



Acute right iliofemoral deep vein thrombosis mimicking acute appendicitis in the postpartum period: a case report

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ABSTRACT

The risk of venous thromboembolism increases during pregnancy and postpartum. The incidence in the first six weeks following delivery is approximately 0.15%. Deep vein thrombosis may present with acute appendicitis-like symptoms such as right iliac fossa pain, nausea and vomiting.

A 22-year-old woman was admitted with complaints of abdominal pain and vomiting 20 days after spontaneous vaginal delivery. Physical examination and radiological findings were compatible with acute appendicitis. Preoperative re-examination and re-evaluation of computed tomography revealed concomitant deep vein thrombosis on the right side. The patient underwent laparotomy and a normal appendix and ovaries were found. She had an uneventful recovery. Anticoagulant treatment was administered for six months.

Early and correct diagnosis should be established to avoid complications of deep vein thrombosis and prevent unnecessary surgical interventions. Physicians should be aware of deep vein thrombosis in women who present acute appendicitis-like symptoms, especially during pregnancy and in the postpartum period.

KEYWORDS

Acute appendicitis – Anticoagulant – Deep vein thrombosis – Puerperium – Postpartum

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Background

The risk of venous thromboembolism (VTE) increases during pregnancy and postpartum due to hypercoagulability, endothelial damage, hormone-related changes in venous flow and external compression of veins by the enlarged uterus.¹ VTE is the major cause of maternal death in developed countries. The incidence of VTE in the first six weeks following delivery is reported to be approximately 15/10000.² Acute deep vein thrombosis (DVT) commonly manifests with lower extremity pain and swelling. It may rarely present with abdominal pain, fever, nausea or vomiting. This clinical manifestation may lead to diagnostic confusion with intra-abdominal pathologies. Prompt and accurate diagnosis is essential to avoid potential complications and unnecessary interventions.³

We describe a case of DVT mimicking acute appendicitis in the postpartum period and heighten awareness about this rare but challenging entity.

Case history

A 22-year-old previously healthy woman was admitted to the emergency department with complaints of abdominal pain, nausea and vomiting for the past four days. She had a history of a spontaneous vaginal delivery 20 days ago (gravidity 2, parity 2). There were no complaints of vaginal bleeding or discharge. Physical examination revealed severe tenderness and muscular defence on right lower quadrant and right inguinal region. Urinalysis and blood tests were unremarkable except for mild anaemia (9.7g/dl), elevated white blood cell count (20100/mm³) and C-reactive protein (6mg/dl). A gynaecological examination excluded any postpartum complications including uterine infection.

Abdominal ultrasound detected free fluid but was insufficient to visualise the appendix. Abdominal contrast-enhanced computed tomography (CT) was consistent with acute appendicitis 9mm in diameter with pericaecal free fluid (Fig 1). The patient was hospitalised for

appendectomy and intravenous fluid and antibiotics were administered.

Once in hospital, the patient had right lower extremity pain and swelling for the three days. On examination of the limb, tenderness and redness were found. The ipsilateral leg was mildly swollen. CT was re-evaluated for DVT and the diagnosis of right iliac and femoral vein thrombosis was established (Fig 2). The cardiovascular surgeon confirmed the diagnosis and recommended low molecular weight heparin (LMWH) in the postoperative period and follow-up in the outpatient clinic.

As there was a lack of access to laparoscopy in the prevalent emergency conditions during that period of time, the patient underwent laparotomy by McBurney incision under spinal anaesthesia. There was no free fluid on right iliac fossa. The appendix vermiformis and ovaries were found to be normal and Meckel's diverticulum was absent. An appendectomy was performed, following which 6,000 units of LMWH were administered twice daily starting eight hours after surgery. The cardiovascular surgeon followed-up daily and the patient had an uneventful recovery. The patient was discharged on the fourth postoperative day.

Postoperative re-evaluation of the CT by experienced radiologists revealed an elevated peritoneum due to perivascular oedema on right iliac fossa and a normal appendix vermiformis (Fig 3). There were no radiological findings for right-sided iliac vein compression syndrome. Pathological examination confirmed a normal appendix vermiformis. The patient was followed-up by a cardiovascular surgeon for six months with LMWH treatment. She became pregnant again during this time and delivered another healthy child. After the last delivery, she has remained asymptomatic and no signs of recurrence. Doppler ultrasound revealed complete venous recanalisation.

