Puerperial ovarian vein thrombosis
post gynecological surgery
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Patient: 31 years, female

Clinical History:
We present a case of postcaesarean ovarian vein thrombosis and describe its clinical and radiological findings. Differential diagnosis and management are discussed.

Imaging Findings:
Three days after cesarean section, a 31-year-old woman presented with fever 39ºC with infection of the cesarean wound and unspecified pain in the right lower quadrant of the abdomen. No complications had been observed during pregnancy. White blood cell count was 12×10^9 and S.epidermidis was isolated from the secretion of the surgical wound. Abdominal examination revealed tenderness in the right iliac fossa with a palpable mass. Antibiotic treatment neither resolved the fever nor the abdominal pain.

On the 12th postoperative day an abdominal ultrasound, including color-flow Doppler showed a solid right adnexal mass and a tubular right ovarian vein, without flow, extending from the adnexal mass towards the inferior caval vein (ICV) (Fig. 1). Abdominal multislice CT with reconstruction confirmed the ultrasounds results, revealing a mass adjacent to the enlarged uterus and ascending thrombosis of the right ovarian vein extending into the ICV (Fig. 2, 3, 4, 5, 6). Alternative intravenous broad-spectrum antibiotic and anticoagulation with heparin were administered. The patient's symptoms resolved and she was discharged in good health on the 20th postoperative day with continued anticoagulant treatment. The patient did not present any prothrombotic risk factors, e.g. factor V Leiden, protein S or C deficiency.

Follow-up ultrasound and CT examination after 45 days showed complete resolution of the thrombus (Fig. 7, 8).

Discussion:
The incidence of postpartum ovarian vein thrombosis (OVT) occurs between 1:600 and 1:2000 (3) deliveries. OVT is an uncommon condition that results in inflammation and thrombosis of one or both ovarian veins. A total of 80-90% of cases involve the right ovarian vein, 6% the left ovarian vein, and 14% are bilateral (4). This is believed to be, in part, due to the commonly occurring compression of the right ovarian vein by dextrotorsion of the enlarging uterus. The pathogenesis is based on the Virchow's triad (5): blood flow stasis, hypercoagulability, and endothelial injury. With the hypercoagulable state of the puerperium, blood flow in the ovarian veins decreases. Endothelial injury is often due to exogenous factors such as surgical trauma or intrauterine bacterial infection. The ovarian veins arise from the venules draining the ovaries, the broad ligament, and the infundibulopelvic brim. Both vessel are long and unbranched, and have incompetent valves. During pregnancy, the ovarian vein diameters increase 3-fold, flow capacity becomes 60 times greater, and valvular incompetence is exacerbated. After childbirth, blood flow in the ovarian veins immediately decreases, leading to venous collapse and stasis (1st component of Virchow's triad). Altered coagulation (2nd component) is common after pregnancy. Hypercoagulability is caused by increased production of coagulation factors 1, 2, 7, 10, and 11 and increased plateletadhesiveness. These changes usually
peak on the 4th postpartum day. The 3rd component of Virchow's triad i.e., intimal injury, is often due to exogenous factors. For example, as was our case, the most common predisposing factor for postpartum ovarian vein thrombosis is intrauterine bacterial infection.

The main symptom of clinically significant ovarian vein thrombosis is pain in the lower abdomen and pyrexia, usually appearing within ten days after delivery, no response to antibiotic treatment, and a palpable mass in the right iliac fossa. POVT is a rare complication with potentially life-threatening consequences, including: extension of the thrombus in the inferior vena cava, renal veins or iliofemoral veins; pulmonary thromboembolism (3-33%); acute obstruction of a ureter; ovarian infarction, free-floating caval thrombus, and death (6, 7).

If OVT is suspected, ultrasound and CT scan is recommended for initial diagnosis and follow-up examination. On US scans the OVT appears as a hypoechoic or anechoic round to oval mass with an echogenic center representing the thrombus. CT is considered the modality of choice for the identification of this underdiagnosed entity (8, 9), although other modalities such as Doppler ultrasound and magnetic resonance imaging have also been used. The diagnosis on CT is suggested in the presence of a tubular structure in location of the ovarian vein with a low density center and peripheral enhancement. Enlargement of the ovarian vein and perivascular edema may also be present. Differential diagnosis includes: appendicitis, adnexal torsion, pyelonephritis and anexial abscess.

Treatment consists of broad-spectrum antibiotics and anticoagulants. Once thrombolisis has begun, acinocumarol is administered for 3-6 months. Surgical treatment is reserved for patients with failed anticoagulant and antibiotic therapy, and cases with recurrent pulmonary embolism, or a “free floating” thrombus.

**Differential Diagnosis List:**
- ovarian vein thrombosis

**Final Diagnosis:** ovarian vein thrombosis

**References:**


Description: Cross-sectional view of the abdomen showing an ovarian and cava veins filling defects suggestive of thrombus Origin:
Description: Abdominal computed tomographic scan shows hypodense thrombus filling the right ovarian vein Origin:
Description: Coronal reconstruction CT of the abdomen showing an adnexal mass adjacent to the enlarged uterus Origin:
Figure 4

Description: Coronal reconstruction CT of the abdomen showing an ascending thrombosis of the right ovarian vein. Origin:
Description: Coronal reconstruction CT of the abdomen showing a hypodense tubular structure in the location of the right ovarian vein, and hypodense filling defect in the cava vein representing the extension of the thrombus into the cava vein. Origin:
Description: Coronal reconstruction CT follow-up at 45 days showing resolution of the thrombus
Origin:
Description: Transverse ultrasonography showing the right ovarian vein with an echogenic center secondary to thrombus. Origin: