Neuroimaging Highlight

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Intracardiac Migration of a Ventriculoperitoneal Shunt

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Catheter migration is a rare complication of cerebrospinal fluid shunts. Classically, case reports have described various migrations and extrusions in different clinical situations.[1] Among them, intracardiac and intravascular migrations are particularly rare and imply specific therapeutic considerations.

Case Report

We report the case of a 56-year-old woman who developed hydrocephalus after surgical resection of a posterior fossa epidermoid cyst. A ventriculoperitoneal shunt was uneventfully placed, with tunnelling performed in a head-to-abdomen direction. The patient remained asymptomatic for ten months, after which she complained of persistent cough. Chest X-rays showed migration of the distal catheter to the thoracic cavity. A chest computed tomogram (CT) scan demonstrated that the catheter entered and exited the heart through the major thoracic vessels (Figure). One-stage endovascular retrieval of the catheter (via the femoral vein) and conversion to a ventriculoatrial shunt (from a neck incision) were performed. The patient remained asymptomatic afterwards.

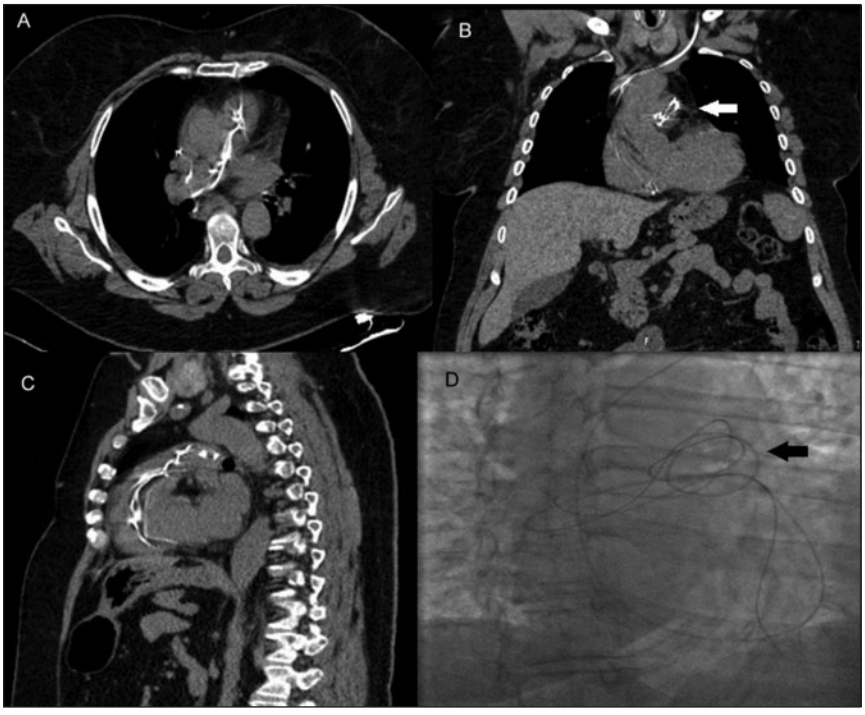

Figure: *(A) axial, (B) coronal and (C) sagittal chest CT-scan, (D) intraoperative fluoroscopy. Distal catheter of the shunt enters and exits the heart through the great vessels of the thorax. Tangling of the tube around the heart valves is also visible (white arrow on image B and black arrow on image D).*

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Discussion

Intracardiac-intravascular migration is a rare complication of shunt diversion surgery. It is caused by asymptomatic perforation of the jugular vein, either by unnoticed violation of the vessel during shunt implantation or by chronic erosion of the vessel by the catheter with breathing movements.[2,3] When the vessel wall is thus perforated, the negative pressure inside the vein would take the catheter into the intravascular space. To prevent this complication, excessively deep tunnelling of the distal catheter in the neck should be avoided.[2,3] Recommendations regarding tunnelling direction (cranial-to-caudal or caudal-to-cranial) are not available, since direction has not been systematically described in reports of complications. Risk of embolic complications and indication of antiplatelet prophylaxis is not known, and the scarce information available is derived from experience with pace-makers.[4] Almost all authors that have reported intracardiac-intravascular shunt migrations have retrieved the migrated catheter. This can be attempted by proximal pulling from a neck incision, under fluoroscopic guidance, but this manoeuvre has been reported to cause cardiac arrhythmias, or to find the catheter knotted or tangled in the heart valves.[5] In such instances, endovascular retrieval of the catheter (with different snare catheters, balloons and techniques) is recommended.[1-3]

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