Case Report

Delayed cardiac migration of totally implantable central venous access catheter

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ABSTRACT

Chemo ports (or totally implantable venous devices) are increasingly being used for venous access for chemotherapy in cancer patients, especially in the pediatric age group. They improve the quality of life of children requiring long-term chemotherapy. Despite the advances made in the design, material of the catheter and the technique of insertion, various complications are associated with their use. Cardiac embolization of such a catheter is a life-threatening complication. We report, cardiac migration of a chemo port catheter 6 months post-insertion and discuss the diagnosis and management of this rare complication.

Key words: Cardiac migration, complications of implantable venous device, totally implantable venous access device

INTRODUCTION

The introduction of implantable venous devices has revolutionized the care and quality of life of patients with cancer. Implantable port consists of a single lumen (or double lumen) reservoir hub attached to a catheter. The reservoir hub is implanted in the subcutaneous tissue of the chest wall and catheter tunneled to the accessed vein. The distal end is positioned in the superior vena cava, whereas the proximal end is connected to the port reservoir. These totally implantable ports offer several advantages over partially implantable systems: Low infection rates and unrestricted freedom in patients' physical activities.[1,2] Device-associated complications include infection, catheter obstruction and deep venous thrombosis are well-described. In the present case, we discuss an infrequent, but serious non-infectious complication associated with totally implantable devices. 6 months after insertion, the whole catheter migrated spontaneously into the right ventricle.

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CASE REPORT

The present case report is about a 2-year-8-month-old female child diagnosed with left adrenal neuroblastoma stage IV underwent chemo port placement [Figure 1]. Districath implantable port axial into right internal jugular vein by a percutaneous technique. Catheter position was confirmed radiologically post insertion. She then received 10 courses of chemotherapy through the chemo port without any complications. During the 11th course of chemotherapy, there was no backflow of blood on reservoir chamber aspiration and a subcutaneous swelling developed at chemo port site on flushing. X-ray chest [Figure 2] revealed migration of the whole catheter into cardiac chamber. The catheter was retrieved from the right ventricle [Figure 3] with the help of a goose neck snare introduced via right subclavian vein under fluoroscopic guidance (by an interventional cardiologist). Right femoral vein access failed due to thrombosis. The infusion chamber was also removed and the child later underwent another chemo port placement for further chemotherapy.

DISCUSSION

Chemo ports (totally implantable devices) are widely used world-wide for pediatric oncology patients requiring long term chemotherapy. The complications with implantable devices are least compared with other central venous

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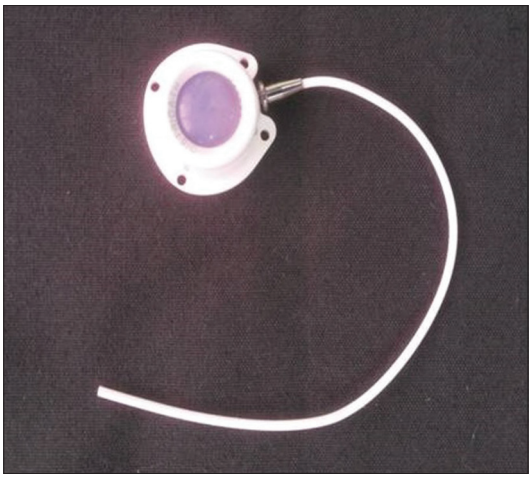

Figure 1: Totally implantable venous access device. Showing port chamber with tubing attached via metallic connector

