



## Case report

## Transient elevations of liver enzymes and ovarian vein thrombosis arising after total laparoscopic hysterectomy



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## ABSTRACT

Ovarian vein thrombosis in non-pregnant patient is a rare clinical entity. Among 170 patients who underwent total laparoscopic hysterectomy (TLH) in our hospital from December 2011 to December 2015, we have one case of ovarian vein thrombosis (0.0059%). A 42-year-old woman had a fever of 39 °C on the fourth day after TLH. A blood test revealed elevations of liver enzymes and D-dimer (AST 1157 U/L, ALT 942 U/L and D-dimer >30 µg/L). Computed tomography (CT) scan with intravenous contrast agent demonstrated right ovarian vein thrombosis which caused decline in blood flow to liver and acute liver dysfunction. Low-molecular weight heparin was initiated and liver enzymes reduced rapidly. On the seventeenth day after TLH, CT scan revealed a recanalization of the ovarian vein. We report the clinical outcomes of the case attempted with a small review of the literature.

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## Introduction

Ovarian vein thrombosis (OVT) is a rarely expressed phenomenon that typically occurs in the postpartum period. It is also known to be associated with various complications such as malignancy, pelvic inflammatory disease and pelvic surgery. Herein, we present a rare case of a 42 year-old woman four days after total laparoscopic hysterectomy (TLH) who suffered transient elevations of liver enzymes because of OVT and have attempted a small review of the literature.

## Case report

A 42-year-old woman (gravida 2, para 2) was referred to us with difficulty of urination due to a newborn head-sized uterine fibroid. After 3 doses of GnRH agonist 1.88 mg, she underwent TLH. She didn't have any past history, including thrombosis. Operation time was 107 min, weight of resected uterus was 280 g, and loss of blood

during operation was 120 ml. She made good progress and was going to be discharged from the hospital on the fifth day after the operation. However, on the fourth night after the operation, she experienced a high fever over 39 °C. Physical examination revealed no symptomatology. A transvaginal ultrasound found only a little fluid in the Douglas' pouch because of the operation. In suspicion of postoperative infection, a blood test was performed and it showed elevation of CRP (4.43 mg/dL), T-Bil (2.6 mg/dL), AST (1157 U/L), ALT (942 U/L) and D-dimer (>30 µg/L). These findings were implicative of thrombosis, afterwards, an emergent computed tomography (CT) with intravenous contrast agent was performed. It demonstrated a hypodense filling defect within the right ovarian vein originating in the right adnexal region, terminating in the inferior vena cava (IVC) just below the level of the right renal vein (Fig. 1). As another CT before operation revealed no hypodense filling defect, it presented an acute thrombus obstruction in the right ovarian vein.

Further blood tests revealed absence of viral hepatitis and autoimmune hepatitis. No malignant tumors were found by ultrasonography, CT nor tumor markers. Thrombotic diatheses were denied because lupus anticoagulant, protein C and protein S were all within normal limits. These results suggested that the uterine fibroid compressed ovarian veins over a long time and the resulting impaired blood flow caused a thrombus as a consequence of artificial pneumoperitoneum or surgery. Thereafter, the extending thrombus caused a decline in blood flow to the liver and acute liver dysfunction.

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**Fig. 1.** Coronal contrast enhanced CT scan demonstrating dilated right ovarian vein (14 mm) with a long segment filling defect consistent with thrombus (white arrows).

Although IVC Greenfield filter was considered for prevention of pulmonary embolism (PE), it wasn't implemented because it was thought that it might obstruct the renal vein. Through anticoagulation therapy with low molecular weight heparin and warfarin, D-dimer, CRP and liver enzymes reduced rapidly. On the seventeenth day after the operation, CT revealed a recanalization of the ovarian vein. She was discharged home with warfarin which was continued for three months. D-dimer was followed up and didn't elevate even after the completion of warfarin regime.

## Discussion

A 42-year-old woman had a fever of 39 °C on the fourth day after TLH. A blood test revealed elevations of liver enzymes and D-dimer (AST 1157 U/L, ALT 942 U/L and D-dimer >30 µg/L). Computed tomography (CT) scan with intravenous contrast agent demonstrated right ovarian vein thrombosis which caused decline in blood flow to liver and acute liver dysfunction. Low-molecular weight heparin was initiated and liver enzymes reduced rapidly. On the seventeenth day after TLH, CT scan revealed a recanalization of the ovarian vein. What follows is a report of clinical outcome of the case attempted with a small review of the literature.

There are some complications related to the uterine fibroid in laparoscopic surgery.<sup>1–5</sup> Ovarian vein thrombosis is a rare entity and most cases are associated with pregnancy and the estimated incidence ranges between 0.05 and 0.18% of pregnancies. 80–90% of cases occur several days after delivery.<sup>6</sup> Pelvic inflammatory disease, malignancies, pelvic mass, pelvic surgical procedures and hyper coagulation condition are also reported as risk factors for ovarian vein thrombosis.<sup>7,8</sup> 80–90% of OVT cases occur in the right side. This predominant right localization is partly because dextro-torsion of the enlarging uterus due to pregnancy, which causes compression of the right ovarian vein and right ureter as they cross the pelvic rim. Also, the right ovarian vein is longer than the left and has many incompetent valves which act as niduses for thrombosis.<sup>8</sup>

In this case, risk factor for OVT was a pelvic mass and pelvic surgical procedures. Laparoscopic surgeries are less invasive than abdominal surgeries, but, there are three case reports of OVT after laparoscopic surgeries.<sup>9–11</sup> From December 2011 to December 2015, 170 patients underwent TLH at our hospital, however, only this case suffered from OVT (0.0059%). It is naturally surmised that large tumors and large operative stresses are more likely to cause thromboses, so we analyzed them statistically. The weight of resected uterus, the operation time and the blood loss during operation was 262 g (interquartile range, 188–377), 190 min (interquartile range, 157–217), 150 ml (interquartile range, 65–325), respectively. In this case, they were 280 g, 107 min, 120 ml, respectively. No statistically significant differences were found between the case with OVT and cases without OVT in regards to tumor size and operative stresses. Other factors remain unclear, thus further investigations are required.

Common symptoms and signs of OVT include lower abdominal pain, fever and leukocytosis.<sup>7</sup> The mortality of OVT can be as high as 5% and is mostly due to PE the incidence of which is reported to be 13.2%.<sup>12</sup> Almost all mortal cases are associated with pregnancy, and unlike puerperal OVT, OVT caused by malignant tumor or manifesting after surgical procedure did not appear to generate adverse clinical effects. It is even reported that routine anticoagulation and antibiotics for such OVT cases may not be necessary because the thrombus can resolve without complications, even in the absence of any treatment.<sup>13</sup> Our case had no symptoms and no coexistence of PE. However, it turned out that OVT can cause organ failure by inadequate blood flow. Although it is rarely observed, thrombus in the ovarian vein can expand to IVC, renal veins and liver veins and can interrupt blood flow to organs like kidneys and the liver. Chronic interruption of blood flow may cause irreversible dysfunction of the organs concerned so that it was implied that anticoagulation therapy should be adopted immediately.

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