

# Ovarian Vein Thrombosis Presenting as Acute Abdomen in Puerperium

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## ABSTRACT

Postpartum Ovarian Vein Thrombosis (POVT) is a rare, but serious condition that causes slow quadrant pain in the postpartum period. POVT must be considered in the differential diagnosis of postpartum acute abdomen. We hereby report a case on a 36-year-old Italian woman who developed an acute abdomen a week after spontaneous vaginal delivery. She had persistent fever and constipation. Diagnosis of POVT was made with an abdominal Computed Tomography (CT) and treatment with heparin and broad-spectrum antibiotics were started. After 72 hours, the patient was switched from low molecular weight heparin to oral anticoagulant treatment. After 5 months a complete recanalization was demonstrated by abdomen CT and the treatment was stopped 6 months after diagnosis. POVT is a diagnosis of exclusion in the puerperium. This case illustrated that POVT may also occur in low risk patient.

**Keywords:** Deep vein thrombosis, Postpartum, Right ovarian vein

## CASE REPORT

A 36-year-old Italian woman, G3P1, presented to our tertiary care center with abdominal pain 7 days after uncomplicated vaginal delivery. She had lower right abdominal and epigastric pain. Although patient has not opened her bowel for three days, there was neither nausea nor vomit. She reported exacerbation of pain following a successful enema.

Patient's BMI was 26.2 and she was a non-smoker. Her family history was negative for both cardiovascular diseases and thrombotic disorders. Medical history included two spontaneous miscarriages in the last two years, a non-specific gastritis, and a 4x5 cm subserosal leiomyoma. After the second miscarriage, she had been tested for inherited and acquired thrombophilia and all tests resulted negative. Then, she had a singleton uneventful pregnancy. At 39+3 weeks she had spontaneous vaginal delivery. First and second stages lasted 4 hours. Placenta was expelled spontaneously after 30 minutes. She was discharged after 3 days.

At the time of admission, clinical examination showed intense pain in the right iliac fossa with positive Blumberg sign. Her temperature was 37.5°C and bowel movements were normal.

She had persistent fever since two days after the delivery. Vaginal examination was hampered by severe pain, especially during womb mobilization. Transvaginal and transabdominal ultrasounds showed regular puerperal uterus. Adnexa were not visualized. Vital signs were normal except for fever. Blood test showed no leukocytosis, normal haemoglobin level, normal red cells count, normal C reactive protein and a normal coagulation set. A Computed Tomography (CT) with intravenous contrast injection was performed and led us the correct diagnosis of postpartum right ovarian vein thrombosis (POVT). The CT showed thrombosis of the whole right ovarian vein up to the junction with inferior cava vein [Table/Fig-1]. An antithrombotic therapy was started with intravenous heparin (15000 UI/die). After 24 hours, the patient was switched to Low Molecular Weight Heparin (LMWH) (6000 UI twice a day) and also broad-spectrum antibiotics were started (ceftriaxone 2 g IV every 12 hours and metronidazole 500 mg IV every 8 hours). After 72 hours of LMWH therapy, oral anticoagulant treatment was added by monitoring International



**[Table/Fig-1]:** a) CT coronal shows an enlarged ovarian vein with central hypodensity, representing thrombosis (red arrows). b) CT axial demonstrates enlarged ovarian vein, inflamed perivascular area, and thrombus in ovarian vein (red arrows).

Normalized Ratio (INR). The goal international normalized ratio (INR) was 2 to 3. Hospital stay was regular, after 12 hours of treatment, temperature was normal and patient was discharged two days later. Antithrombotic therapy was continued with LMWH plus oral anticoagulant treatment till ambulatory monitoring after 7 days, then with only oral anticoagulant treatment. Antibiotics were suspended after a week. After 5 months a complete recanalization was demonstrated by abdomen CT and the treatment was stopped 6 months after diagnosis.

## DISCUSSION

POVT refers to an intraluminal thrombus occurring anywhere in the ovarian vein in a woman after she has given birth. It is a rare complication of pregnancy and delivery, being its incidence between 0.002% and 0.05% [1]. It should be considered in patients with right fossa pain, lower quadrant tenderness and persistent fever [2].

POVT can lead to serious potentially life-threatening complications such as sepsis and pulmonary embolism. Hypercoagulable state, venous stasis and endothelial injury (Virchow's triad) are the most common underlying causes of POVT [3]. Pregnancy is an example of Virchow's triad. Firstly, in pregnancy uterus increases in size with increased blood flow and increased pelvic and lower limbs vein stasis; these vascular changes remain for up to 72 hours after delivery. Secondly, during pregnancy and puerperium period there is a hypercoagulable state. Finally, gravid women may have

endothelial trauma during delivery or from local inflammation. As a result, women are five times more likely to develop deep vein thrombosis (DVT) during pregnancy than when they are not pregnant [3].

