CASE REPORT

Safe retrieval of impacted central venous line

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Embolisation of impacted central venous lines is not uncommon in paediatric practice. We describe a method of preventing this complication and associated risks.

Central venous access is increasingly being used for the long term administration of intravenous medications as well as for hyperalimentation. Impaction, fracture, and embolisation of these lines are not uncommon in a tertiary care paediatric set up. We describe a method of successful retrieval of an impacted central venous line after failed attempts at external traction under general anaesthesia.

CASE REPORT

An 8 year old girl had been diagnosed with acute lymphoblastic leukaemia at 5 years of age. Chemotherapy according to a modified MRC protocol was commenced after obtaining central venous access by inserting a 14 gauge Leadercath percutaneously into the left subclavian vein and advancing it into the right atrium. Externally, this was tunnelled into the left axilla 4 cm from the incision site. She had recurrent episodes of febrile neutropenia during chemotherapy and later developed inflammation around the line insertion site, requiring antibiotic treatment.

On completion of successful chemotherapy, attempts to remove the catheter by moderate traction under general anaesthesia were unsuccessful, though the catheter tip moved from the right atrium into the left innominate vein (fig 1). Paediatric cardiologist intervention was sought at this juncture.

The method employed for retrieval was as follows. Central venous access was obtained by the Seldinger technique and a seven French Cordis sheath was secured in the right femoral vein. After taking aseptic precautions, including cleaning the venous line with antiseptics and administering prophylactic antibiotics, a 018 coronary guide wire was introduced through the impacted central venous catheter into the right atrium. Using a 10 mm Gooseneck snare (Microvena) the wire tip was exteriorised through the right femoral venous sheath, thereby securing the impacted line from embolisation. Moderate to hard external tugging was then applied to release the line from the impacted position. As this failed, the line was cut flush with the skin around the coronary wire, while maintaining traction to prevent the exteriorised line segment from retracting into the vein. The gooseneck snare and catheter were then advanced over the coronary guide wire through the femoral sheath. The tip of the venous line was snared over the wire by advancing the sheath. The wire and central line were exteriorised through the femoral venous sheath and removed successfully without complications.

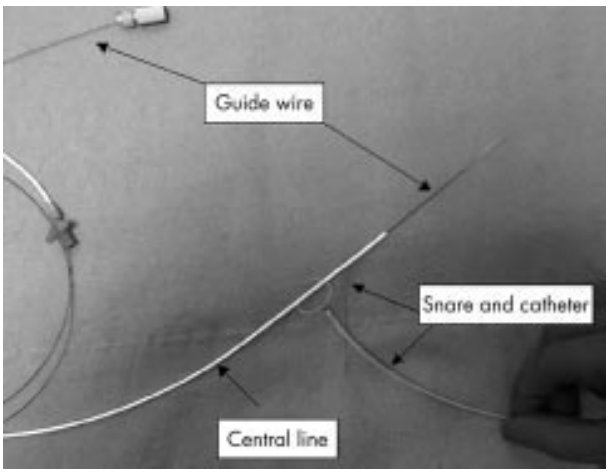

Figure 1 Equipment used for safe retrieval of the impacted line.

The retrieved catheter bit was coated with a thin fibrinous membrane, which was probably causing restriction to the movement of the catheter as it got crumbled between the clavicle and the first rib as visualised on fluoroscopy during external traction. There was no bleeding or haematoma in the immediate vicinity of the tunnel, the procedure taking less than 15 minutes with minimal fluoroscopy time and radiation exposure.

DISCUSSION

Central venous lines are commonly used for the delivery of nutrients and medications, through the percutaneous route or under direct vision by surgical exploration.[1] These are used increasingly in oncology and cystic fibrosis patients, short gut syndromes, and cardiac patients needing prolonged intravenous support. Spontaneous fracture and embolisation of the catheter is a rare complication.

