



Case report

Ovarian vein and IVC thrombosis due to normal vaginal delivery; a case report and literature review

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ABSTRACT

Introduction and importance: Ovarian vein thrombosis (OVT) is exceedingly rare, which commonly occurs in postpartum patients and can result in serious complication such as pulmonary emboli. With a presentation often mimicking that of acute abdomen, it can be often misdiagnosed and mistreated.

Case presentation: A 30-year-old woman referred with right lower quadrant abdominal pain, nausea and anorexia, one week after normal vaginal delivery. Physical examination demonstrated tenderness and rebound tenderness at the right side of the abdomen, with a stable vital sign except 38 °C fever. She had no history of coagulation problems or thrombotic disorders. Patient was admitted on a suspicion of appendicitis and was prescribed antibiotics followed by pelvic and abdominal ultrasonography that indicated an 8 to 10-centimeter hypoechoic tubular structure on the right side, next to the IVC. CT scan with contrast showed clear dilatation and thrombosis of the right ovarian vein with spread to the IVC. Anticoagulant treatment was started with 1000 intravenous units of heparin per hour, along with aPTT control, with a disappearance of the symptoms after 72 h.

Conclusion: Suspicion of OVT should be high in cases where patients refer with abdominal pain after childbirth, this diagnosis should be taken into account. In the absence of proper and timely diagnosis, it may lead to serious complications or mortality of the mother. CT scan with contrast and at least 3- months anticoagulant therapy (in case of thrombosis spreading to the IVC, this period should be extended) is recommended in diagnosing and treatment of OVT.

1. Introduction

Ovarian blood is drained into the inferior vena cava (IVC) and left renal veins through the right and left ovarian veins, respectively. Ovarian vein thrombosis (OVT) is, in fact, a sort of deep vein thrombosis (DVT) that has several causes and could threaten the patient's life. The causes of this complication are divided into two categories of pregnancy-related and non-pregnancy-related causes (infections, pelvic surgeries, malignancies, and coagulation disorders). [1,2]

Cases with pregnancy-related causes often become clinically symptomatic a week after delivery. Such cases are clinically ill and refer with complaints about fever and flank or back pains that sometimes mimic acute abdominal symptoms such as pyelonephritis, appendicitis, or ovarian torsion or abscess specifically on the right side.

The prevalence of the aforementioned, varies across different studies

but has been reported to be between 0.05 and 0.2% of total pregnancies and 1–2% of caesarean sections in most cases [1,2,5]. The right ovarian vein is more likely to be involved compared to the left ovarian vein (80% vs. 6%) and both veins are involved in 14% of the cases. [9]

Serious complications such as pulmonary embolism –which is associated with high mortality and morbidity- might arise in case the thrombosis spreads into the IVC, that is why early diagnosis and accurate and timely treatment are imperative.

The present study is a case report on right ovarian vein thrombosis with spread to the IVC following labour. It also discusses various case reports and articles to review diagnosis, treatment, and follow-up methods. This work has been reported in line with the SCARE criteria [11].

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2. Case presentation

The patient is a 30-year-old woman who referred with right lower quadrant (RLQ) abdominal pain, one week after the normal delivery of a male infant weighing 3100 g and with an Apgar score of 9/10.

She suffered from nausea and anorexia but no vomiting. The patient's vital signs were stable and had a 38 °C fever. Tenderness and rebound tenderness were observed in the abdominal examination, especially on the right side of the RLQ area. Vaginal and pelvic examinations indicated no inflammation or infection.

No history of coagulation problems or thrombotic disorders were mentioned in the medical records of the patient or her first-degree relatives. The patient had no abnormal bleeding after the labour and had not transfused blood over the recent years. She has not taken any special medicine and has no history of oral contraceptive pill (OCP) use either. There is no history of any genetic disorder in the patient and first-degree relatives. Also, she has gone through the pregnancy without any significant problems.

CBC test indicated: WBC 11000, Haemoglobin 11 and 310,000 platelets. The patient had not undergone a fibrinogen test and her D-dimer results were higher than normal. LDH was 380, serum electrolytes and biochemistry were reported to be normal. The patient was examined vaginally by a gynaecologist and had no symptoms suggestive of pelvic inflammation or endometriosis.

