A rare case of variation in the anatomical relationship between the common carotid artery and the internal jugular vein due to enlarged thyroid

Sir,

Cannulation of the internal jugular vein (IJV) is a commonly performed percutaneous intervention to deliver medications including hyperosmolar drugs, intravenous fluids, parenteral nutrition, haemodialysis and for monitoring of haemodynamic variables. The IJV is a superficial and easily accessible structure. Ultrasound (US)-guided cannulation of IJV allows the user to predict variant anatomy and to assess the patency of a target vein. This results in lower technical failure rate, a reduction in complications and faster access as compared to landmark technique. However, anatomical variations in neck vessels may preclude easy cannulation.

A 64-year-old (95 kg, 165 cm) obese male patient arrived in the emergency department with altered sensorium following an episode of status epilepticus. On investigation, it was found that the patient had suffered subarachnoid haemorrhage due to rupture of anterior communicating artery aneurysm and thus was scheduled for clipping of the aneurysm. Concomitantly, the patient had gross thyromegaly with hypothyroidism that was controlled with medication. Ventilation and tracheal intubation were difficult as anticipated. During the ultrasound scanning of neck vessels in 30° left rotation of head, the IJV was found to be anteromedial to the common carotid artery (CCA) with a large thyroid tissue mass pushing CCA laterally. With the head in neutral position, the IJV lay anterior to CCA [Figure 1]. Thus, the IJV was cannulated in neutral position of head with the orientation of transducer probe perpendicular to the floor at the apex of the clavicle-sternocleidomastoid triangle.

A frequent complication of IJV access is the accidental injury of the CCA, which can be dangerous in some circumstances. In settings where US is not available, cannulation of IJV is done by conventional landmark technique based on the anatomical relationship of lateral position of the IJV with respect to CCA. However, anatomical variations between the two vessels...
may exist in an individual thus making it difficult to cannulate the IJV by landmark technique. We allowed 30° head rotation to the left side as per the results of a study conducted by Saitoh et al.[3] However, the IJV lay anteromedial to CCA in this position. This happened actually due to enlarged thyroid which further lateralised the CCA in 30° left rotation of head. In neutral head position, the IJV lay anterior to CCA and thus was cannulated with utmost attention by preventing injury to the posterior wall of IJV. Thyromegaly as a cause of this variation has not been previously described. Thus, it becomes imperative to use US for cannulating IJV during coexisting thyromegaly. Furthermore, the importance of cannulating IJV in neutral head position to improve success rate should also be taken into consideration.

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Conflicts of interest
There are no conflicts of interest.

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