Discussion

The postpartum period is associated with an increased risk of VTE because hypercoagulability is considered to be at the maximum level just after delivery.² The risk of VTE is reported to be 2.5–84 times more common in the first six weeks postpartum compared with other reproductive-aged women.^{1,2} Diabetes, gestational diabetes, hypertension or multiple deliveries are not related to the increased risk of VTE. Similar to the general population, older age, smoking and obesity are associated with an increased risk of VTE. Caesarean delivery and antenatal and perinatal complications including anaemia, pre-eclampsia, antepartum or postpartum haemorrhage and postpartum infection were reported to increase the risk of VTE.² Pulmonary embolism is a well-recognised and serious complication of DVT. DVT-related pulmonary embolism has an incidence of 38%.² Anaemia was the only risk factor for VTE in our patient and pulmonary embolism was not experienced during follow-up.

DVT may rarely present with abdominal signs. There are only a limited number of case reports and case series describing DVT presenting with abdominal pain in the literature.^{5–8} Possible mechanisms of abdominal signs in DVT are still unclear and consist of some hypotheses in literature. Björgell *et al* reported that iliac DVT with phlebitis and retroperitoneal oedema might have been the cause of abdominal pain in their patient.⁵ Voorhoeve *et al* thought that abdominal pain may occur due to a mechanism similar to those in the calf tenderness which occurs in the calf muscles when thrombosis develops from the venous sinusoids.⁶ We think that abdominal pain and peritoneal signs may be associated with peritoneal irritation, which occurs due to perivascular inflammation and oedema. The severity of peritoneal irritation seems to result in a wide range of clinical presentation from mild pain to acute abdomen. Our patient probably had a stretched peritoneum with oedema and a muscular defence was seen as a consequence of increased peritoneal irritation by palpation, similar to most of the reported cases.

DVT may mimic many intra-abdominal pathologies, some of which require surgical intervention. Acute appendicitis, enteritis, ureteral colic, ovarian torsion and pelvic inflammatory diseases are relevant in differential diagnosis.^{5,4} This can be problematic because the incidence of DVT is less than other pathologies such as acute appendicitis or ureteral colic and physicians are inclined to suspect of these more common pathologies.

Magnetic resonance imaging, ultrasound, CT or venography may be performed to diagnose DVT.^{5,4} In emergency conditions, however, an early diagnosis is primarily associated with clinical suspicion and awareness of the physician. Radiological screening alone may be inadequate when there is no suspicion of DVT, as in our case.

A treatment similar in those in the general population is recommended. In the acute phase, conservative treatment with LMWH is the most preferred treatment option, while



Figure 1 Appendix 9mm in diameter (arrow) and free fluid on the right iliac fossa in the first evaluation of computed tomography

surgical or vascular intervention is rarely necessary.³ Anticoagulant therapy is continued for 12–24 weeks after the acute phase.⁹ Catheter-directed thrombolysis is a suitable option to eliminate thrombus and prevent the post-phlebitic syndrome for selected patients with proximal

