A Case of Iliopsoas Abscess and Cerebellum Abscess Caused by Misplacement of Central Venous Catheter

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A 64-year-old female was admitted due to iliopsoas abscess caused by misplacement of a central venous catheter (CVC) into the ascending lumbar vein (ALV). Despite removing the CVC and administering an antimicrobial agent, her general condition did not improve. Therefore, we performed a contrast-enhanced head computed tomography (CT) scan. The CT scan revealed a cerebellum abscess. Surgical cerebellum abscess drainage was thus performed urgently. We recommend using anteroposterior radiographs, J-guide wire catheter and ultrasound guidance to prevent misplacement. If misplacement of the CVC is suspected, it should be removed and a CT scan performed without hesitation as soon as possible.

Keywords: catheter misplacement, iliopsoas abscess, cerebellum abscess, ascending lumbar vein

Case Report

A 64-year-old female had been undergoing nasal feeding due to anorexia nervosa and depression for about a year at another hospital. One day, she developed fever approximately three weeks prior to admission at our hospital. She was diagnosed with urinary tract infection and treated with an antibiotic. CVC was inserted from the right femoral vein. Her fever reduced temporarily, although her inflammatory reaction worsened progressively. She developed fever again two days prior to admission at our hospital. She had progressive disturbance of consciousness. She was brought to the emergency department of this hospital. She had a past medical history of atrial fibrillation. Initial vital signs were as follows: blood pressure of 116/83 mmHg, heart rate of 115 beats/min, respiratory rate of 15 breaths/min, SpO₂ of 97% on room air, body temperature of 36.7°C, and the Glasgow Coma Scale was E2V1M1 (total 4/15). Physical examination revealed edema in her entire body, while other system examinations revealed nothing in particular. Laboratory studies were as follows: white blood cell (WBC) count 43,410/µl, hemoglobin (Hb) 10.8 g/dl, and C-reactive protein (CRP) 19.13 mg/dl. Cerebrospinal fluid (CSF)
analysis was as follows: cells 1/µl, WBC 1/µl, protein 10 mg/dl, glucose 67 mg/dl. There was neither cardiac anomaly nor vegetation on echocardiography. Imaging findings on admission were as follows: Plain head CT scanning revealed a low density area in the cerebellar hemisphere and hydrocephalus due to press of fourth ventricle (Figure 1-A). Contrast-enhanced abdominal CT scan revealed swelling of the right iliopsoas muscle with gas and misplacement of the tip of the catheter (Figure 1-B). The patient was diagnosed with iliopsoas abscess caused by misplacement of the CVC into the ALV and hydrocephalus with cerebellum infarction. After the catheter was removed, antibiotic treatment consisting of linezolid (1200 mg/day) and cefozopran (4 g/day), and antihydropic treatment with glycerin (800 ml/day) (Figure 2) were initiated. Cultures of blood, spinal fluid, and the catheter tip were all negative, although iliopsoas muscle abscess drainage fluid was positive only for Methicillin resistant Staphylococcus epidermidis (MRSE). On the 5th hospital day, a plain head CT scan showed progression of hydrocephalus. Ventricular drainage was performed. However hydrocephalus and disturbance of consciousness did not improve. On the 11th hospital day, a contrast-enhanced head CT scan revealed ring enhanced mass by contrast medium in a low density area of the cerebellar hemisphere (Figure 1-C). We diagnosed cerebellum abscess and performed surgical cerebellum abscess drainage. After the surgical drainage, her inflammatory reaction and consciousness state improved. On the 23th hospital day, a contrast-enhanced abdominal CT scan and head CT scan revealed that the iliopsoas muscle and cerebellum abscess had reduced (Figure 1-D). However, the patient died due to aspiration pneumonia caused by vomiting on the 30th hospital day.

Figure 1. 1-A: Plain brain CT scan reveals low density area on right cerebellum and hydrocephalus due to pressure of ventriculus quartus. 1-B: Contrast-enhanced abdominal CT scan revealed a air image in swelling right iliopsoas and misplacement of the tip of the catheter. 1-C: Contrast-enhanced brain CT scan revealed ring enhanced by contrast medium in low density area of right cerebellum on the 11th hospital day. 1-D: The both iliopsoas and cerebellum abscess are reduced on the 23th hospital day.
**Discussion**

About 50% of brain abscesses are caused by direct infection spreading from the otorhinolaryngologic region, and about 25% of brain abscesses are due to hematogenous infection spreading. In our case, there was notable evidence of infection in the paranasal sinuses and oral cavity. We therefore considered hematogenous infection from the iliopsoas abscess as the cause of the cerebellum abscess. Iliopsoas abscess usually arises from the spread of infection of the digestive canal, urinary tract and orthopedics. We suspect the cause of iliopsoas abscess in this case was misplacement of the CVC into the ALV. There are many reports of misplacement of the CVC in pediatric cases and left femoral vein approach cases. However, there are few reports of adult cases and right femoral vein approach cases such as our case. Introduction of a catheter into the ALV is more likely to occur on the left side because of a lower degree of angulation between the iliac vein and the ALV. There are some ways to avoid the serious complication associated with malposition. Lateral deviation of catheters on the anteroposterior radiographs represents cannulation of the ALV at the L4-L5 level. Furthermore, the catheter may be safely repositioned into the IVC with the use of a J-guide wire catheter or by bedside ultrasound guidance. If a catheter is misplaced, it takes 14.8 days on average to be diagnosed. However, the elderly and mental disorder patients usually find it difficult to personally complain of symptoms. Therefore, we considered that it will take several days for such a condition to be diagnosed in our case. This suggests that it is important to remove the catheter and perform a CT scan without hesitation, if misplacement of the catheter or leakage of drug and infusion fluid from vessels into surrounding tissue is suspected. Dyspnea, pressure reduction, abdominal distension, low back pain and pleural effusion are remarkable symptoms that should trigger suspicion of misplacement of the catheter into the ALV and iliopsoas abscess formation.

**Conclusion**

We reported a case of cerebellum abscess following iliopsoas abscess caused by misplacement of a CVC. Use of anteroposterior radiographs, J-guide wire catheters and ultrasound guidance has been reported as the way of reducing the risk of misplacement. We recommend removing the catheter and performing CT scans without hesitation, if catheter misplacement or leakage of drug and infusion fluid from vessels into surrounding tissues is suspected.

**Conflict of interest:** The authors have declared that no conflict of interest exists.

**References**


