

Bilateral diaphragmatic palsy in a parturient for emergency Caesarean delivery - What are our concerns?

Sir,

Bilateral diaphragmatic palsy in a parturient is a rare condition and increases the peri-operative pulmonary complications.^[1,2] A 27-year-old female (G₂P₂L₁) of term gestation presented with dyspnoea and orthopnoea for a month. She had history of anterior mediastinal mass excision 4 years back following which she had bilateral diaphragmatic palsy and was managed conservatively. At her latest hospitalisation, her respiratory rate was 38/min with accessory muscle usage and increased to 46/min when she lay supine, with SpO₂ dropping to 90% while breathing room air. Chest auscultation revealed decreased bilateral basal air entry. Chest X-ray (CXR) with abdominal shield showed bilateral elevated hemi-diaphragm [Figure 1]. M-mode lung ultrasonography (USG) revealed restricted diaphragmatic movement with diaphragmatic excursion of 1.5 cm on both the sides in anterior axillary line. She was posted for emergency Caesarean delivery and transferred to operating room with oxygen supplementation in sitting posture. She was pre-oxygenated for 5 min in semi-recumbent position and intubated by rapid sequence induction in rapid airway management position (RAMP). Positive pressure ventilation was initiated with tidal volume of 350 mL, respiratory rate

of 20–25/min and I: E ratio of 1:2 to maintain end-tidal CO₂ between 30 and 35 mm Hg. Baseline peak airway pressure and plateau pressure were 35 and 25 mm Hg, respectively. Anaesthesia was maintained with 100% oxygen and sevoflurane (MAC 1%) till baby delivery after which Inj. midazolam (1 mg) and Inj. fentanyl (100 µg) were administered and MAC was maintained upto 0.7% with air and oxygen mixture (FiO₂ = 60%). Inj. oxytocin 10 U was administered for the prevention of intrapartum haemorrhage. Patient was transferred to critical care unit for elective post-operative ventilation. M-mode lung USG at the anterior axillary line in the spontaneous mode of ventilation after 8 h of surgery showed bilateral diaphragmatic excursion of 1.7 cm suggestive of bilateral diaphragmatic palsy. Her blood gas analysis revealed PO₂/FiO₂ ratio of 208. Epidural catheter was placed at L1–L2 level and a bupivacaine 0.125% infusion was commenced. The trachea was extubated after 4 h of spontaneous breathing trial. She received non-invasive ventilation (NIV) CPAP (8 cm of H₂O) with FiO₂ – 21%. She was weaned off from NIV over 2 days and advised to do incentive spirometry with oxygen prongs.

Bilateral diaphragmatic palsy results in difficulty in weaning the patients from ventilator.^[1,3] Conservative management such as incentive spirometry and chest physiotherapy improves pulmonary function. Plication surgery is indicated for symptomatic patients not responding to conservative management.^[4] Paradoxical movement in fluoroscopy and lung USG helps us in establishing the diagnosis.^[3,4] Bilateral diaphragmatic palsy reduces the forced vital capacity and expiratory reserve volume in erect posture and then decreases

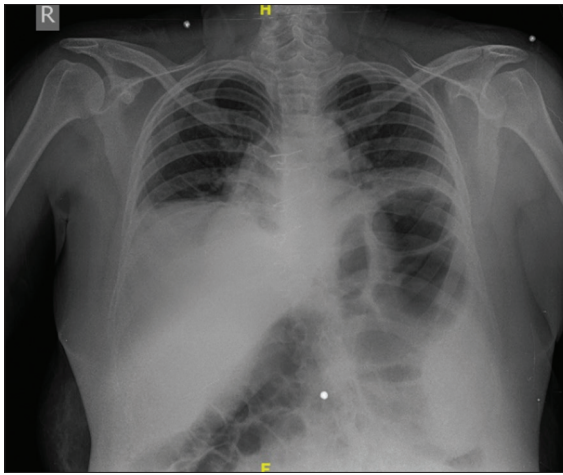


Figure 1: Chest X-ray with bilateral elevated diaphragm

functional residual capacity (FRC) and total lung capacity in supine position.^[5] Increase in intra-abdominal pressure (IAP) worsens the scenario of these patients. Pregnancy progressively raises IAP towards term and increases the risk of hypoxemia, atelectasis and aspiration.^[2,6] CXR could not confirm diaphragmatic palsy as there is elevation of bilateral diaphragm during pregnancy. M-mode USG aids in diagnosis and monitoring diaphragm function peri-operatively. Neuraxial blockade can reduce the lung capacity and volumes due to loss of intercostal muscle tone and also leads to spontaneous rupture of diaphragm.^[1,2,6] Position of these patients during induction poses a challenge to anaesthesiologist and so induction and intubation in RAMP to reduce further fall in FRC due to supine position. Staged weaning is suggested as they are at risk of respiratory failure and epidural analgesia aids her in improving the FVC during weaning. NIV reduces the work of breathing, atelectasis and the risk of infection associated with intubation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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