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Spontaneous pneumothorax during pregnancy: a case report

Case Report

Temesgen Tilahun[1]*, Diriba Kebede[2], Haileyesus Tesfaye[3] & Diriba Feyisa[4]

[1]*Department of Obstetrics & Gynecology, Institute of Health Sciences, Wollega University, Nekemte, Ethiopia*

[2]*Department of Obstetrics & Gynecology, Nekemte Comprehensive Specialized Hospital, Nekemte, Ethiopia*

[3]*Department of Surgery, Nekemte Comprehensive Specialized Hospital, Nekemte, Ethiopia*

[4]*Department of Anesthesia, Institute of Health Sciences, Wollega University, Nekemte, Ethiopia*

Abstract

Background: *Spontaneous pneumothorax is a rare and life-threatening emergency. It presents a major risk to both the mother and the fetus when it happens during pregnancy. For a better outcome, a high index of suspicion and early diagnosis are essential. There is no set standard for the treatment of this illness.*

Case presentation*: We report the case of a 29-year-old woman from Western Ethiopia who developed a spontaneous large pneumothorax during her pregnancy. Upon arriving at the hospital, she experienced respiratory difficulties and was treated with the insertion of a chest tube.*

Conclusion: *When a pregnant woman complains of breathing difficulty, the diagnosis of spontaneous pneumothorax should be taken into consideration. It is advised to involve a multidisciplinary team in its management for positive fetomaternal outcomes. Subsequent surgical intervention should be considered because of the risk of disease progression and recurrence.*

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*Corresponding Author:
Temesgen Tilahun

E-mail:
ttamuko@yahoo.com

INTRODUCTION

Pneumothorax is the presence of air in the pleural space (1). Spontaneous pneumothorax during pregnancy is a rare condition in which air accumulates in the pleural cavity, leading to lung collapse, all without any trauma to the lung or chest wall (2,3). Small apical blebs or bullae commonly rupture to induce this disease. Common risk factors include underlying respiratory illnesses, asthma, and a history of pneumothorax (2,4). When a pregnant woman presents to the hospital with chest pain and dyspnea, it should be ruled out.

The management is more difficult due to changes in respiratory physiology and restrictions on using radiological procedures,

such as computerized tomography (CT) and chest X-rays, as the definitive diagnostic instruments (2,5). Problems with this disease's diagnosis and therapy are all interrelated (5). In this case report, we explore a spontaneous pneumothorax, which can be considered a rare but noteworthy complication that may occur during the third trimester of pregnancy. By examining this case, we aim to enhance our understanding of such occurrences and improve awareness among healthcare professionals.

CASE PRESENTATION

A 29-year-old woman who was pregnant for the first time came to a hospital in Western Ethiopia. She was 33 weeks and 2 days pregnant, based on an early ultrasound. She had been experiencing shortness of breath for two days before her admission. She was easily fatigued but showed no signs of a chest injury, fever, cough, night sweats, or chest pain. She has never smoked before. She had two antenatal care (ANC) appointments during the current pregnancy, during which she received iron and folic acid supplements. In addition, she received two doses of tetanus toxoid. No other interventions were given to the patient.

Her prior medical records revealed that she had received tuberculosis treatment ten years prior. She has never had heart disease, hypertension, diabetes, or bronchial asthma. Her past surgical, personal, and social histories are not significant.

The patient was visibly acutely ill. Her vital signs were: blood pressure 100/80 mmHg, pulse rate 140 beats per minute, respiratory rate 36 breaths per minute, and temperature 36.5°C. Oxygen saturation was critically low at 88%. She presented with pink conjunctivae. The lymphatic and cardiovascular systems were normal. Chest examination revealed absent air entry in the left lung field. Abdominal examination showed a 38-week-sized uterus in a longitudinal position with a cephalic presentation, no contractions, and a fetal heartbeat of 146 beats per minute. The genitourinary system showed no costovertebral angle tenderness. She showed no palmar pallor and was oriented to time, person, and place. Reflexes were normal, with no neurologic deficits.

Chest x-ray (CXR) results from the investigation revealed a significant left-side pneumothorax, a partially collapsed left lung, and fibrotic alteration in the right lung (Figure 1). The COVID-19 test and Gene Xpert for tuberculosis (TB) were negative. The random blood sugars (RBS), erythrocyte sedimentation rate (ESR), and complete blood count (CBC) were all within the normal ranges (Table 1).

An Obstetrics ultrasound examination by a radiologist showed an aggregate gestational age of 33 weeks, longitudinal lie, cephalic presentation, reassuring biophysical profile, fundal placenta, and adequate amniotic fluid.