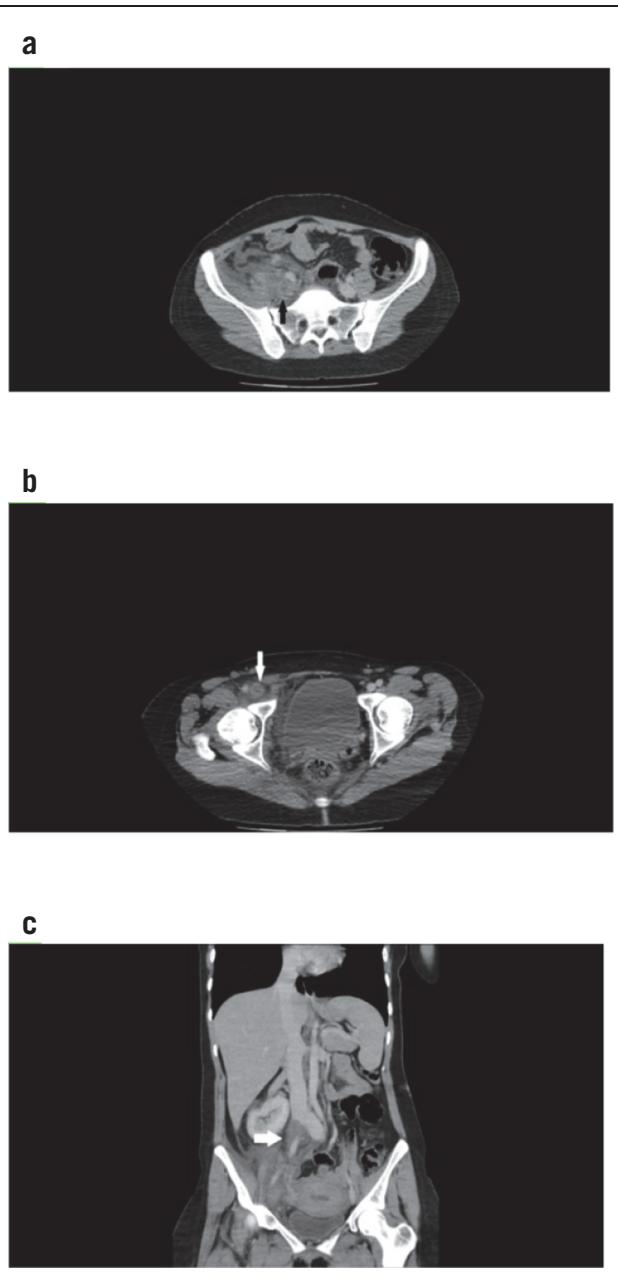


Figure 2 a) Thrombosed right iliac vein (arrow) and perivascular oedema. Notice that the iliac arteries and contralateral iliac vein are contrast enhanced. b) Thrombosis continues throughout the right femoral vein (arrow). c) Contrast-enhancement throughout right iliofemoral vein is absent due to complete thrombosis (arrow).

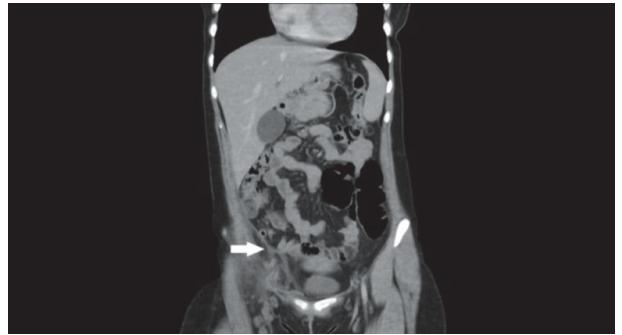


Figure 3 Elevated peritoneum due to perivascular oedema (arrow) was detected during a re-evaluation of computed tomography. Notice that a normal appendix vermis is adjacent to the elevated peritoneum.

DVT. In our patient, cardiovascular catheter-directed thrombolysis was not indicated because of the mild symptoms of venous congestion in the leg. The emergency surgery requirement for acute appendicitis was a relative contraindication for thrombolysis. Pharmacomechanical catheter-directed thrombolysis with a low-dose thrombolytic agent or percutaneous mechanical thrombectomy with no thrombolytic agent might be reasonable options for patients with limb-threatening DVT that is detected perioperatively.

Aroke *et al* described a similar case of DVT in a pregnant patient who underwent laparotomy with a misdiagnosis of acute abdomen.⁵ That patient was diagnosed after discharge. Our patient was in the third week postpartum. In our case, a false-positive diagnosis of acute appendicitis was established by physical examination and radiological screening. Although several physicians from departments of emergency, gynaecology and surgery examined the patient and a radiologist evaluated the ultrasound and CT scans, the possibility of DVT was not considered until the patient complained of right lower extremity pain and swelling.

Conclusion

DVT is a rare but risky condition in pregnancy and the postpartum period. Prompt and accurate diagnosis is necessary to avoid unnecessary surgical interventions and potentially lethal DVT complications such as pulmonary embolism. In the presence of symptoms similar to those in acute appendicitis, physicians should be aware of the possibility of DVT, especially in high-risk patients such as pregnant or puerperal women. When a diagnosis of DVT is established in a patient with abdominal pain or acute abdomen signs, CT scans should be reviewed by experienced radiologists to support or exclude a concomitant abdominal pathology before deciding on surgical intervention.

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