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Usg Guided Transpectoral Axillary Vein Cannulation: A Feasible Option In Subclavian Artery Injury.

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ABSTRACT *The insertion of a central jugular or subclavian venous catheter in patients with injury or distorted anatomy can be challenging. Here, we present a case report of a central venous catheter inserted transpectorally using real time ultrasound guidance into the axillary vein in a case of subclavian artery injury with postburn contractures in the neck.*

KEYWORDS : Axillary vein, central venous catheter, Ultrasonography

Introduction:
Establishing a central venous catheter is often required in patients admitted to the intensive care unit either for vascular access, parenteral nutrition or monitoring of central venous pressure. However, blind insertion of a jugular or subclavian line in a patient with distorted anatomy can prove to be disastrous.

Even in routine cases the chances of creating a pneumothorax or haemothorax exist. Insertion of a femoral line comes with its own problems and difficulties like increased risk of deep vein thrombosis and high rates of colonization [1, 2] besides inability to measure central venous pressure.

In cases with subclavian artery injury, central catheter placement for measurement of central venous pressure is imperative to monitor the progress of the patient.

In all such cases, the ability to perform a real time ultrasound guided transpectoral axillary vein cannulation can prove to be an invaluable tool in the intensivist's arsenal.

Case History:
A 62 year old man presented with complaints of swellings in the left side of lower neck and upper chest since 2 years. He had suffered major burns to his neck and upper torso with a resultant post burn contracture of the skin.

A clinical diagnosis of lipoma was made and confirmed with histopathology and Ultrasonography. The swelling in the upper chest was deep to the pectoralis major while the neck swelling was about 27*30*35mm and extended 4cm deep from the skin surface. The jugular vein was 1 cm medial to the medial margin of the swelling while the left subclavian vessels were lying just posterior to it.

Surgical excision was performed but inadvertently the left subclavian artery was injured. An emergent repair with primary anastomosis was done after left clavicular osteotomy. The cephalic vein was injured as well and primarily repaired. The patient was then shifted to the surgical ICU.

Considering the delicate nature of the vascular anastamosis, the decision was taken to attempt a transpectoral axillary vein cannulation on the right side with real time ultrasound guidance.

The cannulation was a success and the patient was subsequently given total parenteral nutrition and fluid therapy until he was extubated and weaned off the ventilator.

Removal of the central line was also uneventful and did not cause any complications like bleeding, thrombosis or infection.

Discussion:
A direct percutaneous approach to the cannulation of the axillary vein may carry a risk of inadvertent injury to the axillary artery or the medial cutaneous nerve of the arm as it lies medial to the vein in the axilla. [3]

This problem can be overcome with the use of ultrasound guidance for cannulation. The axillary vein is the continuation of the basilic vein and extends from the lower border of teres major to the outer border of the first rib, where it continues as the subclavian vein. The axillary vein is crossed immediately anteriorly by pectoralis minor, which divides the vein topographically into three parts, namely proximal, posterior and distal to pectoralis minor.[4]

The problem faced during sonographic imaging of the subclavian vein is that it lies between the clavicle and the first rib. Also, the entire needle cannot be imaged with the probe facing medially. The axillary vein lies outside the thoracic cage and it can be visualized longitudinally, as opposed to the subclavian which is seen as a transverse section.

Although earlier data suggested that the valsalva manoeuver or Trendelenburg position increased the cross sectional area of the vein, recent reports say otherwise, with the cross sectional area increasing only with a 5 degree Trendelenburg tilt. [5]

A study published by Sharma et al in 2004 showed that USG guided axillary vein cannulation was successful in 196 out of 200 patients.

The axillary vein can be used, therefore, for central venous access in patients with distorted anatomy of the neck region or with injury to the subclavian vessels.

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