With the final diagnosis of spontaneous massive left-side pneumothorax and third-trimester pregnancy, the patient was admitted. She was put on oxygen with a face mask. After informed written consent was taken, the patient was prepared for the procedure. Under local analgesia, the chest tube was inserted in the operation room. She responded well to the procedure. After the procedure, the patient was put on antipain, ceftriaxone, and dexamethasone for lung maturity. The chest tube was removed on the 4th post-procedure and discharged on the 8th post-procedure day with stable maternal and fetal condition. She was advised to continue with antenatal care.

Table 1. Laboratory investigations of spontaneous pneumothorax during Pregnancy managed at a tertiary Hospital, Western Ethiopia, 2022.

Time of the investigations	**Laboratory tests**	**Results**
At admission	CBC count	WBC count= 15,300 cells/µL; RBC count= 5.2 million cells/µL; Hematocrit= 45.1%; Platelet count= 178,000 cells/µl
	Urinalysis	Non-revealing
	RBS	108mg/dl
	Blood group	A+
	Obstetric ultrasound	3rd trimester pregnancy plus reassuring biophysical profile
	ESR	38mm/hr
	Gene x part	Negative

CBC: Complete blood count; WBC: white blood cell, RBC: Red blood cell; ESR: erythrocyte sedimentation rate; RBS: Random blood sugar

At 41 weeks, the patient gave birth to a male alive neonate weighing 3200 gm with 1st and 5th APGAR scores of 8 and 10, respectively, by cesarean section for the indication of cephalopelvic disproportion. On the third postoperative day, the patient and the newborn were deemed fit for discharge and left the hospital in good health.

Figure 1. Chest X-ray of spontaneous pneumothorax during Pregnancy managed at a tertiary Hospital, Western Ethiopia, 2022.

DISCUSSION

Pneumothorax is the accumulation of air in the pleural space, which can significantly impact lung function (1). There are two categories of spontaneous pneumothorax: primary spontaneous pneumothorax, characterized by the absence of any underlying lung disease, and secondary spontaneous pneumothorax, which arises in an existing lung condition. Understanding these distinctions is essential for effective diagnosis and treatment (6,7). Our case had received therapy for tuberculosis five years back.

The most typical symptoms of pneumothorax in pregnant patients are dyspnea and chest discomfort (2,3,8). These symptoms, nevertheless, are vague and can potentially be linked to pregnancy and pregnancy-related problems. This may result in incorrect diagnoses (2,8,9). Consequently, a strong index of suspicion is required to consider this condition (5). Low oxygen saturation and dyspnea were present in our patient.

Though there are common clinical features of pneumothorax, the diagnosis of spontaneous pneumothorax during pregnancy is difficult (9,10). This could be explained in one of two ways. The first is a result of pregnancy-related respiratory alterations. Pregnant women have physiological pregnancy-related dyspnea in 75% of cases (4,9). The use of imaging techniques during pregnancy, such as chest x-rays and CT scans, is also limited (9).

A chest radiograph with an abdominal shield is the standard method for diagnosing pneumothorax in pregnant patients without exposing the fetus to radiation. Contrast-enhanced CT scans with an abdominal shield should only be done for those needing surgical treatment (1,2,6,9,10,11).

The management of pregnancy complicated by spontaneous pneumothorax presents challenges, and there remains ongoing dialogue regarding the most effective approaches to this situation (2, 4,10). There are no clear recommendations or set standards in patient management. Early initiation of treatment and a multidisciplinary team is important (2,11). In cases where patients do not exhibit dyspnoea or fetal distress, and the size of the pneumothorax is less than 2 cm, as indicated by chest X-ray, it is generally acceptable to manage them through observation alone (9). Symptomatic patients with primary spontaneous pneumothorax can be managed by chest tube insertion (9,12). Thoracotomy and video-assisted thoracoscopic surgery (VATS) are effective options for managing persistent or recurrent pneumothorax that hasn't responded to adequate drainage. These surgical approaches are also beneficial for addressing bilateral pneumothorax and hemopneumothorax, providing a pathway toward better patient outcomes (5,9,10). In our case, the insertion of a chest tube was carried out collaboratively with a skilled team of medical professionals. This team included an obstetrician, a surgeon, an anesthesiologist, and various members of the operating room staff, all of whom played crucial roles in ensuring the procedure was performed safely and efficiently. Their combined expertise contributed to a comprehensive approach to the patient's care, highlighting the importance of teamwork in complex medical situations.

The developing fetus experiences serious problems as a result of spontaneous pneumothorax (10). This could be the result of

severe hypoxia brought on by impaired ventilation. This might, therefore, have a significant impact on fetal oxygenation, resulting in fetal suffering and possible fetal loss and premature delivery (5,10,12,13). In our scenario, the patient had an oxygen saturation of 88% when she arrived at the hospital. It is discovered that the fetal outcome is favorable, which may be attributed to early diagnosis and the involvement of a multidisciplinary team in patient management.

