

Is Ultrasound Guidance Mandatory for Central Venous Access?

ABSTRACT

Conventional anatomical landmark method for central venous access for central lines or chemoport insertion is being replaced by ultrasound-guided technique in tertiary care hospitals. However, anatomical landmark method for central venous access should be a part of surgical training, as ultrasound and fluoroscopy are not available in the periphery and primary centers.

Key words: Anatomical landmark method, Central line access, Chemoport insertion, Ultrasound guidance

INTRODUCTION

Ultrasonography-guided introduction of central venous device is preferred method.^[1,2] However, most of the time in primary care center these devices are not available or medical personnel inserting central lines may not have sufficient experience to use ultrasound for central venous device insertion.

This discussion is on how safe is to insert central venous devices without ultrasonography.

CASE REPORT

In our observation, the right jugular vein access or left subclavian vein access for a right-handed person is easy and preferred. In the left jugular vein approach, guide wire can go to the left subclavian vein or right jugular vein. Similarly, in the right subclavian vein approach, guide wire can go to the right jugular vein or left subclavian vein. This can be redirected by C-arm and fluoroscopy. Hence, in cases, where C-arm and fluoroscopy are not available, it is better to take right jugular approach, which is in straight line with superior vena cava. The left subclavian approach is of second choice.

In the right jugular approach, patient's head and neck are extended. While in the left subclavian approach, extension should be avoided, as it narrows space between first rib and clavicle.

In the right jugular approach, the right carotid artery is palpated in mid cervical region. Number 24 needle mounted on 2 cc syringe is directed at 45° angle just lateral to carotid until venous blood is aspirated freely (Figure 1). Judgment of depth and direction of IJV is assessed. Guidance with 24 number needle avoids carotid hematoma. The main needle is directed in same way until venous blood aspirated freely (Figure 2). Care is taken that the tip of the needle does not cross the clavicle. This avoids pneumothorax and haemothorax.

Guide wire is inserted through the needle. Catheter position in superior vena cava is confirmed with C-arm and fluoroscopy.

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In subclavian approach, needle is introduced from mid clavicle region toward scalene triangle.

DISCUSSION

As per analysis of 152 chemoport insertions in period January 2019 to June 2022 at Bombay hospital, only two cases required guided introduction when clinical methods failed. Another analysis of 49 cases of chemoport insertion by anatomical landmark method done by senior resident in the thesis in year does not reveal any complication and none of these cases required guided intervention.

We do not deny superiority of ultrasonography guided central line or chemoport insertion. However, every resident after training period may have to do these procedures in primary care centers.^[3] When such devices are not available,



Figure 1: Small syringe and 24 number needle insertion



Figure 2: Main needle aspirating blood

clinical method is equally safe provided that the norms are followed. Hence, in the primary center, central line and chemoport can be introduced by anatomical landmark method. In our observation, large number of patients visit tertiary care center from interiors, for the lack of facility of putting central line and chemoport in primary care center. This can be avoided. Hence, this method has lot of economical bases also.^[2]

CONCLUSION

Right internal jugular vein is preferred access. Number 24 needle mounted on 2 cc syringe is used for guidance and to assess the depth and direction of IJV. Avoidance of crossing of clavicle while inserting main needle avoids hemothorax or pneumothorax.

The method that we have described is a safe method and it should be a part of surgical training.

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