The patient was admitted with a possible appendicitis diagnosis and was prescribed antibiotics followed by pelvic and abdominal ultrasonography that indicated an 8 to 10-cm hypoechoic tubular structure on the right side, next to the IVC.

A CT scan with pelvic and abdominal venous contrast was performed for better diagnosis, which demonstrated a clear dilatation and thrombosis of the right ovarian vein with spread to the IVC (Fig. 1).

The patient was diagnosed with symptomatic right ovarian vein thrombosis with spread to the IVC and therefore was admitted to the vascular surgery unit. Subsequently, an anticoagulant treatment was

started with 1000 intravenous units of heparin per hour, along with aPTT control.

The patient was also receiving ceftriaxone and metronidazole antibiotics. No interventional measures were taken for the patient given that her condition improved and the symptoms disappeared after 72 h, and the fact that she did not give consent for IVC filter placement.

The patient started receiving warfarin since the third day and heparin was discontinued as soon as the patient's INR reached above 2. The patient was discharged in a good general condition after six days of hospitalization and was advised to take a 5 mg daily dose of warfarin for a minimum of three months. The patient indicated no symptoms or complications over regular follow-ups. Fortunately, the thrombus inside the IVC disappeared and the right ovarian vein was recanalized.

3. Discussions

Similar to other cases of deep vein thrombosis, OVT occurs due to Virchow's triad (intimal damage, hypercoagulable state, and venous stasis). C-section increases the risk of ovarian vein thrombosis compared to normal vaginal delivery since the veins dilate and contain a low blood flow throughout pregnancy, specifically during anaesthesia. Higher tissue trauma and bed rest following a C-section could justify the higher prevalence of ovarian vein thrombosis following caesarean section compared to normal vaginal delivery [1]. In our case, the possibility of the situation being due to atherosclerosis was low given that the patient's test results indicated no issues—for instance, triglycerides and LDL were normal—and there was no history of thrombotic disorders in her, or her family.

Typical symptoms incorporate fever, abdominal and pelvic pain and discernible abdominal mass. In addition to pregnancy and childbirth, ovarian thrombosis may be associated with diseases such as pelvic inflammation, gynaecologic malignancies or pelvic surgeries and coagulation disorders. Idiopathic cases are very uncommon [2]. Right ovarian thrombosis can regularly mimic the symptoms of acute

