

Letter to the Editor

What the patients (and their radiological imaging) tell us: Two peculiar stories...

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To the editor,

Learning is a life-long process. This is particularly true in medicine where a keen eye and the desire to learn throughout a clinician's career determine and influence not only his or her clinical decision making but instill open-mindedness. Here we present two different yet educational clinical cases encountered by a junior anaesthetist in a District General Hospital.

Case 01

A 58-year-old, 60 kg, previously healthy male underwent an open midline laparotomy under general anaesthesia. The patient was positioned supine with the left upper limb adducted and kept by the side and the right upper limb abducted to a 90° position and pronated as the intravenous cannula was sited on that side. Following an uneventful surgery (duration-120 minutes) without further intraoperative positional changes, the patient's trachea was extubated once he was fully awake and he was sent to the post-anaesthesia care area for monitoring. He complained of severe pain to the nurse and became aggressive. The anaesthetic doctor was called and the patient was calmed down. His intraoperative analgesia included IV morphine 9 mg, IV paracetamol 1g, diclofenac sodium 100 mg as a suppository and an intraoperative bilateral transversus abdominis plane block by the surgeon. The unusual nature of pain despite multimodal analgesia was closely looked into. Another 1.5 mg of IV morphine was administered at which his pain was reduced. When inquired further, he pointed toward his right shoulder and stated that it cannot be moved. Immediate exposure and inspection led to the diagnosis of anteroinferior shoulder dislocation. The patient was reassured and taken back to the operating theatre immediately and reduction was achieved under sedation. Post reduction X-ray was satisfactory. There were no fractures. The patient later admitted that

he had recurrent dislocations on the same side. The abducted position probably had predisposed the dislocation in this instance. He was referred to the orthopaedic clinic for further follow-up. Figure 01 illustrates the dislocated shoulder.

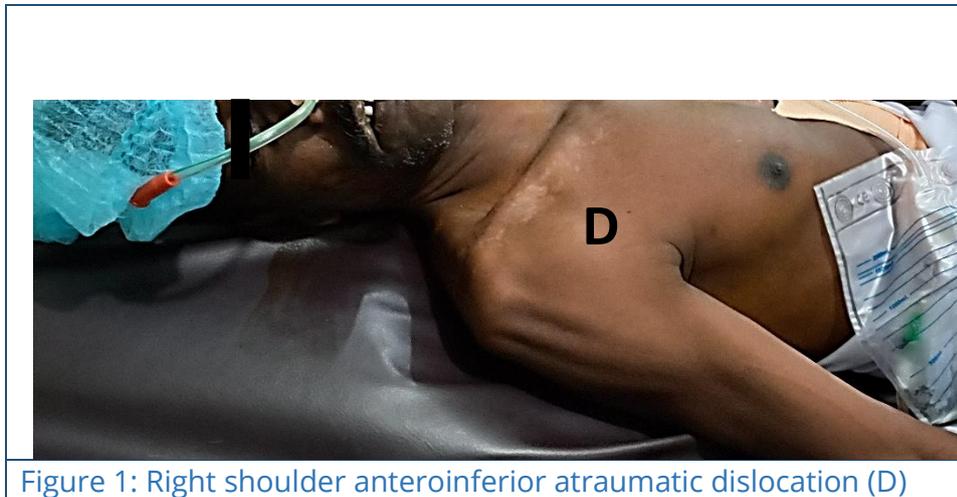


Figure 1: Right shoulder anteroinferior atraumatic dislocation (D)

Shoulder dislocations are common, amounting to 45% of all dislocations [1]. They are predominantly anterior and inferior, out of which 95% follow trauma [2]. The incidence of atraumatic anteroinferior dislocations, such events during anaesthesia and recurrent dislocations among the elderly are small [3]. Positioning during anaesthesia, especially abduction and external rotation of the upper limb, predisposes to anterior dislocations and muscle relaxation may play a synergistic role. Patients with recurrent dislocations undergoing surgeries should, therefore, be given extra attention and care during positioning, especially when they are under anaesthesia and when muscle relaxants are administered. Recurrent dislocations could be precipitated in patients with rheumatoid arthritis and should be taken into account during preoperative assessment. In cases of dislocations during the perioperative period, the anaesthetist should be able to identify the dislocation, seek orthopaedic opinion and monitor for complications such as axillary vascular injury and injury to brachial plexus which could lead to increased morbidity. Adequate analgesia is essential in patients with dislocations and intravenous anaesthesia, sedation, intra-articular analgesia and regional nerve blocks could be utilized for reduction of the dislocation. Proper briefing of patients is a necessity and documentation of such critical incidents is important.

Case 02

A 45-year-old male was admitted to the intensive care unit (ICU) for ventilatory support following respiratory failure subsequent to self-ingestion of organophosphate. He had been a heavy smoker despite no previous hospital admissions. In the emergency treatment unit, his trachea was intubated and a vasopressor commenced for unstable hemodynamics via a right external jugular cannula. The latter was replaced with a right subclavian central venous line inserted under ultrasound guidance. During his stay in the ICU, his peak airway pressure was noted to increase gradually. Examination of the chest revealed only a mild reduction in breath sounds in the left upper zone (LUZ) with no rhonchi in the lung fields. The trachea was central, and the vasopressor requirement was

