

Immediate Onset Pneumothorax after Classical Approach to Supraclavicular Brachial Plexus Block- A Case Report

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ABSTRACT

Pneumothorax is the commonest complication of brachial plexus block using the supraclavicular approach. The onset of pneumothorax is usually delayed. In this case, we report the immediate onset of pneumothorax after an attempted supraclavicular block using the 'Classical' technique. This report highlights the importance of maintaining a high index of suspicion of pneumothorax even in the immediate post block period.

Keywords: brachial plexus, supraclavicular block, pneumothorax

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INTRODUCTION

The supraclavicular approach to brachial plexus provides anesthesia to entire upper arm with a single injection of local anesthetic. The classical approach requires the elicitation of multiple paraesthesias. The incidence of pneumothorax has been reported to be as high as 0.5 to 5% with this technique.^[1] The onset of symptoms is usually delayed and it can take upto 24 hours.^[2] We present a case where pneumothorax appeared immediately after an attempted Classical Supraclavicular brachial plexus block.

CASE REPORT

A boy aged 15 years, ASA Physical status classification Grade-I, 56 kgs in weight and a height of 180cms was posted for removal of an implant in the left forearm under anaesthesia. The plating was done around 1 year back to fix fracture of both bones of left forearm under supraclavicular brachial plexus block. The patient had a history of musculoskeletal pain on upper back from the past 5 to 6 days for which he was taking muscle relaxants. All preoperative routine investigations including the chest X-ray (Figure 1) were normal. A 'Classical' left supraclavicular brachial plexus block was planned. Intravenous access was secured in the right hand. All monitors were attached and the patient was

monitored for heart rate, non-invasive blood pressure and oxygen saturation. All baseline parameters were normal. The baseline SpO₂ was 99%. As the patient was being positioned for the block, he complained of mild pain in the upper back but allowed us to continue with the procedure. On the first attempt, paraesthesia could not be elicited. When the block was attempted the second time, the patient started suddenly complaining of pain in the epigastrium and left hypochondrium followed by left sided chest pain. He also complained of pain while breathing. The procedure was abandoned. However on inspection the chest expansion was bilaterally equal. There was no respiratory distress. SpO₂ was 97%. The pain was presumed to be musculoskeletal in origin and inj. Tramadol 50mg IV was given for analgesia. The pain settled after a few minutes and it was decided to proceed with the case under general anaesthesia.

After preoxygenation with 100% oxygen, anaesthesia was induced with inj. propofol 140mg IV and rocuronium 40mg i.v. Airway was secured with a size 4 Classic LMA. Anaesthesia was maintained with isoflurane 1% along with O₂:N₂O(50:50) at 6 litres/min. Inj. diclofenac 50mg IV infusion was given for post-operative analgesia. Immediately after induction the Blood pressure dropped to 76/50mmHg and the heart rate went upto 126/min. It was managed with a fluid challenge and IV mephenteramine bolus. The haemodynamics remained normal in the middle of the procedure and towards the end patient again had significant hypotension with the lowest blood recorded as 80/54 mmHg which responded to IV mephenteramine. Air entry was equal in bilateral lung fields on auscultation. The surgery lasted around 35 minutes and the neuromuscular blockade was reversed with inj. neostigmine and inj. glycopyrrolate. The patient was shifted to PACU with stable haemodynamics. In the PACU, the patient was

comfortable and pain free. There was no respiratory distress. The vitals were- HR=76/min, BP=116/78, SpO₂=95%. There was decreased air entry in the left apical region on auscultation. It was decided to do a chest X-ray to rule out pneumothorax. A portable X-ray was done which revealed left sided pneumothorax with partial collapse of the left lung (Figure 2). Although the clinical picture did not warrant the insertion of an intercostal chest tube, still it was decided to call the general surgeon for chest tube

placement as a precautionary measure as our hospital caters only to orthopaedic patients and general surgical facilities are available at a far off centre. So, an intercostal drain was inserted in the left 5th intercostal space with water seal. Post procedural X-ray showed a fully expanded lung (Figure 3). The chest tube was taken out after 3 days and the patient was discharged on the 5th post-operative day in a stable condition.

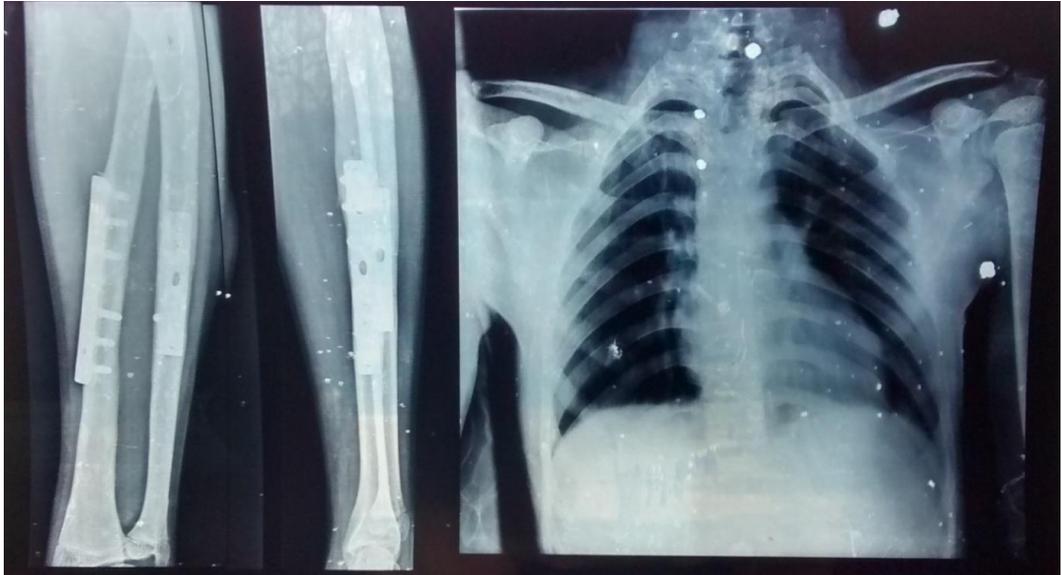


Figure 1.

