



## Case Report

# Tension and Recurrent Spontaneous Pneumothorax during Pregnancy: A Case Report

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### Abstract

Pneumothorax in pregnancy is uncommon but potentially devastating condition as tension pneumothorax can result with sudden respiratory compromise. We herein report a case of a 29-year old Kuwaiti primigravida with tension and recurrent spontaneous pneumothorax during the first and second trimesters of pregnancy, which was managed with intercostal chest drain on two occasions. There is no approved guideline to manage this condition during pregnancy. Treatment options include conservative with chest drain and surgical, which includes either video-assisted thoracoscopy or thoracotomy.

**Keywords:** Spontaneous Pneumothorax; Pregnancy; Case Report; Chest Drain

**Synopsis:** Spontaneous pneumothorax should be considered in any pregnant woman presenting with chest pain and dyspnea. Neglecting such condition can result in respiratory compromise and maternal death.

### Introduction

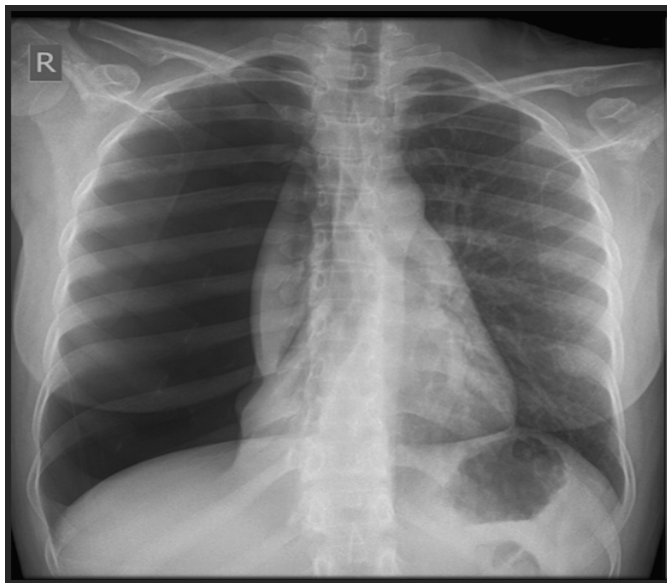
Spontaneous pneumothorax is a rare pathological condition during pregnancy, which results from an accumulation of air in the pleural space between the lung and chest wall leading to a sudden collapse of bulla or bleb [1,2]. The most common cause of spontaneous pneumothorax in pregnancy is a rupture of sub-pleural apical bulla or bleb in an otherwise healthy lung with no previous pulmonary disease [2-4]. Due to physiological changes in pregnancy, any condition leads to impaired ventilation will be poorly tolerated [3]. These physiological changes can accelerate the respiratory pattern and stress sub-pleural apical blebs leading to rupture [4]. True incidence of pneumothorax during pregnancy is unknown [2]. Overall incidence of pneumothorax in pregnancy is low, with only around 56 cases reported previously [1]. A retrospective study, which was done in 2007, documented a low prevalence of pneumothorax in pregnancy with 2% (5/ 250 cases of pneumothorax) [5]. In this case, report we describe a case of spontaneous pneumothorax during pregnancy occurring

in a healthy primigravida during the first and second trimesters, which was treated with chest tube insertion and resulted with good maternal and fetal outcomes.