POVT represents less than 5% of all causes of DVT [4]. Risk factors for POVT are cesarean delivery, multiparity, smoking history, obesity, puerperal bacteraemia and both inherited and acquired thrombophilia. Given these risk factors, also anaerobic bacteria may contribute to POVT, as they could be able to generate an endothelial injury [4]. Anaerobic bacteria are commonly in the lower genital tract and may reach ovarian veins by crossing the uterine and vaginal veins. In literature, there are several case reports and case series on POVT [1-4] and most of the cases occurred in women with at least one risk factor. Interestingly, our patient had an uneventful vaginal delivery and she was a non-smoker with a negative thrombophilia screening, therefore she was a low risk patient for POVT. Indeed, among low-risk postpartum patients, there is a high prevalence of definite pelvic vein intraluminal filling defects. A prospective study published in 2012 assessed the incidence of pelvic vein thrombosis in low risk patients using magnetic resonance venography [5]. Almost a third of the participants had thrombosis of the iliac and ovarian veins. All the patients were asymptomatic and received no treatments.

POVT is a bilateral condition in 11-14% of cases [1]. Right vein is involved in 70-90% of cases; probably, this is due to the longer length of the right vein and to a higher risk of compression during dextrorotation of the gravid uterus.

Symptoms of POVT include pelvic pain, flank pain, chest pain, fever, tachycardia, leukocytosis and pelvic palpable mass for up to 15 days after delivery [1-4]. The diagnosis often is highly challenging as there are several differential diagnosis of POVT as acute appendicitis, intestinal volvulus, broad-ligament haematoma, adnexal torsion, pelvic abscess, pyelonephritis, retroperitoneal lymphadenopathy, puerperal endometritis [1-4]. Our patient presented with an acute abdomen and persistent fever. Laboratory tests showed no leukocytosis, normal haemoglobin level, and the patient had an abnormal bowel pattern.

Furthermore, the best approach to diagnose once clinical suspicion is raised has not been definitively established. Ultrasounds, Magnetic Resonance Imaging (MRI), computerized tomography (CT) can help for a correct diagnosis with a sensitivity of 52%, 92%, and 100% respectively [1,2]. Colour Doppler Ultrasounds (CDUS) represents the primary imaging tool for DVT, because of its availability, rapidity of execution and low cost, although its sensibility is low. Indeed, during the postpartum period, especially after a cesarean section, there is often bowel distension and an enlarged puerperal uterus, hampering the execution of CDUS [6]. Helical CT angiography study and conventional venography are considered the standard methods for diagnosis of POVT. However, according

to a recent study, CT and MRI Imaging are equally sensitive for detecting POVT and more feasible. Particularly, in MRI, DWI sequence is very helpful for POVT diagnosis. Moreover the use of DWI may obviate the administration of intravenous contrast on MRI [7]. In our patient, diagnosis was established with abdomen CT, while transvaginal and transabdominal ultrasounds were negative. We preferred CT to MRI as MRI was not our institution available in our institution.

Concerning the treatment of POVT, most authors suggest LMWH but there is no consensus about the type, dose or duration of treatment [1-4]. Broad-spectrum antibiotics are also commonly used. Endovascular or surgical procedure like thrombectomy, cava filters, ovarian vein ligation may be used in case of high risk of pulmonary embolism. Secondary prevention is based on use of Low Molecular Weight Heparin (LMWH) after delivery in patients with risk factors [1,2,4].

## CONCLUSION

Postpartum ovarian vein thrombosis is an uncommon complication of the postpartum period. As all DVTs, POVT may potentially cause life-threatening complications, such as sepsis and pulmonary embolism. Although there are known risks factor, POVT may occur also in low risk patients.

A prompt diagnosis and treatment is mandatory. After a clinical suspicion has been raised, diagnosis is non-invasive and it is based on imaging. Medical treatment with LMWH and broad-spectrum antibiotics is effective in cases without pulmonary embolism or without involvement of the inferior cava vein. Endovascular or surgical treatments are indicated in complicated cases or when high risk of pulmonary embolism is present.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Nov 18, 2015**  
Date of Peer Review: **Dec 19, 2015**  
Date of Acceptance: **Jan 08, 2016**  
Date of Publishing: **Feb 01, 2016**