Cesarean Section in a Parturient with Giant Lung Cyst

Abstract
Asymptomatic lung cysts in prepregnant state can have its first manifestation during pregnancy due to altered respiratory physiology. They offer special challenge due to difficult diagnosis and definite treatment during pregnancy. We report case of a 26 years old parturient, G2P1L0 at 36 weeks period of gestation who presented as non resolving pneumothorax which was later diagnosed as a giant lung cyst for cesarean section.

Keywords: Anesthesia, cesarean section, cyst, epidural, lung diseases, pregnancy, spinal

Introduction
A lung cyst is a round air space defined pathologically by an epithelial or fibrous outer wall.[1] Cysts can occur in the subpleural areas or main parenchyma and can be solitary or diffuse. Solitary cysts may be due to age-related phenomenon, remnant of prior trauma or an infection like hydatid cyst. Multifocal cysts can occur with lymphoid interstitial pneumonia, primary and metastatic cancers and infections.

Lung cysts that are asymptomatic in the prepregnant state can have its first manifestation during pregnancy due to altered respiratory physiology. One of the causes of spontaneous pneumothorax in pregnancy is rupture of underlying lung cyst – subplueral blebs and bullae being most common.[2] Our patient was 26-year-old woman at 36 weeks pregnancy with multiple lung cysts who presented as a non-resolving pneumothorax for lower segment cesarean section (LSCS).

Case Report
A 26-year-old parturient, G2P1L0 at 36 weeks period of gestation and previous LSCS presented in the emergency department with the complaint of breathlessness and chest pain for 1 day. She was not registered in the antenatal clinic, had no history of previous similar complaints or any significant medical or surgical record. She was a non-smoker and a housewife by occupation. On examination, she had tachycardia HR = 110/ min, tachypnea RR = 30–32/min with use of accessory muscles, BP = 110/82 mm Hg, Spo2 = 90–91% on room air, and 96–97% on FiO2 of 0.5 – 0.6 using face mask. On percussion, a hyper resonant note was found on the left side with reduced air entry on auscultation. Heart sounds were normal. Chest X-ray with abdominal shield was done and diagnosis of left pneumothorax was established [Figure 1a]. An ICD was inserted on left side, but there was a minimal improvement in the clinical condition of the patient [Figure 1b]. Therefore, chest tube was repositioned followed by a repeat X-ray but no radiological improvement was seen with little benefit in the clinical condition of the patient. After a collaborative consultation with a radiologist, physician, and anesthesiologist and based on chest X-ray findings a provisional diagnosis of left lung cyst was made. Patient was planned for an elective cesarean section in view of associated medical condition and previous LSCS under combined spinal epidural (CSE) anesthesia. CSE was given at L4-L5 space with 1.6 ml of 0.5% bupivacaine (H) and epidural catheter was fixed at 8 cm. A sensory level achieved was T6 and no epidural augmentation was required intraoperatively. The patient remained hemodynamically stable during the surgery with no deterioration of respiratory parameters. A healthy male baby was delivered. Dexamethasone 6 mg with 6 ml of 0.125% bupivacaine was given through epidural catheter every 12 hourly upto 72 h for postoperative pain relief. Post-delivery a contrast enhanced computed tomography (CECT) thorax was done.

Received : 23-Jun-2019
Revision : 09-Jul-2019
Accepted : 10-Nov-2019
Published : 11-Mar-2020

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Access this article online
Website: www.joacc.com
DOI: 10.4103/joacc.JOACC_28_19

How to cite this article: Gahlot D, Saxena KN, Wadhwa B. Cesarean section in a parturient with giant lung cyst. J Obstet Anaesth Crit Care 2020;10:51-3.
which diagnosed multiple giant lung cysts over left upper and lower zone and few small lung cysts over right upper zone [Figures 2 and 3]. She underwent thoracotomy with excision of multiple lung cysts bilaterally was discharged on 14th postoperative day.

**Discussion**

Our case was of a young parturient presenting in her last trimester with breathlessness, chest pain and decreased air entry on the left side of chest. She was managed as a case of left pneumothorax, however, non-improving clinical condition of the patient even after necessary intervention and closer look at serial chest X-rays lead to differential diagnosis of left-sided large lung cyst which was confirmed later on higher imaging.