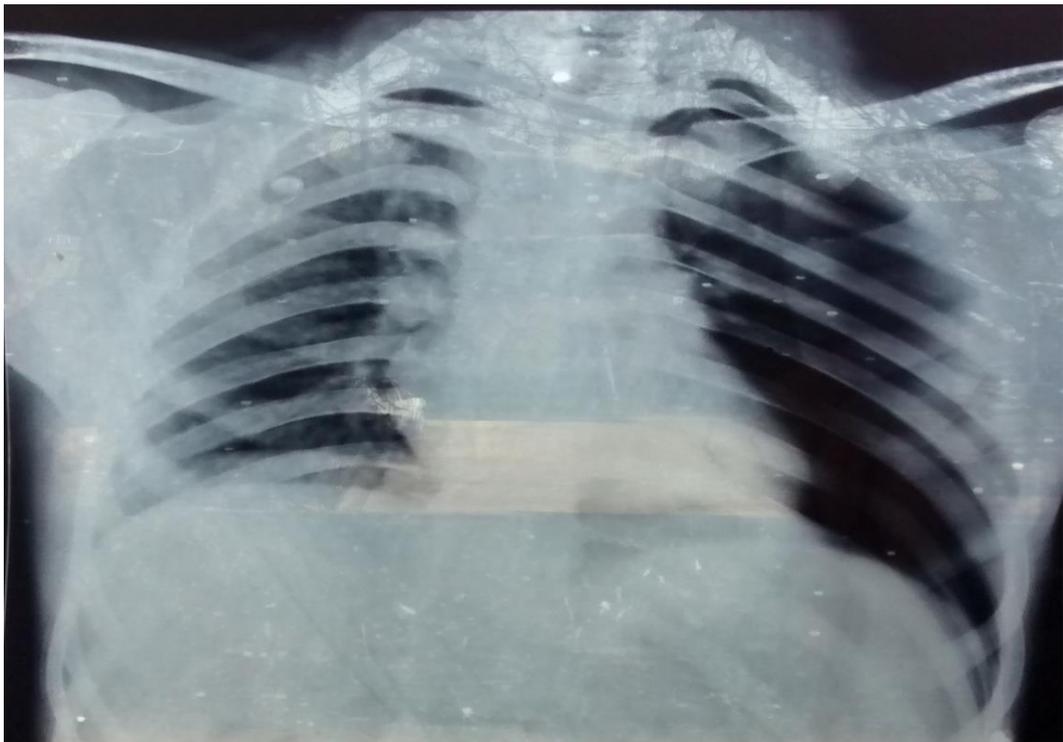


Figure 2.



Figure 3

DISCUSSION

Regional anesthesia for upper limb surgery has many advantages over traditional general anesthesia including more effective post operative analgesia, decreased requirement of systemic opioids and avoidance of airway instrumentation^[3]. If performed by experienced operators, it can provide anesthesia in a high majority of cases (94.2-94.7%) with a very low complication rate^[4,5,6]. The supraclavicular block, first described by Kulenkampf, provides a consistent homogenous blockade of the entire upper extremity without potentially sparing the cephalad (musculocutaneous) or caudad (ulnar) nerves of the brachial plexus^[7]. Prior to the introduction of ultrasound, the rate of pneumothorax was reported between 0.5 to 5%^[1], but with the introduction of ultrasound, the rate has significantly declined^[8]. Pneumothorax occurs because the apex of the lung is just medial and posterior to the brachial plexus and behind the first rib. When the pleura is punctured, there is a sudden onset of chest pain which may be associated with dyspnoea, cough and rarely hemoptysis. On physical examination, there may be decreased excursion of the affected side, increased resonance on percussion and decreased breath sounds on auscultation. Pneumothorax expands much faster when general anesthesia is administered along with nitrous oxide^[9].

In our case, the patient had probably received more than one pleural punctures which

explains the early onset of pneumothorax in contrast to the usual delayed onset. The anesthesiologist conducting the block was relatively less experienced with this technique. Also, our team mistook the symptoms as musculoskeletal pain due to the previous history of the same. It would have been wise to defer the surgery and evaluate the patient for the presence of pneumothorax. The deranged haemodynamics during the intraoperative period may have been caused by nitrous oxide as the patient remained haemodynamically stable in the post anaesthetic period.

CONCLUSION

We therefore suggest that whenever pleuritic pain occurs while performing a brachial plexus block, one should keep a high index of suspicion of pneumothorax even in the immediate post procedural period. Also, the use of ultrasound guided technique in place of the 'Classical' approach to the brachial plexus block is highly recommended as it is associated with greatly reduced complication rate.

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