual duration [8]. Some authors suggest repeating imaging after 40 to 60 days to ensure the complete resolution of the thrombus before stopping treatment [9]. Broad-spectrum antibiotics are necessary in case of fever; they are typically administered for 1 to 3 weeks [5]. Other therapeutic options include interventional methods like thrombectomy and IVC filter as well as surgical vein ligation. They are indicated in case of poor compliance, recurrent pulmonary embolism, and contraindication to anticoagulants [10].

The prognosis of OVT is generally favorable with well-conducted treatment, leading to the regression of fever and pelvic pain by the third day [5]. Complications can occur due to delayed diagnosis, including sepsis in the absence of adequate antibiotic therapy, thrombosis extension to the renal veins (12%) and the IVC (15%), along with a 25% risk of pulmonary embolism resulting in a mortality rate of 4% [8,11].

The recurrence rate during subsequent pregnancies and the postpartum period appears to be lower compared to other thrombosis sites. No prevention is recommended for future pregnancies or the postpartum period unless associated with thromboembolic risk factors [8]. Thrombophilia testing may be considered to investigate the cause of OVT, particularly for postpartum events, and to support preventive measures in case of anomalies [5].

4. Conclusion

Ovarian thrombosis represents a rare yet potentially fatal etiology of pelvic pain during the postpartum period. Its diagnosis is frequently delayed due to nonspecific clinical presentations, necessitating reliance on radiological examinations. Early initiation of combined anticoagulant and antibiotic therapy is paramount to avoid complications such as sepsis and pulmonary embolism. Despite the severity of the condition, the outcome is usually favorable, although recurrence is possible, particularly in the presence of persistent prothrombotic risk factors.

Contributors

Hounaida Mahfoud contributed to patient care, conception of the case report, acquiring and interpreting the data, undertaking the literature review and drafting the manuscript.

Amina Etber contributed to the conception of the case report, acquiring and interpreting the data and and revising the article critically for important intellectual content.

Khadija Errmili contributed to patient care, drafting the manuscript, undertaking the literature review.

Saad Khairoun contributed to patient care, drafting the manuscript and acquiring and interpreting the data.

Najia Zeraidi contributed to undertaking the literature review and revising the article critically for important intellectual content.

Aziz Baidada contributed to undertaking the literature review and revising the article critically for important intellectual content.

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Patient consent

Consent was obtained from the patient to publish the clinical details and the images included.

Provenance and peer review

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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