Impending line fracture may be detected by the "pinch-off sign" on a chest radiograph.[2] Catheter pinch-off is caused by friction of the catheter between the clavicle and the first rib. The incidence of this rare complication is estimated at 0.1–1%. The incidence of catheter pinch-off may be reduced by a lateral insertion technique and radiographic monitoring after implantation.[3] Catheter fractures are primarily related to tearing of the catheter during insertion or traction on the catheter-hub junction, in one study occurring in up to 9.7%.[4] Other complications are infection, central venous thrombosis,[1] and phlebitis (9.7%). Embolisation of the fractured segment of central venous catheter into the pulmonary artery has also been reported.[3]

A cardiologist's services are often requested to retrieve fractured and embolised central venous catheter segments. In our institution about one or two embolised central lines are retrieved annually by emergency catheter intervention. The usual clinical setting involves patients who undergo long term antibiotic, chemo, or nutritional therapy who have had their central line removal attempted by traction, resulting in the avulsion of the proximal segment and embolisation into one of the cardiac chambers or pulmonary arteries.

Implications of such a setting are grave, with the potential for seriousbacteraemia, myocardial damage, arrhythmia, pulmonary embolism, and infarction on top of the inherent dangers of an invasive procedure of catheter intervention and radiation.

In our patient, the oncology and paediatric surgical team opted to avail cardiologist intervention after moderate attempts to remove the central venous line by traction failed. Considering the need for emergency intervention with associated risks and potential for catheter fracture and embolisation if more aggressive attempts were made for the line removal, we opted for an elective extraction of the impacted line. We advocate this technique in all patients in this situation, as it is elective, controlled, and safe with reduced risk of intervention and radiation. The risk of infection is minimised with proper aseptic technique and antibiotic prophylaxis. This approach in preventing embolisation of impacted central venous line is not reported as most often intervention is requested after embolisation.

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IMAGES IN PAEDIATRICS

Technetium-99m MDP bone scintigraphy shows multiple abnormalities in sickle cell disease

Bone scintigraphy was performed on an 11 year old boy with known sickle cell disease who presented with severe right hip pain. Images showed features of avascular necrosis of the right femoral head. In addition, there was increased accumulation of the ^{99m}Tc MDP in the ends of the long bones at the knees, and diffuse activity was observed in the enlarged spleen and the kidneys.

The diffuse soft tissue uptake in the enlarged spleen has been attributed to microscopic splenic calcification and/or iron deposits, both of which may occur as a result of repetitive infarcts.[1] Diffuse accumulation in the kidneys does not reflect clinically altered function but is related to microcalcification due to repeated vaso-occlusive episodes.[2]

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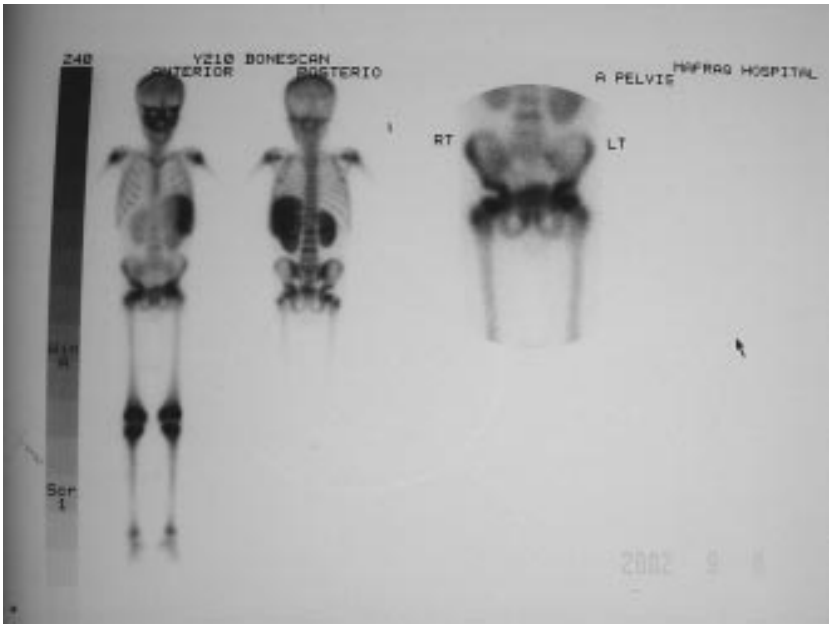

Bone scintigraphy shows a cold area in the right hip due an avascular necrosis. The concentration of activity around the knees is caused by the activation of red marrow with extension into the diaphyses and periarticular areas associated with chronic anaemia.