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If the ventriculoatrial shunt disappears

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Abstract

The Seldinger procedure is used to place the distal catheter of a medical device called a ventriculoatrial shunt into the internal jugular vein to treat chronic hydrocephalus. We present the case of a 40-year-old man who, 3 years after the distal catheter's implantation, experienced disconnection and migration in the pulmonary arteries, which was discovered by the recurrence of Hakim-Adams syndrome. A pigtail catheter and lasso snare retrieval device were used in an endovascular operation to quickly remove the migrated catheter. The placement of a contralateral ventriculoperitoneal shunt was beneficial for the patient. The patient's case serves as a reminder that, in the absence of cardiac or pulmonary issues, interventional radiology should be sought to remove migrating endovascular foreign material.

Keywords : Interventional radiology, Ventriculoatrial shunt, Migrated distal catheter, Endovascular procedure

INTRODUCTION

In the past two months, a 40-year-old man who had previously experienced a subarachnoid haemorrhage (SAH) from an aneurysm rupture worsened by chronic hydrocephalus and treated with a ventriculoperitoneal shunt (VPS) presented to the emergency room. He had revision surgery with the installation of a ventriculoatrial shunt three years ago (VAS).

CASE REPORT

The patient was afebrile, and a clinical examination revealed no meningismus or localised neurologic abnormalities. A recurrence of persistent hydrocephalus was discovered during a computed tomography (CT) scan of the head. The catheter had separated from the valve and moved through the right heart chambers in the pulmonary arteries, according to a cervicothoracic CT image. The patient denied having dyspnea and chest pain. Auscultation of the heart was normal. WBC 8.6G/L, CRP 0.9 mg/L, and D-dimer 0.36 g/mL blood tests showed no evidence of infection or pulmonary embolism, respectively.The patient was brought to the interventional radiology suite a day after being admitted. Through the right femoral venous access, a 7F sheath (Radifocus Terumo®, Somerset, NJ 08873 USA) was implanted.In order to catheterize the right heart and reach the pulmonary arteries, a 5F pigtail catheter (Radifocus Terumo®) was inserted through a 0.035 guidewire (Terumo®). The right inferior subsegmental artery was blocked by a migrating silicone shunt that had become looped. The loop was gradually undone, allowing the shunt's extremity to be released in the inferior vena cava. After the pigtail catheter was withdrawn, a 6F EN snare® lasso retrieval device (Merit Medical Inc., SouthThe migrating shunt was captured and removed using a device (Jordan, Utah 84095 USA).

The patient underwent revision surgery two weeks after being admitted, during which the residual proximal shunt was removed, and a contralateral frontal VPS shunt with an adjustable pressure valve was implanted. The patient's neurological condition significantly improved in the days after the operation. His recovery from surgery went without incident. After being admitted, he was released three weeks later.

DISCUSSION

SAH accounts for 17.4% of all chronic hydrocephalus cases. However, VPS has one of the highest rates of complications in neurosurgery (11-47%), including excessive CSF drainage, shunt blockage, infection, and gastrointestinal problems. VPS is the preferred treatment for chronic hydrocephalus. [1] Depending on the surgeon's experience or the circumstances, VAS can be done as a revision surgery or as the first-line treatment for chronic hydrocephalus. Infection, excessive drainage, autoimmune glomerulonephritis, and pulmonary embolism are among the post-operative complications that are associated with VAS at a rate of 43-50%. However, fewer shunt obstructions are reported compared to VPS.Using the Seldinger procedure, a VAS is a medical device that is introduced into the superior vena cava through the internal jugular vein. A very uncommon complication is thrombus development at its distal extremity. Even less common complications include migration of the distal catheter into the pulmonary arteries or the right heart chambers, which can be fatal. These complications have mostly been reported in children but have also occurred in adults when the distal catheter breaks. In our case report, we describe the migration of an intact distal catheter that had been detached from the valve three

years prior. Surgery should be avoided unless the migration of the catheter has caused cardiac or pulmonary damage. In that case, the catheter should be removed immediately using an endovascular technique. [4-6] Fifty years ago, the idea of minimally invasive endovascular retrieval of misplaced foreign material seemed unthinkable, but with to advancements in endovascular catheter technology and biplane imaging, it has quickly emerged as the preferred option.

We would advise revision surgery of the entire system in regards to the VAS. Additionally, we advise implanting shunts with a monobloc valve-distal shunt system or sealing the junction between the valve and the catheter with a tight suture to prevent disconnection and migration of the distal catheter. The valve should be positioned so that it rests directly on the convexity of the skull by placing the ventricular catheter in the frontal horn of the lateral ventricle as opposed to behind the ear, where frequent neck movements could cause the shunt to disconnect. This idea is relevant to both VAS and VPS.

CONCLUSION

Together, neurosurgeons and interventional radiologists frequently treat patients who have experienced aneurysm rupture, for instance. In the event of unanticipated difficulties, such as endovascular VAS catheter migration, this partnership is advantageous for an interdisciplinary approach.Indeed, in contemporary medicine, the removal of migrating endovascular material should always be done using minimally invasive methods.

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