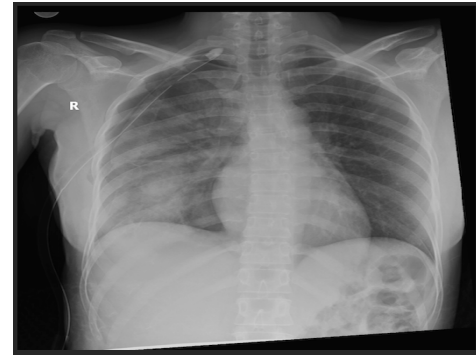
### Case Presentation

29 year-old Kuwaiti G6 P0 A5 L0, at 38 weeks' gestation, presented to Sabah Maternity emergency department with rupture of membrane. Her vital signs were within normal range. On examination, patient was conscious alert oriented, fetal heart was 129 beat per minutes, fundal level matching with date, per vaginal exam revealed vertex presentation with 3 cm cervical dilatation and definite leaking of clear liquor. Her medical history was significant for anti-phospholipid syndrome for which she was on prophylactic dose of enoxaparin 0.4 ml OD. In addition to that, she had two episodes of spontaneous pneumothorax during the current pregnancy. Regarding the first episode, the patient presented to Adan governmental hospital at 6 weeks' gestation with shortness of breath, chest radiograph with the abdominal shield obtained and confirmed right-sided tension pneumothorax and chest tube was placed (Figures 1 and 2). The patient was reviewed by a chest surgeon, and discharged on Heimlich valve for two weeks. Later, she was re-admitted at 10 weeks' gestation for Heimlich valve removal. The patient presented again to Adan hospital at 26 weeks' gestation with right-sided chest pain and shortness of breath. Chest X-ray (CXR) was done, and right-sided recurrent spontaneous apical pneumothorax was diagnosed, for which chest tube was

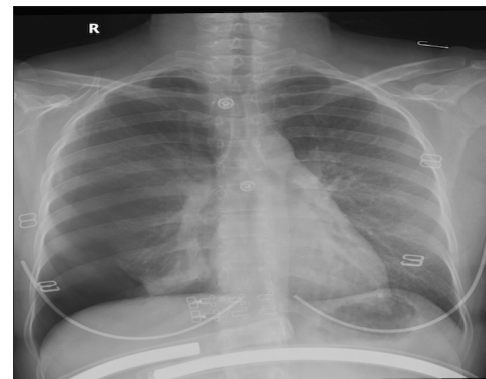
inserted (Figures 3 and 4). Three days later, the patient was transferred to a tertiary care center, chest hospital, for continuous care. The patient gradually improved and repeated CXR showed complete right lung re-expansion. Chest tube was removed after 12 days. The patient's condition was stabilized and she was discharged home with a plan of performing a CXR postpartum or once the patient is symptomatic. Upon her presentation to the Maternity hospital, the patient was admitted to the labor and delivery ward. She had prolonged latent phase of labor, which was augmented with Syntocinon. Once she was in active stage of labor, epidural analgesia received for pain control and she was shifted to the intensive care unit (ICU) for observation and delivery. In the ICU, she was kept on continuous cardiac monitor, invasive arterial blood pressure, hourly input and output chart, and Ringer Lactate 80 ml/hour. Laboratory investigations (CBC, serum electrolytes, LFT, coagulation profile) and Electrocardiograph were performed 8 hourly. After normal labor progression, the patient had normal vaginal delivery with an outcome of alive boy with a birth weight of 2,850 Kg and Apgar score of 8 at 1 minute and 9 at 5 minutes. First-degree vaginal tear was repaired. During the postpartum period, she was asymptomatic with normal vital signs. Chest radiograph was done with normal findings and she was discharged in a good condition with a total of three days of hospital stay. The patient followed up with the chest surgeon in the outpatient clinic and surgical intervention was recommended prior to subsequent pregnancy (not done yet).



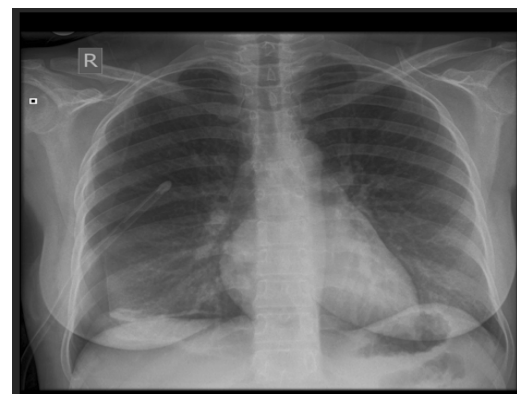
**Figure 1:** Chest radiograph showing a right-sided tension pneumothorax with collapsed lung.



