Introduction

There are various methods for gaining vascular access in infants and children. Central venous catheters (CVCs) are commonly used for short and long term venous access. In spite of the use of different guides to central venous catheterization like the ultrasound, ECG, real-time X ray imaging, catheter misplacements are still not uncommon. Apart from the guides being largely operator dependant, a large number of congenital and acquired abnormalities of the venous system lead to misplaced catheters.

Here we present a case with abnormal placement of the subclavian vein catheterization

Case Report

A 12 year female child was admitted for hepatic encephalopathy. At the time of admission she was conscious and responding to commands. Her total bilirubin was 15 mg/dL with an indirect fraction of 10 mg/dL). She was put on conservative management. Her sensorium rapidly deteriorated and she started throwing seizures and there was requirement for ionotropic support also. A triple-lumen CVC was inserted via right subclavian vein through the right infraclavicular route using Seldinger technique. The position was confirmed by adequate backflow of blood and free flow of saline. But when the check X ray chest revealed catheter tip was in the ipsilateral IJV. It was pulled back up to the 5-cm mark and replaced. Repeat X-ray chest was done to confirm the correct position.

DISCUSSION

Central venous catheterization is indicated for short- and long-term access and for various other reasons. Catheter can be inserted in internal jugular, subclavian or femoral vein. The preferred vein for CVCs is the right internal jugular vein (IJV) for its straight course to the right heart and the lowest risk of the venous stenosis and thrombosis. In children femoral vein is often chosen because for its easy accessibility. The incidence and occurrence of complications depend on various factors, such as the experience of the operator, the site of insertion, and the placement technique. Not only technical expertise but also awareness of the potential complications is very much essential while doing this procedure. Arterial puncture is one of the most common complications related to central venous catheterization. The serious consequences may be pneumothorax, uncontrollable bleeding leading to haemothorax or rupture of the thoracic duct.

The current recommendation is the tip of CVC should be positioned at the level of superior vena cava and the right atrium. This location ensures a high blood
flow which prevents thrombosis. As it lies outside the atrium the chances of arrhythmias from catheter tip irritation of the right atrial wall is negligible.[7] Malposition of a CVC means the catheter tip laying anywhere outside the SVC. Misplaced catheters can be of two types such as intra-cava malposition and extracava (mediastinum, pleura, pericardium, trachea, esophagus and other aberrant sites) malposition on the basis of the location of the catheter.8

Figure 2 : Superior medastinum vessels

There are various factors like defective method, anatomical variation, tortuous vein, acute angulations of vessels and few congenital anatomical variation which predispose to catheter misplacement.9,10,11 The guide wire plays a major role in the successful placement of the catheter.12,13 But unexpected kinking or excessive force imposed may land up in malpositioning of the same. Therefore, any resistance felt should raise suspicion of a problem, and further imaging will be required.

Localization of the vein by ultrasound and its guidance for the placement of needle, electrocardiographic guided catheter tip placement using NaHCO3-filled catheters, and immediate postprocedure X-rays have been proposed for aiding a safe placement of CVC.9,10 CVC insertion can best be guided by fixed bony point and accompanying palpable arteries, but it remains a blind procedure. This would always result in a chance of malpositioning the catheter.

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References