Percutaneous Endovascular Retrieval of Intravenous Catheter Fragment

Rajiv Lakhotia, Shivprakash, Vijay Sai, Shio Priye, Durgaprasad Reddy, Amit Kiran

1Chief Consultant, Associate Professor, Department of Cardiac Anaesthesia, Vydehi Institute of Medical Sciences and Research Centre Bengaluru, Karnataka, India
2Junior Consultant, Department of Cardiac Anaesthesia, Vydehi Institute of Medical Sciences and Research Centre Bengaluru, Karnataka, India
3Consultant, Department of Cardiology, Vydehi Institute of Medical Sciences and Research Centre Bengaluru, Karnataka, India
4Consultant, Assistant Professor, Department of Cardiac Anaesthesia, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru, Karnataka, India
5Chief Consultant, Associate Professor, CVTS, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru, Karnataka, India
6Junior Consultant, Assistant Professor, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru, Karnataka, India

Correspondence: Rajiv Lakhotia, B-5, VIMS Campus, #82, EPIP Area, Whitefield, Bengaluru, Karnataka, India Phone: 919343454161, 918028413596, Fax: 918028412956, e-mail: rajvlakhotia2004@yahoo.com

ABSTRACT
Central venous access is an increasingly frequent procedure and intravenous catheter fractures and fragments embolisation, although being rare, corresponds to common intravascular foreign bodies with potential catastrophes especially in patients with congenital heart defects. A case report is presented with a fracture migration of venous catheter, its endovascular retrieval and suggestions to reduce the incidence of this complication.

Keywords: Vascular access catheter, Foreign bodies, Fracture, Embolism.

CASE REPORT
A 6-year-old female child was admitted with diagnosis of large proximal muscular ventricular septal defect (VSD) and severe pulmonary hypertension. She was operated upon for VSD closure under standard protocol of anaesthesia and cardiopulmonary bypass. For perioperative management, she received one 20 G catheter insertion in antecubital vein of right forearm, 5 Fr triple lumen 8 cm catheter was inserted in right internal jugular vein, right femoral artery was cannulated with 22 G arterial cannula using Seldinger’s technique and one 18 G intravenous catheter 2.5 inches long was inserted in left femoral vein and a purse string taken with 2-0 silk thread for securing the catheter to the site.

In the immediate postoperative period in the intensive care unit, it was observed that there was significant swelling in the left groin area. Fluid administration through left femoral catheter was discontinued, line disconnected and dressing removed for local inspection. Fluid extravasation was observed from the puncture site and on close inspection, it was noted that the catheter was completely sheared and ‘cut-through’, and was not visible. Only the proximal stub connected to the 10 cm 3-way extension tubing was holding on to the plaster.

The intubated and ventilated patient was then shifted to the cardiac cath-lab, where under fluoroscopy the ‘missing’ distal portion of the venous catheter was found to have migrated proximally. The silhouette revealed that catheter was lying in the left common iliac vein in the abdomino-pelvic area (Fig.1 and Fig. 2). It was planned to retrieve the catheter employing endovascular technique under fluoroscopy.

Fig. 1: The fractured and migrated catheter revealed in left common iliac vein (blue arrow)
A 6 FR paediatric sheath was inserted in right femoral vein. After adequate heparinization through it, 6 FR right coronary artery (RCA) catheter was introduced and guided towards the left iliac vein under fluoroscopy. A 3 FR microloop snare was threaded through the catheter and while screening under fluoroscopy, the venous catheter was engaged and snared (Fig. 3). It was then pulled out along with the RCA catheter successfully in one piece (Fig. 4).

Patient remained stable haemodynamically throughout the procedure and was weaned from ICU care without any further events.

DISCUSSION

Fracture of central venous access catheter is although rare, yet can be associated with serious complications like thromboembolism, sepsis, cardiac arrhythmia, pericardial effusion, myocardial lesion and bacterial endocarditis. Unretrieved intravascular foreign bodies may cause severe or life-threatening complications in up to 71% of patients, with mortality ranging between 34 and 60%. The percutaneous retrieval of intravascular foreign bodies is a relatively simple process, as compared to the surgery and has proven to be a safe and effective procedure. The loop snare is being recognised as the most effective and preferred device for the atraumatic removal of these fragments. The loop is at a right angle to the catheter (90°) and there is an array of snares sizes for an ideal adjustment to the vessel. Most commonly fractured catheters get lodged at the right atrium, the superior vena cava and the left pulmonary artery. Purse string sutures are commonly taken around the central venous or arterial cannula to secure at the insertion site.

In our patient, the venous cannula probably got cut through either by the needle passed subcutaneously during fixation or was sheared by the tight knot of the silk suture along with the skin. It can easily result in the fracture—displacement of the cannula leading to migration towards the heart along with the venous return flow.

Fortunately, the problem was detected before its migration into right atrium or right ventricle or the pulmonary circulation. Though left to right shunt was present across the VSD, but due to large size of the defect and consequent small gradient of 10 mm Hg, the potential of migration of the foreign body (fractured cannula) across the VSD to the left circulation existed, which could have had very sinister consequences like stroke.

CONCLUSION

The high rate of success and the low rate of complications render the percutaneous endovascular techniques as the preferred method of intravascular foreign body extraction, whenever
possible. This case highlights the importance of the care, which needs to be taken while securing the catheters whenever purse string sutures are taken. Immediate proximity of the suture-bites to the catheter should be avoided to decrease the potential of “cut-through” of the catheter, and too much of tightening of the purse-suture should also be avoided.

REFERENCES


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