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Case Report

A Misplaced Central Venous Catheter

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Abstract: Even though the central venous cannulation of the subclavian vein is routinely used in anaesthesia, misplacement of the catheter is an inherent risk as usually it is a blind procedure. The role of check x-ray chest is invaluable to confirm correct positioning and to detect any complications. Here we present a rare case of misplacement of the central venous catheter into the contralateral subclavian-vein.
Keywords: Cannulation, Malpositioning, Complication, Insertion, Central Venous

INTRODUCTION

Central Venous Cannulations are now routinely used in the Intensive Care Units (ICU's), intra- operatively and in the emergency rooms. The most commonly used sites for the insertion of the central venous cannula (C.V.C) are the right subclavian - vein and the right internal jugular vein (IJV). Other less used routes are the brachiocephalic- vein and the femoral vein.

However placement of a CVC is not without complications like pneumothorax, hemothorax, injury to nearby structures and malpositioning. The reported incidence of malpositioning ranges from less than 1% to more than 60% [1]. The most common site where a CVC catheter gets misplaced is the ipsilateral IJV and rarely into the contralateral subclavian vein. Here we present a rare case where the CVC was malpositioned into the contralateral subclavian vein.

CASE REPORT

A 42 year old female ASA-1grade was posted for unilateral nephrectomy in our hospital. Just after induction of anaesthesia a triple lumen 15 cm, size 7F central venous catheter was inserted through the right subclavian vein using the Seldinger's technique under all aseptic precautions. Back flow was checked and since from one of the ports there was no back flow of blood the catheter was pulled out a bit and the central line was secured and taped. Post operatively a check chest x- ray was done which revealed that the central line catheter tip was in the left subclavian vein. The fluid infusion was stopped immediately and the catheter was removed.

Fig 1: Misplacent of CVC into contralateral subclavian vein

DISCUSSION

Central venous catheters are inserted for measuring and monitoring the CVP, administering drugs and fluids, aspiration of air emboli, inserting transcutaneous pacing leads and gaining access in patients with poor peripheral veins. Central venous cannulations are not without inherent risks which include infection ,air or thrombus embolism, arrhythmias , hematoma , pnemothorax , hemothorax,

hydrothrorax , chylothorax , cardiac perforation, cardiac tamponade, trauma to nerves, arteritis, thrombosis and malpositioning or malplacement.

The subclavian vein is the most commonly used vein for cannulation because it is a large vessel (20 mm in diameter) and is prevented from collapsing by its surrounding structures [2]. The catheter passes from the right subclavian vein through the right brachiocephalic vein into the superior vena cava. Ideally the central vein catheter tip end should be at the junction of SVC and right atrium for accurate CVP measurement [3]. Malpositioning of the catheter is a well known complication of Central Venous Catheterization [4]. Iovino *et al.;* found the rate of misplacement to be 1.8% both in the IJV site and the subclavian vein site [5]. Whereas Ruesch S *et al.;* reported misplacement rate of 5.3% in the IJV site and 9.3% in the subclavian site [6]. The various sites where the central venous catheter gets misplaced are ipsilateral IJV (commonest), the contralateral subclavian vein (most unusual), left internal mammary vein, azygous vein, hemi-azygous vein, lateral thoracic vein, inferior thyroid vein, left superior inter costal vein, thymic vein, pleural cavity and the jugular foramen [7]. In our case the guide wire passed through the right brachiocephalic vein into the contralateral subclavian vein instead of the superior vena. The various complications of misplacement include thrombophlebitis, infection, catheter erosion and erroneous measurement of the CVP.

The various causes for misplacement are the change in direction of J tip of the guide wire during insertion [8]), movement of the catheter tip with changes in head and neck position upto 3 cm towards the heart , poor fixation of CVC or due to manipulation by the patient, Twiddler's syndrome [9].

To check the correct placement of the CVC, a check x-ray chest should be done in all cases. Also the IJV occlusion test should be done in which a firm pressure is applied on the ipsilateral IJV in supraclavicular region for 5-10 seconds. Any rise in the CVP value above the baseline means the catheter tip has entered the ipsilateral IJV as occluding the IJV impedes the venous return and raises the CVP distal to the occlusion. If no change in the CVP occurs, the misplacement can be safely excluded [10]. In this case we did not use this test.

USG guided CVC insertion can be done to improve the success rate but some authors have reported that USG guidance had no effect on the rate of complications or failure of subclavian catheterization [11]. Endo cavitary Electrocardiographic system can also be used for correct insertion of the catheter [12].

CONCLUSION

In conclusion, blood should be aspirated from all the three ports of CVC and a check chest x-ray should be done in all the cases to confirm the position of the catheter tip and it remains the gold standard to detect misplacement of the catheter [13] as newer methods for detection of misplacements are not routinely available in all the hospitals.

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