**Figure 2:** Chest radiograph showing resolved right-sided pneumothorax after chest drain insertion.



**Figure 3:** Recurrence of right-sided pneumothorax after initial presentation.



**Figure 4:** Chest radiograph showing resolved right-sided pneumothorax after chest drain insertion.

## Discussion

Spontaneous primary pneumothorax is an uncommon pathology during pregnancy, however, accurate diagnosis is essential as tension pneumothorax can result and present with sudden respiratory compromise [3,6]. Pneumothorax should be

excluded in any pregnant women experiencing chest pain and dyspnea [3]. A review of 82 patients showed that patients with spontaneous pneumothorax during pregnancy were with the average age of 26.6 years-old, and low gravidity of one to two which is consistent with our patient who is 29 years old and primigravida [1,2,7]. It has been documented in several studies that the rate of pneumothorax during pregnancy was higher during the third trimester and postpartum period (55%), compared to the first and second trimesters (45%) [2,13]. In contrast to our patient, who presented with spontaneous pneumothorax twice during the first and second trimesters. Risk factors commonly associated in pregnant patients with pneumothorax were asthma, cocaine use, smoking, hyperemesis gravidarum, previous history of pneumothorax (44%), and underlying infection (30%) [1,8]. Positive risk factors in our patient included hyperemesis gravidarum during the first trimester and recurrent pneumothorax during the second trimester. The majority of patients with spontaneous pneumothorax presented with pleuritic chest pain and dyspnea. The results were similar to our case where the patient presented with chest pain and dyspnea [2,3,9]. Chest radiograph should be considered in any pregnant women presented with pleuritic chest pain and dyspnea. A standard 2-view film is associated with only 0.00007 rad radiation exposure, while the accepted cumulative dose of ionizing radiation safely permitted during pregnancy is 5 rad [6]. Chest radiograph can be safely performed during pregnancy with shielded abdomen [2]. Recurrence risk is around 30-40% especially during labor [10]. Recurrence risk during pregnancy is high and majority occurring during same pregnancy and parturition [10]. Likewise, our patient experienced pneumothorax twice during antenatal period. Treatment of pneumothorax during pregnancy is controversial. Generally, the same treatment criteria used for non-pregnancy applies to pregnant patients [2]. Initial treatment was observation only in 23%-30% of cases [1,2,7]. Eight percent of them had resolution compared to 37.5%, who required tube thoracotomy [2]. Admission and observation were usually done for those with small pneumothorax (less than 2 cm), and with no maternal or fetal compromise [7].

Up to 75% of cases treated with chest tube drainage as first-line treatment, which is similar to our case [3]. Surgery should be considered in persistent or recurrent disease despite adequate drainage [3]. Either surgical approach can be by thoracotomy or video assisted thoracic surgery (VATS), with pleurectomy or pleurodesis [11]. Our patient was treated successfully with chest tube antenatally and surgery is preserved postnatally. Intrapartum preventative measures to reduce increased intrathoracic pressure during labor were adequate analgesia and elective instrumental delivery to shorten the second stage of labor and maternal expulsive efforts [3,11]. Additionally, nitrous oxide for intrapartum pain relief should be avoided as it can exacerbate tension pneumothorax [12]. If C-Section is required, general anesthesia should be

avoided as positive pressure ventilation can increase air leak [13]. Our patient received epidural analgesia once in active stage of labor and had short second stage of labor with minimal maternal effort. No absolute indication for C-section specifically related to spontaneous pneumothorax [1,2]. Mode of delivery should be selected only for obstetric indications. A review of 45 cases of spontaneous pneumothorax during pregnancy documented good obstetric outcomes with 86% had vaginal delivery and 14% had elective C-Section. No neonatal complications were reported [2]. Our patient presented to the causality in labor and had normal vaginal delivery. Persistent pneumothorax requires definitive surgical treatment after delivery in order to prevent recurrence in subsequent pregnancies [14]. And our patient was advised to follow up with chest surgeon for surgical intervention.

## Conclusion

Spontaneous pneumothorax during pregnancy, although rare, should not be neglected in a patient who presented with pleuritic chest pain and dyspnea. The management of pneumothorax in pregnancy is similar to general population. There is no absolute indication for C-Section and the best approach for delivery is elective-assisted delivery. Overall, the prognosis is good for both the mother and the fetus.

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**Author contributions:** Dr. Zahraa Akbar suggested the original idea, which was discussed with Dr. Abdolmohsen and Dr. Taiba. Participated in writing the paper, design and retrieving the chest X-ray images from Adan and Chest Hospitals. Carried out article publication process. Dr. Taiba Buolayyan participated in writing the paper and retrieved the chest X-ray images from the Maternity Hospital. Dr. Abdolmohsen Alanjari is the treating obstetrician who was following up the patient in the outpatient clinic. He provided technical help in downloading the images. Provided revision to manuscript content and approved the final manuscript.

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