Accidental Cannulation of the Ascending Lumbar Vein via Femoral Access

YU-CHUNG KUNG¹, CHAO-HSIEN LEE¹,², CHIEN-LIANG WU¹,²

A 35-year-old young male patient has a past medical history of AIDS with poor compliance. He discontinued HAART by himself for 1 year. He has progressive dyspnea with mild fever (body temperature of 37.9°C) for 3 days prior to emergency room. The chest tomography showed extensive bilateral lung consolidation, infiltrates and ground glass opacities. He took invasive ventilation due to acute respiratory distress syndrome. Pneumocystis Jiroveci pneumonia is of concern, therefore he took Co-trimoxazole 240 mg q6h plus Solu-Medrol 40 mg every 6 hours. The right femoral vein catheter should be removed because an exit site infection occurred. We placed left femoral venous catheter to administer medications and fluids. The abdominal film was performed because of difficulty inserting catheter to premeasured length, lack of blood return, difficulty with removal of the guidewire from the catheter, and easy flushing the device without resistance during inserting central venous catheter (CVC). The abdominal film revealed the catheter passed from the femoral vein into the ascending lumbar vein (ALV) (Fig. 1), therefore the catheter was immediately withdrawn before intravenous fluid was administration.

Identification of malpositioned catheters is critical to proper catheter function and prevention of complications. Due to the potential morbidity...
and mortality involving CVC-associated neurologic events, this problem bears further scrutiny. The ALV arise from the right and left common iliac veins at the level of L5–S1 and join the common iliac veins to the lumbar veins as well as to the subcostal veins (Fig. 2)(1). The catheter may travel from the ALV into the intervertebral plexus, promoting rupture of the vessel wall allowing the catheter to lodge in the epidural space2. Catheter residing in the ALV may induce venous stasis, leading to possible neurologic sequelae, including perforation and further damage to the epidural or subarachnoid space, resulting in spinal cord injury, local mass effects, chemical meningitis, adhesion, seizure(2), shock(3), quadriplegia, paraplegia, and urinary retention(3). Physicians could identify catheter malposition, including cognizance of insertion-related clues, radiographic assessment, and symptoms presenting during the catheter insertion (Table 1)(4). The prognosis is good when malposition is recognized and treated promptly. Even correctly positioned, CVCs can migrate with the dynamic forces. Catheter migration should be suspected in patients presenting with neurologic or sepsis like symptoms.

Identification of malpositioned CVCs dwelling near or within the ALV is critical to patient safety. The malposition of CVCs may be diagnosed under CT scan of the abdomen with intravenous contrast(5), real-time fluoroscopy(3), or ultrasound guidance(6). Selection of an appropriate catheter insertion of lower extremity insertion site is important. Inadvertent catheterization of the ALV occurs pri-

---

Fig. 2  The anatomy of the ascending lumbar vein
Accidental cannulation of ascending lumbar vein

Table 1  Signs and symptoms of catheters residing in or near the ascending lumbar vein

<table>
<thead>
<tr>
<th>Difficulty inserting catheter to premeasured length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of blood return</td>
</tr>
<tr>
<td>Sepsis-like symptoms</td>
</tr>
<tr>
<td>Parenteral nutrition fluid retrieved from CSF after lumbar puncture or markedly abnormal levels of glucose, protein, or lipids obtained from CSF sample</td>
</tr>
<tr>
<td>Seizures or neurologic deficits</td>
</tr>
<tr>
<td>Flaccid quadriplegia</td>
</tr>
<tr>
<td>Urinary retention</td>
</tr>
</tbody>
</table>

Radiographic Clues:

- Left-sided CVC insertion that fails to cross the midline to enter the IVC and appears to overlay the midline
- A bend, kink, or hump in the catheter at the L4–5 level on anterior-posterior view or a zigzag course in the paraspinal area, particularly on left-sided insertions and when the catheter was threaded to or beyond the level of L3
- A 360-degree curl in the catheter in the inguinal region with the tip slightly to the left of the lumbar spine or before advancement up the ALV
- A marked posterior deviation of the catheter at L4–5 through S1 on lateral view (A catheter deviating posteriorly may be in the ALV, whereas a catheter presenting anterior to the spinal column on lateral x-ray is typically in the IVC.)
- Vertebral and paravertebral venous plexuses filled by contrast injection into the ALV

marily on the left, most likely because the angle of ALV entry to the right common iliac vein is greater on that side. A right-sided entrance will decrease the risk of catheter malposition.

References

股靜脈導管錯位至升腰靜脈

龔昱中1  李昭賢1,2  吳健樑1,2

股靜脈導管被認為是一個快速和安全的靜脈通路。我們的報告描述一個股靜脈導管錯位至升腰靜脈之病人，而這種錯位可發生嚴重的併發症如血管穿孔，損害硬膜外或蛛網膜下腔，脊髓損傷，化學性腦膜炎，粘黏，癲癇，休克，四肢麻痹，衰竭，和尿瀦留。臨床醫生應該注意到股靜脈導管可能錯位至升腰靜脈，特別是在左側置入股靜脈導管時，可能是因為升腰靜脈到左側髂總靜脈的夾角較小。股靜脈導管錯位至升腰靜脈除可根據導管置入時之情況及放射影像診斷，亦可使用靜脈造影、即時螢光透視、超音波或腹部電腦斷層掃描確認。

關鍵詞：升腰靜脈，中央靜脈導管置放