A Rare Case of Pregnancy with Primary Spontaneous Pneumothorax Posted for Emergency Cesarean Section

Abstract
Spontaneous pneumothorax during pregnancy is a rare condition. Only 56 cases have been reported in the English literature. A primigravida at 32 weeks pregnancy presented with breathing difficulty, left chest pain, and cough for 2 days. She was diagnosed to have left primary spontaneous pneumothorax and multiple unruptured blebs and bullae of the right lung. A left chest tube was inserted which relieved her symptoms. However, after 3 weeks, she again developed breathing difficulty so she was planned for an emergency cesarean section. The anesthesia was challenging as she could lie down only in the 60º propped-up position. With spinal anesthesia, desired level of block could not be achieved. General anesthesia also could not be given as it will cause further rupture of blebs and bullae. Therefore, the operation was performed under epidural anesthesia using injection ropivacaine in the same 60º propped-up position.

Keywords: Cesarean section, epidural anesthesia, general anesthesia, spinal anesthesia, spontaneous pneumothorax

Case Report
A 27-year-old primigravida at 32 weeks pregnancy presented to our institute with a history of breathing difficulty, left chest pain, and cough for 2 days. She was tachypneic with a respiratory rate of 28/min, pulse rate of 128/min, blood pressure of 120/80 mmHg and oxygen saturation (SpO₂) of 96%. She was given oxygen at 4 L/min by face mask and she was kept in propped-up position. On clinical examination of the chest, left pleural effusion was suspected. But the physician was not sure of the diagnosis and he suspected that the condition could be due to a cardiac cause, hence she was referred to a cardiologist. The cardiologist suspected pulmonary embolism as a possible diagnosis therefore, he advised computed tomography (CT) pulmonary angiography. The risk of radiation to the fetus was explained to the patient and relatives and informed consent was taken. CT scan was done with protective lead shield placed over the abdomen. It showed no evidence of pulmonary embolism but it showed left-sided pneumothorax causing passive collapse of upper and lower lobes and multiple unruptured bullae and blebs of the right lung [Figure 1]. A left chest tube was then inserted and the chest X-ray was done to confirm the position of the tube and any residual pneumothorax [Figure 2]. After this intervention, her symptoms improved and she was stable. Ultrasound showed a single live pregnancy with fetal heart rate of 150/min. She was kept under observation in the hospital to wait for fetal maturity. Fetal well-being was also regularly monitored. After 3 weeks, she complained of breathing difficulty again. It was suspected that multiple unruptured bullae and blebs on the right lung and pressure on the lungs by the gravid uterus caused the symptoms of breathlessness. After the risk of operation was explained and informed consent obtained, the operation was performed under epidural anesthesia using injection ropivacaine in the same 60º propped-up position.
obstetrician decided to go for an emergency cesarean section. The anesthesia was challenging because she could lie down only in the 60° propped-up position. In this position, it was not possible to achieve the desired level of block with spinal anesthesia. Moreover, general anesthesia was best avoided as positive-pressure ventilation may cause rupture of bullae and blebs which would lead to further pneumothorax. Epidural combined with spinal anesthesia would cause profound hemodynamic changes compared with epidural anesthesia alone. Therefore, it was decided to go for epidural anesthesia using injection ropivacaine. Ropivacaine (20 ml, 0.5%) was injected at L3-L4 interspace with a catheter in place. The level of block achieved was up to T6. Cesarean section was conducted in the same 60° propped-up position with oxygen given by face mask at 6 L/min. The patient’s heart rate, blood pressure, respiratory rate, SpO₂, and electrocardiogram (ECG) were monitored during the entire operation. Although the patient was uncomfortable to some extent due to the awkward position, the operation was uneventful. A healthy baby with Apgar (appearance, pulse, grimace, activity, and respiration) scores of 7 and 9 at 1 and 5 min, respectively was delivered. The mother had a smooth recovery and the chest tube was removed on the fifth postoperative day.

**Discussion**

Breathing difficulty and chest pain during pregnancy may be due to pulmonary embolism caused by venous thrombosis, amniotic fluid, or air embolism, pneumothorax, tension pneumothorax, pulmonary edema, asthma, pneumonia, and rarely spontaneous pneumothorax. Risk factors for primary spontaneous pneumothorax are bronchial asthma, cocaine abuse, hyperemesis gravidarum, previous pneumothorax, underlying lung infection, iatrogenic causes, (central venous line insertion) and endotracheal intubation with positive-pressure ventilation. Ropivacaine was chosen for this patient as it has the most hemodynamic and cardiovascular stability among local anesthetics used for epidural anesthesia. It is a long-acting amide local anesthetic. It is used in 0.5–1% concentration for surgical anesthesia. It is unique among local anesthetics since it exhibits a vasoconstrictive effect at clinically relevant doses. It has excellent sensory blockade with low motor blockade. Pneumothorax in pregnancy may be treated by observation, needle aspiration, and chest tube insertion. The chest tube is the recommended treatment for large pneumothorax (more than 20% of hemithorax). The definitive treatment of pneumothorax due to rupture of bullae and blebs is surgical pleurodesis with or without bullectomy. This operation can be done by open thoracotomy or video-assisted thoracoscopic surgery (VATS). Recently VATS has become the preferred technique for treatment of pneumothorax as it is associated with smaller incision, decreased postoperative pain, and shorter hospital stay compared to thoracotomy. Our patient later underwent VATS.

**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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Nil.
Conflicts of interest

There are no conflicts of interest.

References

1. Harten JM, Brown AG, Davidson IT. Post partum pneumothorax: Two case reports and discussion. Int J Obstet Anaesth 2000;9:286-9.
2. Garg R, Sanjay, Das V, Usman K, Rungta S, Prasad R. Spontaneous pneumothorax: An unusual complication of pregnancy-A case report and review of literature. Ann Thorac Med 2008;3:104-5.
3. Noppen M. Spontaneous pneumothorax: Epidemiology, pathophysiology and cause. Eur Respir Rev 2010;19:217-9.
4. Aye CYL, McKean D, Dark A, Akinsola SA. Bilateral primary spontaneous pneumothoraces postcaesarean section- another reason to avoid general anaesthesia in pregnancy. BMJ Case Rep 2012. pii: bcr0220125724. doi: 10.1136/bcr.02.2012.5724.
5. Madan K, Singh N, Jain V, Aggarwal AN. Spontaneous pneumothorax following caesarean section under spinal anaesthesia. BMJ Case Rep 2013. pii: bcr2012008507. doi: 10.1136/bcr-2012-008507.
6. Lal A, Anderson D, Coven M, Lindow S, Arnold AG. Pneumothorax and pregnancy. Chest 2007;132:10448.
7. Brown DL. Spinal, epidural, and caudal anesthesia. In Miller RD, Eriksson LI, Fleisher LA, Wiener-Kronish JP, Young WL, editors. Miller’s Anesthesia, 7th ed. Philadelphia: Churchill Livingstone Elsevier; 2010. p. 1611-38.
8. Nwaejike N, Aldam P, Pulimood T, Giles R, Brocelsby J, Fuld J, et al. A case of recurrent spontaneous pneumothorax during pregnancy treated with video assisted thoracoscopic surgery. BMJ Case Rep 2012. pii: bcr0520114282. doi: 10.1136/bcr.05.2011.4282.