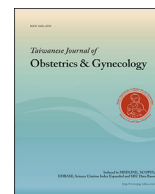




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## Case Report

# Diagnosis and management of ovarian vein thrombosis after laparoscopic -assisted vaginal hysterectomy with bilateral salpingectomy: A case report and literature review

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## ABSTRACT

**Objective:** We present a case who developed ovarian vein thrombosis (OVT) after laparoscopic-assisted vaginal hysterectomy with bilateral salpingectomy to share our experience.

**Case report:** A 46-year-old woman came to our hospital due to severe dysmenorrhea induced by adenomyosis. Medical treatments were given but with unsatisfactory effect. As the patient had completed family planning, a hysterectomy was scheduled. However, on the sixth postoperative day, the patient complained of low abdominal pain with fever on and off. After a series of examinations, right OVT was diagnosed. The patient was treated with antibiotics only. Under close surveillance, the OVT resolved spontaneously, and the patient was discharged.

**Conclusion:** Diagnosis of OVT requires highly suspicion owing to its rarity and non-specific presentation. OVT is a potentially serious venous thromboembolism that sometimes can be life threatening. Anticoagulant treatment is still controversial. Conventional Tomography with contrast medium could detect early OVT with high sensitivity and specificity.

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## Introduction

Ovarian vein thrombosis (OVT) is a rare condition that happened during pregnancy, postpartum period, and gynecological malignancy or after abdominal and pelvic surgery [1]. Owing to its longer length and multiple incompetent valves, the right ovarian vein is a common site of OVT occurrence. The optimal treatment of OVT is still under debate. Previous reports have indicated there was no statistically significant difference in the clinical outcome between treatment with or without anticoagulant in patients diagnosed with OVT.

Here we present a case that had no significant past medical history but developed OVT after laparoscopic-assisted vaginal hysterectomy to share our experience.

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## Case presentation

A 46-year-old woman, gravida 3, para 3 came to our hospital for management of prolonged menstrual bleeding and severe dysmenorrhea. Her BMI was 23.8 kg/m<sup>2</sup> and she never received any operation before. Laboratory data revealed a decreased hemoglobin level 10.2 g/dL (11.6–14.8 g/dL). Transvaginal ultrasound showed an enlarged uterus with adenomyosis. She regularly took painkillers and tranexamic acid for menorrhagia and dysmenorrhea. She had received gonadotropin-releasing hormone analogues (GnRHa) and dienogest for adenomyosis but had unsatisfactory results. The patient requested surgical intervention to relieve her discomfort and to discontinue long-term medication use.

Subsequently, the patient was scheduled for laparoscopic-assisted-vaginal hysterectomy and bilateral salpingectomy. The patient was hospitalized for four days and she was discharged on the third postoperative day in good condition. On the sixth postoperative day, the patient came back to our hospital with complaints of low abdominal pain and fever on and off. Her body

temperature was 37.8 °C, blood pressure was 125/72 mmHg, and pulse rate was 92 beats/min. The patient's laboratory values for white blood cell count were 9.7 (3.2–9.2 k cells/ $\mu$ L); hemoglobin was 9.3 (11.6–14.8 g/dL); platelets were 205 (150–400 k cells/ $\mu$ L); high sensitivity C-reactive protein (CRP/hs-CRP) was 55.3 (<5 mg/L) with an elevated value of D-dimer at 2239.8 (<500 ng/mL). Abdominal CT scan revealed a filling defect in the right ovarian vein, which was highly suspicious of thrombosis (Figs. 1 and 2). A multidisciplinary team discussion with the patient's gynecologists, radiologists, and cardiologists, and the patient resulted in a treatment regimen consisting solely of antibiotics, without anticoagulants. A repeat D-dimer examination 24 h later showed no further elevation (2123 ng/mL). The patient was free from fever and low abdominal pain, and she was discharged after 1 week of hospitalization. Abdominal CT was done to follow the OVT and found the total regression of thrombosis (Figs. 3 and 4).

**Discussion**

Ovarian vein thrombosis (OVT) is a rare but potentially serious venous thromboembolism (VTE) that may be associated with various conditions. For example, septic thrombophlebitis and pulmonary embolism (PE) were considered as two of the most serious complications. It is commonly diagnosed in the postpartum period but may also occur secondary to pelvic inflammatory disease, malignancy, hypercoagulability or recent pelvic surgery [1,2]. OVT was first reported in 1956 at a postpartum woman [2]. According to the latest statistics, OVT happened in 0.05–0.18% of all puerperium or postpartum women and the risk may be even higher in cesarean section cases [3]. OVT can incidentally occur in patients who have undergone total abdominal hysterectomy and bilateral salpingo-oophorectomy with retroperitoneal lymph node dissection because the surgery may cause intimal injury of the vessel endothelium, rendering them prone to thrombosis [1]. 70–90% of OVTs happened in the right ovarian vein, whereas 11–14% were in both sides [4]. This can be explained by the right ovarian vein being longer than the left and with incompetent valves. Inferior vena cava and right ovarian vein could be compressed due to dextrorotation of the uterus during pregnancy. The acute angle that the right ovarian vein enters the inferior vena cava makes it more easily to be compressed.

It is often challenging to diagnose OVT because it manifests as nonspecific symptoms such as vague diffuse abdominal pain, fever, nausea, and vomiting that mimic acute abdominal disease [5]. Therefore, diagnosis of OVT requires highly clinical suspicion. OVT



Fig. 2. Coronal contrast-enhanced CT demonstrated right ovarian vein (arrows) with low-density filling defect within it.