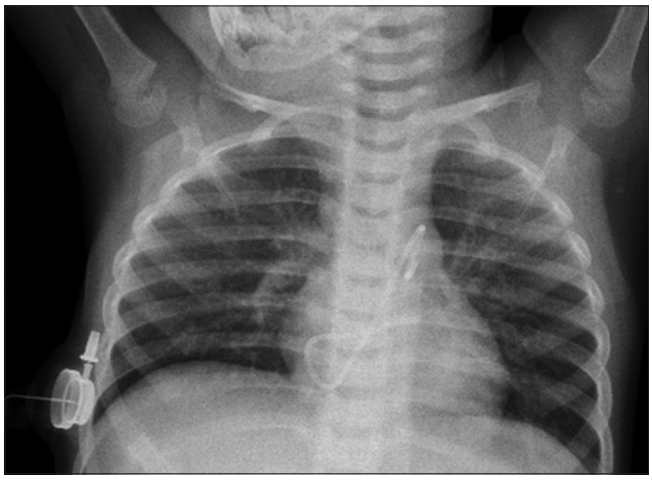

Figure 2: Migrated, detached whole catheter in cardiac chamber and infusion chamber with a metallic hub on the right chest wall

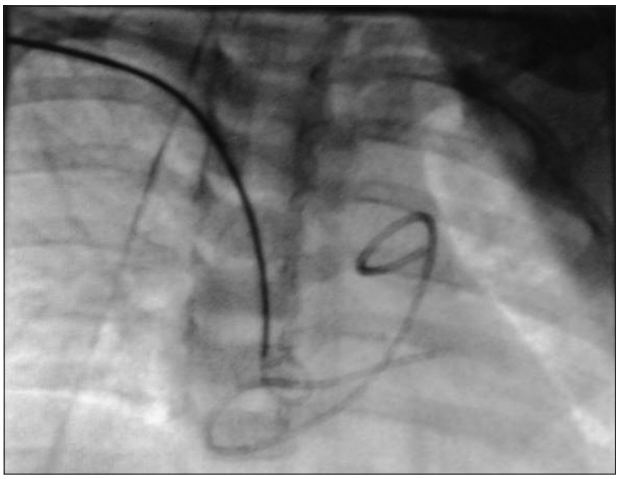

Figure 3: Retrieval of the catheter under fluoroscopic guidance with the help of a vascular snare via the subclavian vein (percutaneous technique)

access methods. The complications can be classified as early and late. Early complications include hematoma, arterial puncture or injury, venous rupture, hydrothorax, hemothorax, chylothorax, pneumothorax, air embolism, malpositioning and catheter breakage that results in its migration. Late complications include catheter-related infection, catheter occlusions or thrombosis, catheter fracture and migration.[3,4] Migrations happen less than initial malpositionings.[5] Catheter fracture and dislocation is an uncommon but life-threatening complication with an estimated rate of 0.1%.[6] Trotter reported an incidence of 2.5% over a 5 years period in neonates.[7] The embolized catheter fragment may travel to the right atrium, ventricle, or even into the pulmonary artery. Perforation of caval vein and migration of the catheter tip into the lung or mediastinal structures has also been observed.[8] Different mechanisms that lead to fracture and migration of the catheter have been described and include shearing by the introducer needle during insertion, bolus infusion, body movements, weakening of the catheter tip and mechanical compression between clavicle and the first rib.[5,7]

In the index case, catheter migration was spontaneous as no plausible cause can be asserted. Blood aspiration and saline injection are standard safety tests to be undertaken before administration of drugs. Local pain or subcutaneous swelling at the site of port flushing are signs of malfunction or malposition and should be investigated. Rarely, it may present as an intracardiac foreign body with fever and/or arrhythmias. A catheter fragment in the heart may remain asymptomatic for years.[9] Percutaneous retrieval methods through a femoral vein or subclavian vein approach, using vascular snares are usually suitable and successful for most patients. Nevertheless, a catheter embedded in the myocardium may need a thoracotomy or median sternotomy for removal.[10]

CONCLUSION

Catheter migration is a rare but life-threatening complication of implantable venous access devices. Intracardiac migration may remain asymptomatic or may cause arrhythmia and cardiac arrest, hence should be considered as emergency once diagnosed. The catheter can be retrieved mostly by percutaneous technique with the help of a vascular snare, but may sometimes require an open sternotomy/thoracotomy. The importance of aspiration and saline flushing before any drug administration through ports cannot be overemphasized. Lastly, any implanted catheter should be removed once its purpose is fulfilled.

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