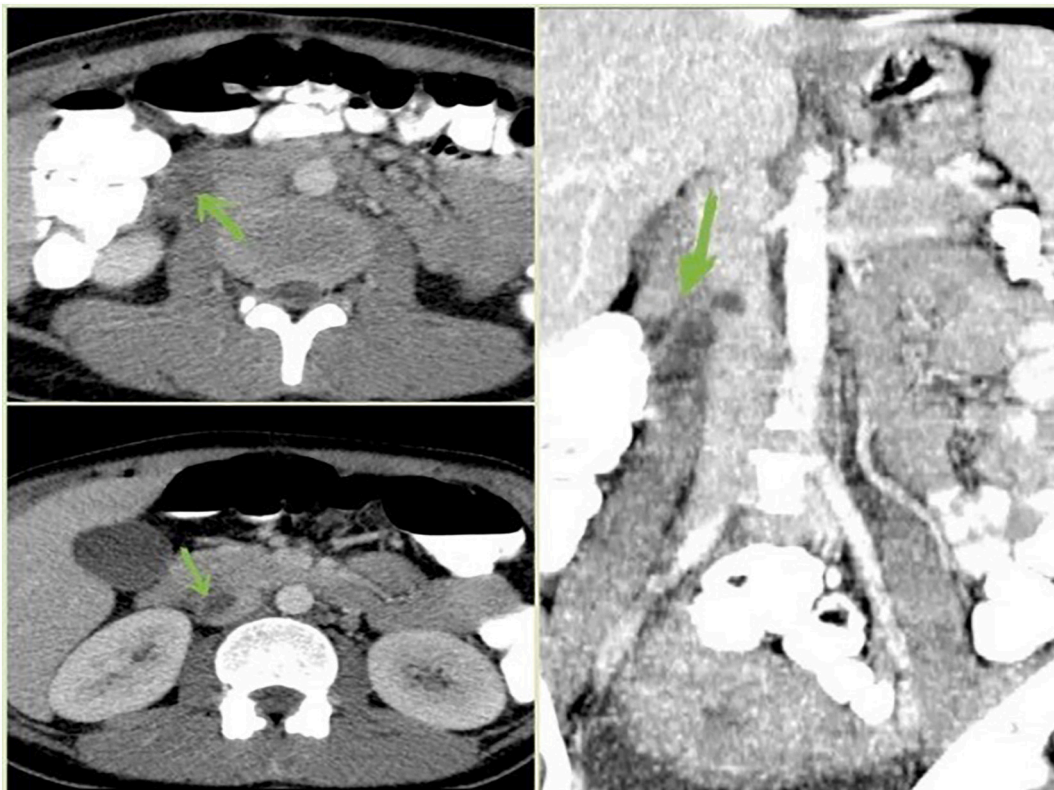


Fig. 1. CT scan showing clear dilatation and thrombosis of the right ovarian vein with spread to IVC (green arrows).

abdomen. In this case, anti-microbial treatment starts with acute abdomen and ruptured appendix diagnosis. Subsequently, OVT ought to be considered in patients presenting with postpartum abdominal pain.

Kodali et al. reported a case of a 40-year-old woman referring to the emergency room with abdominal pain, no medical condition, no OCP use, and only a history of bilateral tubal ligation surgery and endometrial ablation five years ago. All tests and coagulation factors were normal. CT scan was performed to R/O a ruptured appendix. Normal appendix and right ovarian thrombosis without hematoma were seen. Anticoagulants were given for 6 months and a CT scan was performed after 3 months of discharge. Their view is that, CT scan has a high sensitivity and specificity in diagnosing ovarian vein thrombosis and is more cost-effective compared to MRI. [2]

Bethany T et al. reported a 26-year-old female patient referring with right abdominal pain, persistent fever and chills three days after caesarean section, whose CT scan results indicated right ovarian vein enlargement and thrombosis. They conducted a systematic review of the management of such a case and have suggested that OVT imaging is dependent on its availability. Still, MRI appears to be more specific and sensitive compared to other imaging methods. In terms of ovarian vein thrombosis treatment and management, they have indicated that anticoagulant prescription is not recommended in asymptomatic cases that have not spread, while it is recommended for three months in symptomatic cases and for a while longer in case of thrombosis spread or embolism. [3]

Charles J Lenz et al. in one retrospective study, compared patients who had ovarian vein thrombosis during 25 years from 1990 to 2015 with those with leg DVT in terms of complications such as pulmonary embolism as well as their etiology. In 6% of people who had OVT and 16% of people who had leg DVT, pulmonary embolism was the initial presentation and most causes included cancer, hormonal stimulation, surgery and hospitalization. The prevalence of OVT was 60 times lower than that of leg DVT. [4]

Signe Ostergard et al. reported two patients. The first, a 32-year-old woman who referred with abdominal pain on the fourth day after vaginal delivery. During childbirth, she received 2-units of packed cell due to severe bleeding. Antibiotics were started due to high CRP and leucocytosis, with a suspicion of Endometritis. However, residual symptoms and a CT scan performed showed ovarian vein thrombosis and she received anticoagulants for 3 months. In the second case, a 35-year-old with twin pregnancy was admitted with abdominal pain on the eighth day after caesarean section. Although the patient had received heparin prophylaxis, she had bilateral ovarian thrombosis on CT scan. In their opinion, twin pregnancy is one of the most important risk factors of OVT. [5]

João Abrantes et al. reported a 34-year-old multiparous woman, hospitalized 72 h after giving birth with acute right abdominal pain, mild leucocytosis and positive D-dimer. On CT scan, she had a right OVT that was resolved with broad-spectrum antibiotics and anti-coagulants within 48 h. On control CT scan, she had a duplicated right ovarian vein. Vascular anomalies can also play a role in postpartum thrombosis. [6]