The management of obstetric patients with pneumothorax must be approached with utmost care. It is clear that spontaneous delivery and cesarean delivery under general anesthesia should be avoided. These methods can significantly elevate intrathoracic pressure due to hyperventilation and Valsalva maneuvers during normal delivery, as well as positive pressure ventilation during general anesthesia. Taking the necessary precautions in these cases is essential for ensuring the safety and health of both the mother and the baby (1,2,9). Spinal anesthesia is the preferred option whether the cesarean section is done on an elective or emergency basis (1,2,8). It is also recommended that the second stage of labor be shortened with instrumental deliveries. In our case, cesarean section was done under spinal anesthesia.

CONCLUSION

When a pregnant woman complains of breathing difficulty, the diagnosis of spontaneous pneumothorax should be taken into consideration. It is advised to involve a multidisciplinary team in its management for positive fetomaternal outcomes. It is crucial to consider pursuing further surgical intervention, given the significant risk of disease progression and the likelihood of recurrence if left unaddressed.

Abbreviations: ANC: antenatal care; APGAR: Appearance, Pulse, Grimace, Activity, and Respiration; CBC: Complete blood count; CT: Computerized tomography; COVID-19: coronavirus disease; CXR: Chest x-ray; ESR: erythrocyte sedimentation rate; FHB: Fetal heartbeat; HBsAg: Hepatitis B surface antigen; RBC: Red blood cell; RBS: Random blood sugar; TB: tuberculosis; VDRL Venereal Disease Research Laboratory; WBC: white blood cell; VATS: video-assisted thoracoscopic surgery

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REFERENCES

1. Mohammadi A, Ghasemi Rad M, Afrasiabi K. Spontaneous pneumothorax in pregnancy: a case report. Tüberküloz ve Toraks Dergisi 2011; 59(4): 396-398
2. Jain, P., Goswami, K. Recurrent spontaneous pneumothorax during pregnancy: a case report. *J Med Case Reports* **3**, 81 (2009). https://doi.org/10.1186/1752-1947-3-81
3. Lateef N, Dawood M, Sharma K, Tauseef A, Munir MA, Godbout E. Recurrent spontaneous pneumothorax in pregnancy - a case report and review of literature. J Community Hosp Intern Med Perspect. 2018 Jun 12;8(3):115-118. doi: 10.1080/20009666.2018.1472514. PMID: 29915647; PMCID: PMC5998285.
4. M.C. Cardoso, M.I. Raposo, C. Gaio-Lima, P. Ferreira, P. Cosme, Primary spontaneous pneumothorax during pregnancy: A case report and review of the literature, 2022,ISSN 2341-1929,https://doi.org/10.1016/
5. Akanni BA, Gold I, Nwafor IA, Eze JC. Management of spontaneous pneumothorax in pregnancy in a low-income country during COVID-19 pandemic. Niger J Med 2021; 30:342-5.
6. Garg *et al*. Spontaneous pneumothorax: An unusual complication of pregnancy – A case report and review of literature. *Annals of* **Thoracic Medicine** - Vol 3, Issue 3, July-September 2008
7. Georgopapadakos N, Lioumpas D, Mpenakis G, et al. Primary Spontaneous Pneumothorax in a 32-Week Complicated Pregnancy. Cureus,2021; 13(5): e15037. DOI 10.7759/cureus.15037
8. Kavurmacı et al. Pneumothorax and Pregnancy. Turk Thorac J 2019; 20(3): 206-8
9. Shafique MS et al. Recurrent spontaneous pneumothorax in pregnancy - a case report. Int Surg J. 2021 Nov;8(11):3449-3451
10. Runlei Hu, Hu Li, Guoqing Wang. Surgical treatment for recurrent spontaneous pneumothorax during twin pregnancy under video-assisted thoracoscopic surgery (VATS). *Thorac Dis 2010; 2: 178-179.*
11. Pinto RM, Mahankali S, Prasanna BS, Ramkumar MM. Spontaneous pneumothorax in pregnancy: A challenge for anaesthesiologist. J Obstet Anaesth Crit Care 2017; 7:106-8.
12. Agrafiotis AC, Assouad J, Lardinois I, Markou GA. Pneumothorax and Pregnancy: A Systematic Review of the Current Literature and Proposal of Treatment Recommendations. Thorac Cardiovasc Surg. 2021 Jan;69(1):95-100. doi: 10.1055/s-0040-1702160. Epub 2020 Mar 21. PMID: 32199405.
13. Uzun, Işıl and Has, Recep and Kalelioglu, Ibrahim and Yildirim, Alkan. Spontaneous Pneumothorax in A Pregnant Patient Leading to Fetal Demise. *İstanbul Med J* 2013; 14: 289-90.