

Malposition of Central Venous Catheter due to Radiation-Induced Venous Stenosis: A Report

Sir,

The article by Venugopal *et al.* made for an interesting reading and an informative case series.^[1] We agree with their conclusion that chest X-ray (CXR) is the gold standard and should be routinely practiced for identifying central venous catheter (CVC) malposition. We would like to report one such case in which we encountered malposition of CVC due to radiation-induced venous stenosis. After an extensive search, we did not find any case of radiation-induced CVC malposition reported. Radiotherapy (RT) may cause distortion of airway anatomy along with edema, swelling of the tissues, osteoradionecrosis, and stenosis or occlusion of the major vessels.^[2]

A 56-year-old female weighing 55 kg was admitted with the complaints of dysphagia and weight loss. She was diagnosed with carcinoma of the larynx, pharynx, with infiltration of the upper esophagus 8 months prior, and was posted for total pharyngo-laryngo-oesophagectomy. She had undergone 2 cycles of chemotherapy and 30 cycles of RT (45 Gy) for the same, with no relief of symptoms. The day before surgery, using the standard Seldinger technique with portable ultrasound (ACUSON, Siemens) guidance, the right subclavian vein (SV) was cannulated with 7 Fr triple-lumen central venous pressure catheter (arrow) under all aseptic precautions. All the three ports of CVC were aspirated for blood and fixed at 13 cm. CXR was done postinsertion to confirm the position of CVC, which revealed that the tip of the catheter was in the right internal jugular vein (IJV) [Figure 1]. The catheter was withdrawn and reinserted correctly through the right IJV.

Head-and-neck malignancy cases presenting for surgery, either primarily or subsequent to RT and chemotherapy, are common. RT has been extensively used as an adjuvant therapy

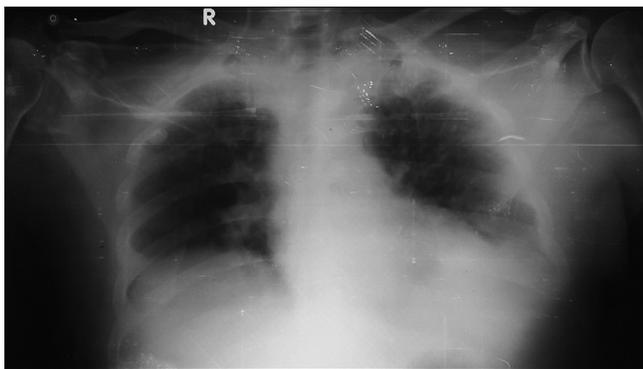


Figure 1: Chest X-ray showing central venous catheter inserted in the right subclavian vein, tip positioned in the right internal jugular vein

for malignancies. This case is unique as radiation-induced venous stenosis is extremely rare, and we found it only in a few published reports.^[3,4] We aim to report this case, although rare, but the possibility of radiation-induced venous stenosis which leads to malposition of CVC exists in patients with malignancies who had undergone multiple episodes of radiation. Aspiration of blood does not confirm the correct placement of CVC. Ultrasound (USG) decreases the failure rate, but USG can give localization of entry points of needle and guidewire position but not the catheter tip. It was found that the guidewire placed in the right SV proceeded along the right brachiocephalic vein (BCV) and then, instead of proceeding caudad toward the right atrium, turned toward the right IJV and, due to the stenosis at the left BCV [Figure 2], the tip of the guidewire deflected toward the right IJV. CVC cannulation by the right SV was associated with the highest risk of malposition (9.1%) than that of right IJV (1.4%). We kept the direction of the J-tip of the guidewire caudad to avoid the unusual pathway as we know that the direction of the J-tip of the guidewire may get deflected by an obstruction during its insertion and stenosis may contribute to the malposition of the CVC.^[5] We would like to concur with the authors that CVC insertion should be with electrocardiography monitoring guidance as it detects intracardiac placement quickly.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients



Figure 2: Digital subtraction angiography showing stenosis at the left brachiocephalic vein

understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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