Pregnancy offers a state of changes in respiratory physiological parameters. Expanding uterus creates a reduction in FRC by 20% through cephalad pushing of diaphragm resulting in reduced oxygen reserve. In addition, there is an increased oxygen demand by up to 20% of prepregnant values during term gestation, which in labor can go up to 40–75% of the prelabor values. Even slight impairment of ventilation is poorly tolerated during pregnancy and labor, can be detrimental to both mother and fetus. Thus, any pulmonary pathology in pregnancy needs to be managed carefully and treated with prompt effect for a better fetal and maternal outcome. Increase in intrathoracic pressure in pregnancy and labor can increase the likelihood of cyst rupture resulting in pneumothorax. The British Thoracic Society Pleural Disease (BTPD) Guideline 2010 recommends that pneumothorax in pregnancy should be managed in a similar way as of a non-pregnant patient. Our patient presented as pneumothorax but had no improvement with intercostal drain insertion (ICD) insertion and other necessary intervention which lead to suggestion of an alternative diagnosis of lung cyst that was confirmed on CECT thorax post-delivery. Our patient had multiple bilateral lung cysts, with a huge lung cyst on left side which was misdiagnosed as pneumothorax. There was no finding of pneumothorax on CT scan explaining no improvement in clinical and radiological condition of the patient after ICD insertion. Elective assisted vaginal delivery with epidural anesthesia at or near term is the safest approach to avoid worsening of symptoms and unindicated cesarean section in parturients with lung cysts. However, our patient was at near term with a history of previous LSCS and little improvement in respiratory condition, an elective C-section was planned. CSE with low dose subarachnoid block (SAB) was the anesthesia technique of choice. Regional anesthesia offers advantages of minimal respiratory mechanics disturbances, avoidance of risk of cyst rupture and complications like bronchopleural fistula, early detection of hypoxia, pulmonary embolism or worsening of respiratory symptoms as the mentation of the patient is intact and a better fetal outcome. General anesthesia has drawbacks of risk of rupture of the lung cyst from the use of nitrous oxide and administration of positive pressure ventilation, impairment of ventilation by increased dead space due to lung cyst causing ventilation-perfusion mismatch.

All the appropriate measures should be taken to avoid high level of subarachnoid block. A higher level of block results in blockade of muscles of respiration with a reduction in inspiratory capacity and expiratory reserve volume, deterioration of symptoms and even rupture of underlying bullae have been reported. Epidural catheter in situ helps

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**Figure 1:** (a) Left lung cyst appearing as a pneumothorax with mediastinal shifting. (b) Left ICD in situ with non-expansion of lung parenchyma

**Figure 2:** CECT thorax (coronal) showing large lung cyst

**Figure 3:** CECT thorax showing multiple lung cysts in bilateral lung fields
to augment level of block in the intraoperative period in case there is inadequate level, failure of block or regression of block due to prolonged duration of surgery with prevention of unnecessary conversion to general anesthesia. Postoperative pain can cause worsening of respiratory parameters and thus needs to be managed appropriately. Epidural dexamethasone with bupivacaine helped us mitigate postoperative pain with no effect on respiratory mechanics. Epidural dexamethasone have been successfully used in literature in the management of post-operative pain with reduce requirements of epidural local anesthetics and other systemic analgesics.[8–10] It provides effective postoperative analgesia without risk of sedation, respiratory depression, and hemodynamic instability. Thomas found that epidural dexamethasone is significantly more effective than I.V. dexamethasone with lesser systemic side effects to reduce postoperative pain and morphine consumption following laparoscopic cholecystectomy.[9] Although a dose range from 5–8 mg epidural dexamethasone have been used successfully, exact dosing of dexamethasone and timing of administration is still under research. Therefore, a combined spinal epidural appears to be a safe and effective plan of anesthesia in parturient with giant lung cysts.

Recurrence of pneumothorax is common in subsequent pregnancies posing risks to the mother as well fetus.[11] Thus, a corrective surgical procedure (VATS) is recommended after delivery to avoid recurrence in subsequent pregnancies.[11] Intrapartum, second trimester is the optimal time for surgical correction.[2] Avoidance of surgical intervention during the third trimester is helpful in preventing preterm labor and possible preterm delivery.[2]

Radiological investigation is a necessary part of management for definitive diagnosis in such cases, but due to the risk of radiological exposure to the fetus it is not preferred. However, it should not be withheld if it is categorically necessary for better maternal outcome. The accepted safe cumulative dose of ionizing radiation during pregnancy is 5 rad or 50 mGy.[12] One mSv (millisievert) is the dose produced by exposure of one mGy (milligray) of radiation. Effective radiation exposure from chest X-ray and CT chest is 0.1 mSv and 5–7 mSv, respectively.[11] This implies that in spite of limitation of radiation exposure during pregnancy, chest X-ray and CT chest can be used with abdominal shield for diagnosis depending on the need of the hour. Our patient was at near term and planned of elective C-section, thus in best interest of both mother and fetus CT chest was planned post-delivery.

Our patient had a large lung cyst which appeared as pneumothorax radiologically as well as clinically but had no resolution with standard management protocols. Further, closer look at the X-rays lead to a provisional diagnosis of lung cyst which was confirmed later. This implies that an extra vigilant observation of patient’s clinical condition, investigations and a divergent thinking can help reaching to more definitive diagnosis with avoidance of unnecessary interventions and delaying the definite management. CSE appears to be safer anesthesia of choice than general anesthesia with avoidance of higher level of blockade in absence of any fetal compromise and associated maternal comorbidities.

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.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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