A case report of oral contraceptive misuse induced cerebral venous sinus thrombosis and dural arteriovenous fistula

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Abstract

Rationale: Consumption of oral contraceptive pills (OCP) is a known risk factor for cerebral venous sinus thrombosis (CVST) among women. Development of dural arteriovenous fistula (dAVF) afterwards was very uncommon. We present a rare chronic complication of development of dAVF after CVST.

Patient concerns: A 22-year-old woman suffered headache for a week. She was then admitted into our hospital.

Diagnosis: Contrast enhanced magnetic resonance venography (MRV) demonstrated the thrombosis of the left transverse-sigmoid sinus the second day.

Interventions: The intravenous thrombolysis was carried out. As the symptoms improved, the patient was discharged, while the treatment with oral dabigatran continued. However, 3 months after the onset, magnetic resonance imaging (MRI) showed swelling brainstem, and digital subtraction angiography (DSA) confirmed a dAVF. Clipping of the fistula was conducted, and her clinical symptoms improved gradually.

Outcomes: The patient was transferred to rehabilitation center later, and received follow-up care.

Lessons: When a patient taking OCP and suffering from a sudden headache, a clinical suspicion of possible CVST should always arise to avoid the onset of dAVF as soon as possible.

Abbreviations: CRP = C-reactive protein, CT = computed tomography, CVST = cerebral venous sinus thrombosis, dAVF = dural arteriovenous fistula, DSA = digital subtraction angiography, DWI = diffusion weighted image, MRA = MR angiography, MRBTI = magnetic resonance black-blood thrombus imaging, MRI = magnetic resonance imaging, MRV = magnetic resonance venography, OCP = oral contraceptive pills, SWI = susceptibility weighted images.

Keywords: cerebral venous sinus thrombosis (CVST), dural arteriovenous fistula (dAVF), oral contraceptive pills (OCP)

1. Introduction

Cerebral venous sinus thrombosis (CVST) is a rare form of venous thromboembolism with an estimated annual incidence rate round 3~7/1,000,000.[1] The incidence rate is higher among women,[2] especially in the Asian area.[3] The risks for CVST include irregular menstruation, pregnancy, trauma, surgery, postpartum state, and hormonal changes in young women, and the patients often suffer non-specific headache.[4,5] In addition, consumption of oral contraceptive pills (OCP) is a known risk factor for CVST among women.[6]

Development of dural arteriovenous fistula (dAVF) after CVST was very uncommon. dAVFs could either be acute or chronic complications.[1] We present a case of chronic development of dAVF after CVST with OCP to raise the awareness of the disease in clinical management.

2. Case report

A 22-year-old woman suffered severe headache for 1 week. She had a history of consuming OCP for more than 2 months. Head computed tomography (CT) scan displayed the left temporal lobar hemorrhage [Fig. 1]. Laboratory tests revealed slightly elevated levels of C-reactive protein (CRP, 12.6 mg/L) and D-dimers (2.23 μg/mL), and the cranial magnetic resonance imaging (MRI) displayed a local area of hemorrhagic infarction and edema in the temporal lobe [Fig. 2]. In view of clinical suspicion of CVST, on the second day, contrast enhanced magnetic resonance venography (MRV) and T1 contrast-enhanced image demonstrated the thrombosis of the left transverse-sigmoid sinus and internal jugular vein [Figs. 3 and
4]. The intravenous thrombolysis was conducted with warfarin and heparin. The patient was then discharged as the symptoms improved, and at that time the left transverse-sigmoid sinus was still not apparent, and the left internal jugular vein was small. A month later, follow-up MRI examination showed that her left transverse-sigmoid sinus was still not recanalized, and the left temporal lobe was softened on T2WI [Fig. 5]. Oral dabigatran was taken for continuing treatment. However, 3 months after the onset, the patient had a progressively paroxysmal dizziness, deteriorated nausea and vomiting. After her admission, MRI
showed edema within brain stem on T2WI, and displayed obvious enhancement after contrast injection. Edema and mass effect was mild [Figs. 6 and 7], and MR angiography (MRA) was normal. At first, this case was misdiagnosed as demyelination or encephalitis. The clinical symptoms of the patient aggravated rapidly with choking, hoarseness and lip skewing to the left. Digital subtraction angiography (DSA) confirmed a dAVF fed by the left occipital artery and drained into the left sigmoid sinus [Fig. 8]. These characteristics corresponded to the hypointensity in the region of MRI T2. The patient was then transferred to neurosurgery. Subsequently, clipping of the fistula was conducted.
Cerebral venous thrombosis (CVT) is a rare condition involving both intracranial veins and sinuses. Young age, female gender, oral contraceptives, cancer, trauma, and hereditary coagulopathy can increase the risk for CVST. These non-specific clinical symptoms also mimic other neurological disorders, for example, dAVF disguised as CVT. The elevated CPR, D-dimer concentration of laboratory findings were helpful in CVST diagnosis. CT, MRI and MRV features could also help to obtain an early and differential diagnosis. Imaging techniques including susceptibility weighted images (SWI), magnetic resonance black-blood thrombus imaging (MRBBI), diffusion restriction on diffusion weighted imaging (DWI), a filling defect on unenhanced MRI coronal T2 image and MRV without contrast could detect the thrombus. Although DSA is regarded as the gold standard for diagnosing CVST, contrast-enhanced MRI were useful for diagnosis and follow-up to avoid the onset of complications such as permanent parenthetical damage, cerebral hemorrhage and dAVF as soon as possible.

4. Conclusion
When taking OCP, a known risk for CVST, women should obey physician prescription. In the case when a patient shows non-specific clinical symptoms of headache and seizures, a clinical suspicion of possible CVST should always arise. MRV and contrast-enhanced MRI were useful for diagnosis and follow-up to avoid the onset of complications such as permanent parenthetical damage, cerebral hemorrhage and dAVF as soon as possible.

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