

Needle in a haystack: Utilising point-of-care airway ultrasound for localisation of retained blade fragments post-emergency cricothyroidotomy

Dear Editor,

Emergency cricothyroidotomy is a guideline-advocated, potentially life-saving procedure.^[1] While its true incidence is unknown, retained foreign bodies post-airway procedures are a significant complication.^[2] We describe the role of point-of-care ultrasound (POCUS) for the airway in localising and aiding the retrieval of retained blade fragments post-emergency cricothyroidotomy.

A 55-year-old lady presented to a tertiary hospital with hypertensive intracranial bleeding. She underwent external ventricular drain insertion and

was eventually extubated. Post-extubation, the patient developed hypoxaemia and respiratory distress refractory to a high-flow, non-rebreather mask. The tracheal reintubation process was difficult and complicated by an episode of cardiac arrest secondary to severe hypoxaemia. Emergency cricothyroidotomy was performed synchronously with cardiopulmonary resuscitation efforts, and return of spontaneous circulation was achieved upon initiation of manual bag valve ventilation. During the 'stab-twist manoeuvre', the blade broke, causing two retained blade fragments [Figure 1a and b]. Shortly after stabilising the patient, the otorhinolaryngology team performed emergency open neck exploration under image intensifier guidance but was unsuccessful. The fragments were perceived to be located very posteriorly and close to the carotid and internal jugular vessels. Further complicating the procedure was that the position of the fragments in relation to these vital structures was not differentiated on image intensifier guidance, which only provided two-dimensional images. Urgent computed tomography (CT) of the neck revealed two blade fragments at the retropharyngeal region: one

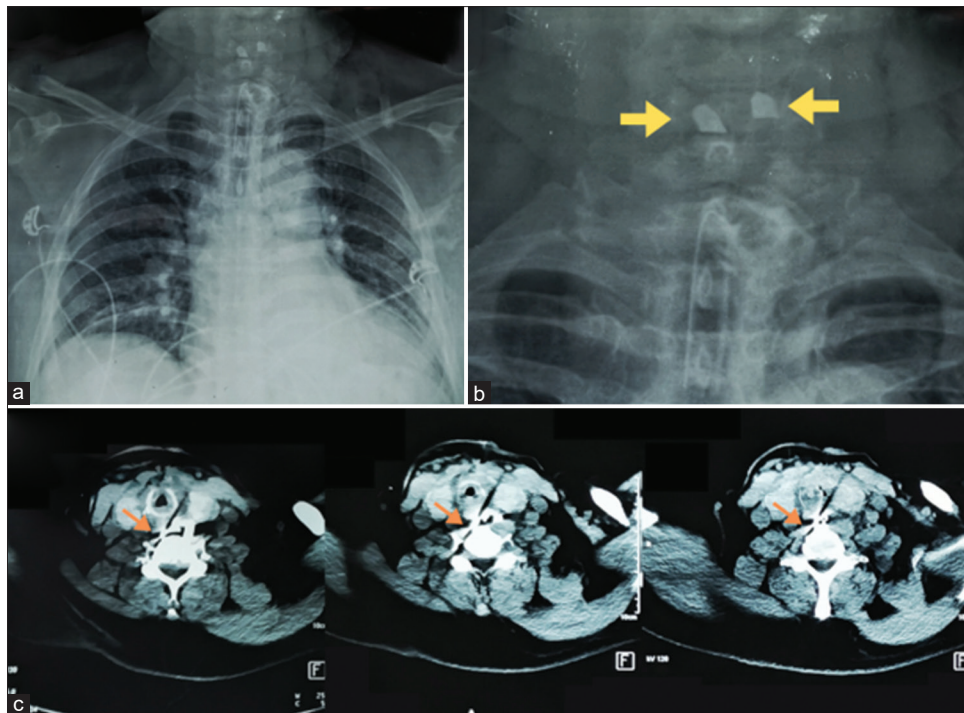


Figure 1: (a) Chest radiograph in anterior-posterior projection, (b) demonstrating two blade fragments in zoomed-in view (yellow arrows). (c) Computed tomography of the neck in axial view showing retained blade fragments (orange arrows)

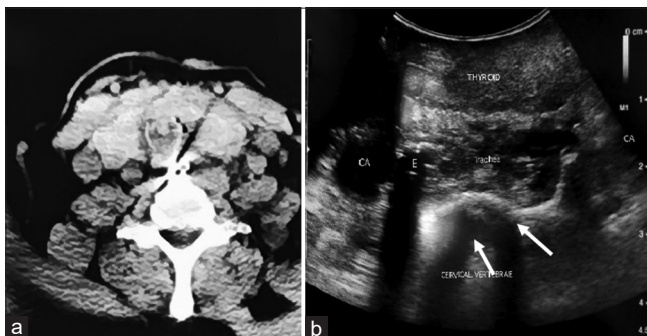


Figure 2: (a) Side-by-side comparison between computed tomography of the neck in axial view image and (b) corresponding sonographic image of the airway intraoperatively. White arrows show the posterior acoustic shadowing casted by the retained blade fragments. CA = carotid artery, E = oesophagus

was at the right anterior aspect of the C6 vertebrae, while another was visualised piercing the left C5/C6 anterior disc [Figure 1c]. After reviewing the CT images, the otorhinolaryngology team attempted a second open exploration. Initially, the blade fragments were challenging to locate, and there were concerns that further tissue dissection carried the risk of dislodging the blade fragments deeper into vital structures. At this critical juncture, the anaesthetist performed an on-table POCUS of airway to assess the blade fragments' depth, revealing two posterior acoustic shadows anterior to the cervical vertebrae [Figure 2b]. The relative positions of surrounding vital structures were also evaluated. As the anatomy

of the trachea and surrounding tissue was distorted due to local trauma, careful sonographic anatomical correlation was done with close communication between the anaesthetist performing POCUS and the surgeon, integrating existing radiological findings and the patient's actual anatomy [Figure 2]. The surgeon was thus able to confidently explore more posteriorly until the blade fragments were successfully identified anterior to the cervical vertebral column and were removed in full.

POCUS has been widely adopted in different specialities as it provides rapid diagnostic information, especially in emergencies.^[3] This case report highlights two important concepts in ultrasound imaging: posterior acoustic enhancement and shadowing.^[4] One advantage of upper airway ultrasonography over CT is the real-time visualisation of anatomical structures.^[5] One imaging modality that may have proved useful is fluoroscopy, given its ability to provide real-time imaging at the expense of radiation exposure. However, operator availability and clinician familiarity in fluoroscopic image interpretation are also important considerations, and to the authors' knowledge, fluoroscopy is not commonplace among otorhinolaryngology procedures.

Declaration of patient consent

The authors certify that they have obtained all

appropriate patient consent forms. In the form, the patient consented to her images and other clinical information being reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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