Pneumothorax following ultrasound guided supraclavicular brachial plexus block

Sir,

Ultrasound is popular for the brachial plexus block, allowing real time visualization of the brachial plexus, pleura, blood vessels, needle and the local anesthetic spread.[1] Ultrasound guidance is the gold standard for the nerve blocks[2] and helps in detecting abnormal anatomy of the brachial plexus. [3]We report the occurrence of pneumothorax in a patient after administration of brachial plexus block under ultrasound guidance.

A 60 kg, 46-year-old man, a chronic smoker with chronic obstructive lung disease, suffered a fracture of the right radius. He was scheduled for open reduction and plate fixation, under the brachial plexus block. After initiating the monitoring and securing an 18G intravenous (IV) cannula, midazolam 1.5 mg was administered IV.

A 10 MHz, linear probe (Soneo, Kontron Medical, Plaisir, France) and a 22G, 4 cm stimulating needle were used for the brachial plexus block. Under all aseptic precautions, the probe was placed in the coronal oblique plane and the brachial plexus, first rib, sub clavian artery and the pleura identified in the supraclavicular area. The lateral to medial approach was used for insertion of the needle. Initially, the tip of the needle was not clearly visible. After adequate visualization, 25 mL of 0.25% Bupivacaine was injected into the sheath of the brachial plexus. The spread of the local anesthetic was observed during the injection.

After 10 minutes, the patient complained of dyspnea and became restless. The oxygen saturation decreased gradually from 98% to 78%. The air entry was decreased on the right side of the chest. After administration of oxygen via the ventimask, the oxygen saturation improved to 92%. The vitals remained stable during this period. A chest X-ray (CXR) anteroposterior (AP) view was taken revealed a right sided pneumothorax [Figure 1]. The chest wall to the lung margin distance was 2.5 cm. Under local anesthesia, chest tube was inserted in the second intercostal space and continuous air bubbles were seen in the fluid filled container. The oxygen saturation improved to 99%. The surgery was postponed and patient was shifted to the ICU for further management. Repeat CXR (AP view) confirmed the re-expansion of the lung with minimal residual pneumothorax. After two days, the chest tube was removed and the patient underwent the surgery under IV regional anesthesia.

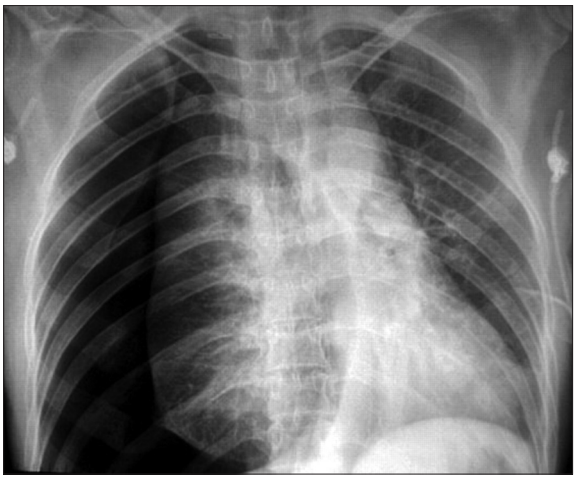

Figure 1: Right Pneumothotrax

In this case, pleural puncture probably occurred during the transient loss of visualization while advancing the needle initially. The tip of the needle was wrongly visualized by the anesthesiologist, although he was experienced with the use of ultrasound guided brachial plexus block. The tip of the needle was actually more distal than its appearance on the image, because of the improper alignment of the probe with the needle. This transient loss of visualization of the tip of the needle is a potential cause of error for the beginners.[4] A continuous visualization of the tip of the needle and proper alignment of probe with the needle must be ensured and in addition the needle should be slowly advanced towards the brachial plexus to avoid complications.

There is higher risk of pneumothorax in chronic obstructive lung disease.[5] Our patient was a chronic cigarette smoker and had chronic obstructive lung disease. In order to improve visualization of the tip of the needle, hydrolocalization using 5% dextrose can be used.[6] An ultrasound machine with needle visualization enhancing technology, is advocated.

To conclude, despite using the correct technique and latest devices like the ultrasound, while performing the brachial plexus block, one should keep a high index of suspicion of pneumothorax.

Kapil Gupta, Shyam Bhandari, Deepak Singhal, Parminder S Bhatia

Department of Anesthesia and Critical Care, V.M.M.C and Safdarjung Hospital, New Delhi, India

Address for correspondence: Dr. Kapil Gupta, Department of Anesthesia and Critical Care, V.M.M.C and Safdarjung Hospital, New Delhi, India
E-mail: kapilgupta75@indiatimes.com, kapgup11@yahoo.co.in

References

1. Klaastad O, Sauter AR, Dodgson MS. Brachial plexus block with or without ultrasound guidance. Curr Opin Anesthesiol 2009;22:655-60.
2. Sites BD, Brull R. Ultrasound guidance in peripheral regional anesthesia: Philosophy, evidence- based medicine, and technique. Curr Opin Anesthesiol 2006;19:630-9.
3. Chin KJ, Niazi A, Chan V. Anomalous brachial plexus anatomy in the supraclavicular region detected by ultrasound. Anesth Analg 2008;107:729-31.
4. Chin KJ, Perlas A, Chan VW, Brull R. Needle visualization in ultrasound -guided regional anesthesia: Challenges and solutions. Reg Anesth Pain Med 2008;33:532-4.
5. Cox JE, Chiles C, MacManus CM, Aquino SL, Chaplin RH. Transthoracic needle aspiration biopsy: Variables that affect the risk of pneumothorax. Radiology 1999;212:165-8.
6. Macfarlane A, Brull R. Ultrasound guided supraclavicular block. J New York Sch Reg Anesth 2009;12:6-10.

Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/0970-9185.101962