static. A chest X -ray (CXR) was ordered which showed a pneumothorax on the left side (Figure 2a). An intercostal tube was inserted which confirmed the diagnosis. His airway pressure was reduced. The next day, the intercostal tube was functional with no bubbling; however, the breath sounds were still reduced in the LUZ with coarse crepitation. The endotracheal tube position was satisfactory. Tidal volumes were appropriate. An ultrasound examination of the chest was performed for diagnostic as well as teaching purposes. Interestingly, ultrasonic features suggestive of pneumothorax were still persistent. These included absent lung sliding and a 'sea-shore sign' in the M mode (Figure 2b). A repeat CXR showed rib crowding in the LUZ. Further analysis of the ultrasound study revealed an absent lung point (transitional area between a pneumothorax and normal pleura) and the presence of B lines. Considering both clinical examination findings and radiological data, it was concluded that an area of lung collapse exists in the LUZ without a pneumothorax. Regular chest physiotherapy, mucolytic therapy, and nebulization resulted in complete resolution. The patient was gradually weaned off, extubated and discharged to the ward.

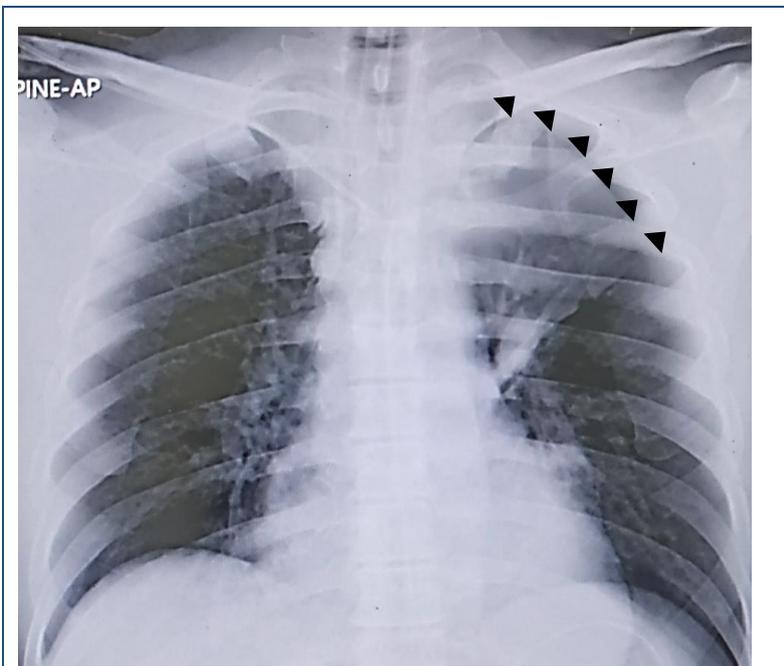


Figure 2a: Initial chest x -ray (anteroposterior view) illustrating left upper zone pneumothorax with visceral pleural line denoted in black triangles

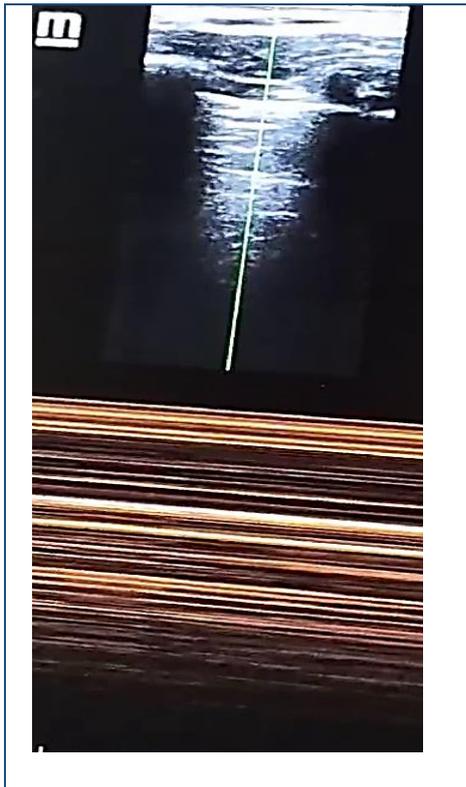


Figure 2b: M-mode using linear probe illustrating 'Bar code sign' (absent 'sea-shore sign) in the subsequent ultrasound scan of the chest

Lung ultrasound is a frequent accessory to the clinical examination, at present being considered as a 'third eye' to the attending clinicians [4]. Its many applications in emergency and critical care have been identified and utilized universally, demanding anaesthetists and intensivists to have expertise on the subject.

When visceral and parietal pleura slides during the respiratory cycle, a characteristic pattern appears on the B mode of the ultrasound called the 'marching ant' or 'grain of sand' appearance. This uniform pattern is lost when there is a pneumothorax resulting in a 'lung point' where a demarcation is identified on the point of pneumothorax and the region where pneumothorax is absent. This is considered diagnostic of pneumothorax in ultrasound. The M mode depicts a pattern called 'sea-shore sign in the normal lung where both pleurae move on top of each other. This is replaced by a 'barcode sign' (stratosphere sign) in pneumothorax. However, in contrast to the lung point, the former is not characteristic of pneumothorax. It is seen in other conditions where the two pleural layers are separated (pleural effusion) or when the pleural layers are not moving (pleurodesis, adhesions, one-lung ventilation etc.) [5]. In theory, lung collapse due to proximal small airway obstruction should also lead to absent lung sliding and a 'barcode pattern' in ultrasound without a 'lung point'. Thus, when interpreting ultrasound, the rest of the

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clinical and surrogate imaging modalities such as X ray should also be incorporated whenever doubts about the diagnosis exist.

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