

A Rare Malposition of Central Venous Catheter Inserted Through Internal Jugular Vein

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Abstract: Central venous cannulation is routinely carried out by anaesthesiologist in ICU as well as OR setup. Definitely it requires expertise for proper placement of a CVC, but malposition of a CVC inserted by blind technique is not rare.

Keywords: Central Venous Cannulation, Internal Jugular Vein, External Jugular Vein, Malposition.

INTRODUCTION

Ultrasound guided CVC insertion increases accuracy and minimizes complications^[1], but the routine practice of blind insertion technique continues at most centres due to the non-availability of ultrasound machine and lack of experience with USG guided insertion. Consequently, incidences of malpositioned CVC are quite common, and diagnosis is usually confirmed after a chest x-ray is performed. Here, a rare malposition of CVC inserted through the internal jugular vein (IJV) is reported.

CASE REPORT

A 50 year male patient underwent emergency laparotomy for perforation peritonitis and subsequently the patient was shifted to ICU in the postoperative period- since the patient was intubated for elective ventilation and was on vasopressor support. After the initiation of mechanical ventilation and initial fluid resuscitation with a peripheral line, central venous cannulation was planned through the right IJV.

After locating the right IJV with a finder needle, the vein was punctured with 18G needle and free aspiration of blood was obtained. A guide wire was inserted through the needle but it met with some resistance. On withdrawing the wire, its J-tip was found to be deformed. The J-tip deformity was manually corrected and the guide wire was reinserted, but it again met with some resistance. A fresh IJV puncture was done with 18G needle and the guide wire was re-inserted. This time the guide wire could be pushed, though with slight resistance. A 7 Fr triple lumen catheter was inserted and on aspiration free flow of blood was obtained from all the three ports. There was no haematoma/ swelling found near the site of puncture.

A check X-ray was performed [Figure-1] and it was found that CVC had taken a 180 degree turn and was suspected to have entered the external jugular vein (EJV) from IJV, probably through an anomalous communication between the two neck veins.

After that CVP values were not relied upon and no attempt was made to correct the position of the CVC. Dehydration was corrected by IV fluids through same CVC at the same position. Vasopressor was adjusted according to the NIBP value and tapered off over a period of 30 hours. Urine output was monitored throughout the post-operative period. Patient was weaned off from mechanical ventilator over the next 12 hours. CVC was removed and patient was shifted to post-operative ward on the fourth post-operative day.

Figure Legend:



Figure-1: X-Ray showing malposition of central venous catheter

Cases of malpositioned CVC are reported from ICUs worldwide. Different malpositions of CVC through right IJV insertion include entry into the ipsilateral subclavian vein, contralateral brachiocephalic vein, ipsilateral EJV, subarachnoid space and into the same vein after taking a U-turn within the lumen of vein.^[2,3]

The migration of CVC on IJV insertion to EJV through anomalous connection is probably a rare event if not the first of its kind. This was surprising since the least resistant path could have been to brachiocephalic vein or to subclavian vein. Instead the guide wire took a U- turn via an anomalous communication and entered EJV.

The possibility that CVC has bent and remained in the IJV itself was ruled out by the fact that the distance between tip and main stem of the catheter on X-ray was found to be 4 cm while the usual internal diameter of IJV varies from 0.5 to 2.2 cm only. The CVC could not have entered in the EJV through the subclavian vein as EJV drains into subclavian vein behind the clavicular head of sternocleidomastoid muscle (SCM). In our case the U-turn of CVC had not reached the clavicle instead it was 6cm above the clavicle.

The IJV is a continuation of sigmoid sinus and it emerges from the base of the skull through jugular foramen and enters the carotid sheath along with internal carotid artery. It then runs beneath the SCM and joins with subclavian vein to form brachiocephalic vein. The EJV is formed at the angle of mandible by the union of posterior auricular vein with retromandibular vein. It then courses obliquely across the anterior surface of SCM, pierces the deep fascia just posterior to SCM and drains into subclavian vein. But this vein is known to exhibit various anomalies in regard to its formation, course, communication and drainage.^[4] Standard anatomy textbooks do mention the fact that in upto one third of the cases (33%) EJV either communicates with IJV or drains into IJV^[5] and this fact cannot be overlooked while performing CVC insertion through IJV or EJV.

In conclusion, the guidewire of CVC should never be introduced forcefully into the vein. On the slightest resistance to its insertion, it should be withdrawn and free aspiration of blood should be reconfirmed with the syringe. A deformed guidewire should never be used and a new guidewire should be used in its place. A check X-ray is a must to know the correct position of the central line and to rule out pneumothorax. The use of ultrasound guided insertion may avoid the malposition in case there is an anomalous connection between major veins.

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