

Comments on: “Phrenic Nerve Block, the Rescue Management for Pneumothorax after Retrolaminar Block”

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Dear Editor,

We read with interest the recent publication by Mishra *et al.* in the June 2020 issue of Sri Lankan Journal of Anaesthesiology.¹ We appreciate the authors for sharing this interesting case. However, we have the following concerns:

1. Intraoperative development of pneumothorax during robotic laparoscopic nephrectomy could result from single or multiple causes, as mentioned by authors. In the reported scenario, spontaneous rupture of pulmonary bulla probably caused the pneumothorax. Iatrogenic puncture of pleura during Retrolaminar block (RLB) is a rare possibility, as the pleura lies more anterior and lateral to the site of injection.
2. Pfeiffer *et al.* described the anatomical landmark guided RLB as a simple alternative to traditional paravertebral block to minimize the chances of pleural injury. Later, mandatory use of ultrasonography (USG) has been suggested to correctly identify the plane between thoracic laminae and deep paraspinal muscles and minimize the risk of epidural injection landmark technique.² So, it

is prudent to use real-time USG guidance during RLB to avoid any inadvertent complications.

3. Pneumothorax is a recognized complication of laparoscopic surgery, with an incidence of 0.01–0.4%.³ According to the authors, pneumothorax was diagnosed after extubation and resolved in 24 hours. Intraoperative chest auscultation or ultrasound scanning could have helped in the early diagnosis of pneumothorax in a patient of chronic obstructive pulmonary disease (COPD) with a rise in end-tidal CO₂ and airway pressures. Moreover, the stable intraoperative haemodynamics and other clinical parameters also indicate the possibility of capnothorax, which can resolve spontaneously without invasive management.³
4. Phrenic nerve block (PNB) causes an ipsilateral hemi-diaphragmatic palsy (HDP), resulting in loss of cephalocaudal movements of the diaphragm during respiration. Consequently, it will reduce the patient's ability to generate negative pressure to expand the lung. Hence, PNB, especially in a COPD patient, may not be an ideal choice, for the management of pneumothorax.
5. The authors used an initial bolus of 0.5% bupivacaine 20 ml, followed by two doses of 0.25% bupivacaine 15 ml at 6 hours and 12 hours for USG guided PNB. Phrenic nerve lies very close to the brachial plexus (within 2 mm) at the level of cricoid cartilage or sixth cervical vertebra.⁴ Hence, administration of such large volumes of local anaesthetic may result in inadvertent brachial plexus block

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and/or other complications. Moreover, the identification of phrenic nerve may not always be feasible, even with the high-resolution USG.⁴

6. Rupture of the pleural bleb can cause primary spontaneous unstable pneumothorax, which may progress to tension pneumothorax, requiring immediate drainage. HDP following PNB results in cephalad shifting of the ipsilateral diaphragm. Thus, reducing the volume of the chest cavity. The air leak from open bulla may further increase pressure inside the chest, which may worsen the clinical course of pneumothorax.
7. In primary pneumothorax, the air is collected in intra-pleural (between two pleural layers) and extra-pleural (inside the chest cavity) spaces. The collected air may cause pleuritic pain leading to laboured breathing. PNB in this scenario helps to reduce this pain making breathing more comfortable. Therapeutic use of PNB in other types of pneumothorax may not be helpful, instead, it may worsen symptoms.

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The Authors' Reply to Comments Made on the Article "Phrenic Nerve Block, the Rescue Management for Pneumothorax After Retrolaminar Block"

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1. Reply for comment number 1

We acknowledge the fact that in the current scenario, multiple causes could have led to pneumothorax. However, the presence of bulla was not seen in pre-operative Chest X-ray (rules out large bulla). CT- thorax could have been beneficial in such case.

However, due to no indication, CT-thorax was not done in this patient. Moreover, though a rare possibility, the diagnosis was made as per the most probable diagnosis.

2. Reply for comment number 2

We understand that USG-guided RLB has

better safety and efficacy. However, the USG machine was not accessible at that time within OT complex.

3. Reply for comment number 3

The presence of pneumoperitoneum during robotic laparoscopic surgery is associated with changes in respiratory mechanics. The rise in airway pressures and end-tidal CO₂ during pneumoperitoneum, increases further with Trendelenburg position.¹ Hence, we did not suspect pneumothorax intra-operatively as these changes were already expected. There were no significant haemodynamic changes intra-operatively.

4. Reply for comment number 4

Phrenic nerve block (PNB) causes an ipsilateral hemi-diaphragmatic palsy. This is the mechanism which promotes symphysis of two pleura due to decreased chest volume. Moreover, as the pre-operative lung function status was normal, unilateral diaphragmatic palsy was not considered detrimental for the patient.

5. Reply for comment number 6

This is one different scenario and explanation given in presence of tension pneumothorax. However, as there were no features of hypotension or pleuritic chest pain, tension pneumothorax was ruled out.

6. Reply for comment number 7

The PNB in this context contributes to pleural leak healing with added benefit of relieving pain. We have already acknowledged in our article that the therapeutic use of PNB in different types of pneumothorax needs to be further researched in bigger sample sizes, so as to establish its significance.

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