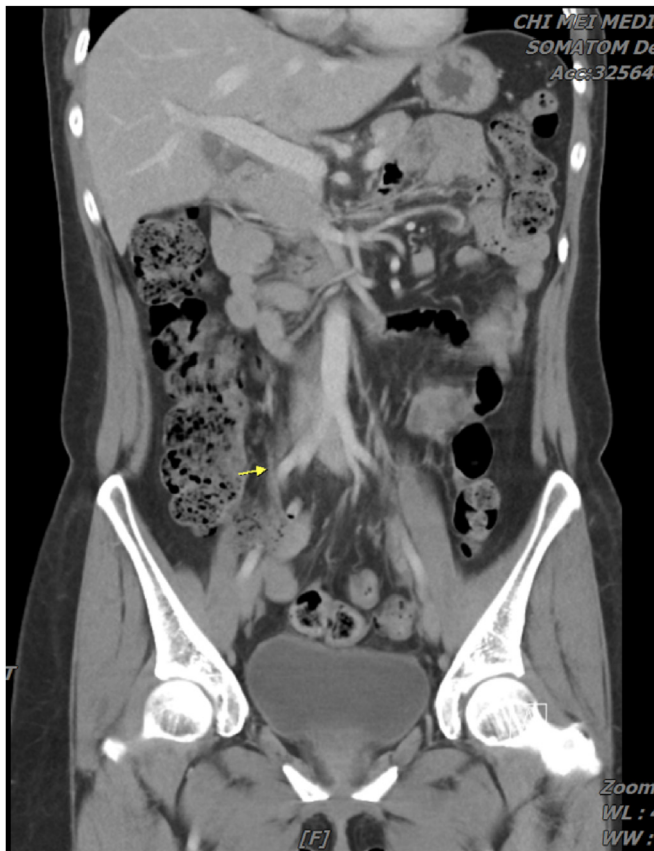


Fig. 3. Axial contrast-enhanced CT demonstrated right ovarian vein (arrows) with resolved thrombus.



Fig. 1. Axial contrast-enhanced CT demonstrated right ovarian vein (arrows) with low-density filling defect within it.

can be diagnosed by color Doppler ultrasound, contrast-enhanced CT scan, and magnetic resonance imaging (MRI) [6]. The typical findings of OVT on color Doppler ultrasonography include tubular hypoechoic adnexal masses or iliac fossa masses lateral to the great abdominal vessels [7]. Although color Doppler ultrasound is easily available, low cost, and without contraindication, it is limited by operator-dependent skill and restricted by obesity to visualize the ovarian veins. The characteristic findings of OVT on CT consist of a tubular structure with an enhancing wall and low attenuation



**Fig. 4.** Coronal contrast-enhanced CT demonstrated right ovarian vein (arrows) with resolved thrombus.

thrombus in the expected location of the ovarian vein. CT with intravenous contrast has 100% sensitivity and 99% specificity [8,9]. It's a very accurate way to diagnose OVT but with some restrictions during pregnancy due to exposure to pelvic radiation and intravenous contrast. MRI has 92% sensitivity and 100% specificity but is more costly compared with CT [8]. Thus, CT or MRI is often required to confirm the presence and extension of the thrombosis.

D-dimer is a product of fibrin degradation that could be used as a marker of the hypercoagulation stage. Elevation of D-dimer represents fibrin formation and fibrinolysis. D-dimer level is a nonspecific marker of deep-vein thrombosis (DVT) with a high negative predictive value. Previous studies have indicated that negative D-dimer could be used to rule out the presence of DVT, but high D-dimer levels cannot confirm the presence of DVT, as it may be related to advancing age, pregnancy, surgery, inflammatory or infective status, and some cancers [10]. Moreover, there is no useful cutoff value for D-dimer to confirm the presence of OVT.

The most common treatment of OVT is anticoagulation therapy. Until now, there is no standard guideline for the use of anticoagulation for OVT. The British Committee for Standards in Hematology suggests an anticoagulant treatment duration of 3–6 months for women with postpartum OVT, but treatment for incidentally detected isolated OVT in cancer patients with pelvic surgery may not require [11]. The choices of anticoagulants include warfarin, low molecular weight heparin, Vitamin K antagonists, rivaroxaban, and apixaban. Among which, warfarin and low-molecular-weight heparin were most commonly used, there is limited data to support the use of novel oral anticoagulants (NOACs) in OVT. Lenz et al. analyzed 219 OVT cases and recommended treatment with anticoagulants when s OVT with PE was

present [12]. Antibiotics as empiric treatment may be indicated if there is sign of infection. The duration of use could range from 48 h to 7 days, depending on the response to treatment [13]. Previous publication has indicated that there was no difference in the outcome of OVT between patients who received antibiotics alone or antibiotic combined with anticoagulant therapy [14]. Plastini et al. included 50 OVT patients in their study; three patients were treated with anticoagulants and antibiotics, and 30 patients were treated with anticoagulation alone. No statistically significant clinical difference was found between two groups [15]. Compare to previous publications, our patient was promptly diagnosed of OVT with the aid of CT before the deterioration of clinical situation. Although her initial serum D-dimer level was high but repeated D-dimer testing within 24 h after adequate hydration indicated that there was no further thrombosis progression.

In conclusion, the diagnosis of OVT requires highly suspicious owing to its rarity and non-specific presentation. Although rare, OVT could be life-threatening if thrombosis spread to the critical sites such as brain, heart or lung. CT with contrast medium could detect early OVT with high sensitivity and specificity. Routine apply anticoagulant treatment to all OVT patients remains controversial. It may be needed in some but not for all patients.

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### Conflict of interest

The authors have no conflicts of interest relevant to this article.

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