Simon Mantha et al. conducted a retrospective study and examined patients who had undergone ovarian cancer surgery from 2001 to 2010 and it included those who had had CT scan before and after surgery. OVT usually occurs after ovarian cancer surgery and there is no need for anticoagulant use in asymptomatic cases. The spread of thrombosis rarely occurs clinically. It is also not recommended to repeat CT scans, except for venous thromboembolism symptoms. [7]

A case report of normal postpartum ovarian vein thrombosis in a 35-year-old woman, eight days after uncomplicated twin delivery in the form of a normal vaginal delivery (NVD), was reported by Sidra Khaled et al. For her, treatment with enoxaparin and antibiotics was begun, considering that the patient was breastfeeding, rivaroxaban was not started. Given that warfarin required repeated laboratory tests, the patient discontinued its use. Therefore, Enoxaparin was prescribed for 3

months. Six months later, a CT scan was performed which showed recovery of IVC thrombosis. [8]

Amihai Rottenstreich et al. collected clinical, laboratory and radiological demographic characteristics of patients with ovarian vein thrombosis and evaluated their management and follow-up as a retrospective and multicentre study. On 40-months follow-up, only one relapse was observed and no deaths reported, the average intake of anticoagulants in cases unrelated to pregnancy was longer than pregnancy-related cases. They noted that in pregnancy-related OVT, recovery rates are higher in the short term, and 3-month anticoagulant treatment seems safe and sufficient. In cases unrelated to pregnancy, thrombophilia seems to play an important role in OVT, so in these cases, it should be checked. [9]

Harun Arslan et al. also, reported OVT after an elective caesarean section, which was referred on the seventh day after delivery. The thrombosis had also spread to the IVC, a condition which anticoagulant treatment improved and did not require any interventional measure. Most of the time, ultrasound is helpful but to confirm diagnosis and the possibility of spreading of clot to IVC, CT scan needs to be done. [10]

According to the above cases, OVT is rare after a natural childbirth and it is mostly seen after caesarean section especially if it extends to IVC. That's why we report this case to get acquainted with different etiologies and treatment. For diagnosis of suspected cases LDH and D-Dimer tests are helpful, as well as imaging studies such as ultrasound, CT scan and MRI are recommended although CT scan is the preferred method for diagnosis due to its high accuracy and availability. Routine treatment in these patients includes anticoagulants and in case of fever and leucocytosis, antibiotics are also recommended. Of course, in asymptomatic cases there is no need for treatment but in symptomatic cases, proper and timely treatment should be done.

In relation to the cases discussed, diagnosis with ultrasound and CT scan with contrast was proved and treatment of ovarian vein thrombosis was started as a combination of antibiotics and anticoagulants. OVT can be very fatal and cause many serious complications, so in situations that spread to IVC, IVC filters and other preventive measures may be needed to prevent pulmonary embolism and other fatal complications.

In this case, we also recommended that an IVC filter be inserted, but unfortunately the patient did not accept. She only received anticoagulants and recovered without further need for filter and with no serious complications such as pulmonary emboli.

4. Conclusion

Ovarian vein thrombosis following childbirth especially after normal vaginal delivery is rare and, in many cases, may mimic acute abdominal symptoms. Therefore, in cases where patients refer with abdominal pain after childbirth, this diagnosis should be taken into account. In the absence of proper and timely diagnosis, it may lead to serious complications or mortality of the mother.

LDH and D-dimer level are helpful in diagnosing this disease, as well as imaging methods such as ultrasound, CT scan and MRI are all useful. For accurate diagnosis, CT scan, considering the fact that it is present in most centres, is the preferred method.

There is no indication for the treatment of asymptomatic cases. For treatment of symptomatic cases, at least 3-months anticoagulant therapy is recommended and in case of thrombosis spreading to the IVC, this period should be extended.

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

H. Zabihi Mahmoudabadi and K. Najjari made substantial contributions to the conception, writing, design of the manuscript and gave approval for the manuscript to be published. E. Oklah assisted in assimilation of all information, edited and revised the manuscript critically for intellectual content. F. Kor was the surgeon of the patient: managed the patient and also made substantial contribution to the conception and design; and revising the manuscript critically for important intellectual content; and gave final approval of the version to be published.

Research registration

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Guarantors

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Declaration of competing interest

None declared.

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