

Spontaneous Pneumothorax and Delivery. A Case Report

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Abstract

The onset of spontaneous Pneumothorax during pregnancy is uncommon. However, due to the physical changes of the respiratory system during pregnancy, any entity that causes an alteration in ventilation, seriously affects both the pregnant woman and the fetus. Pneumothorax should be excluded when presented with a woman with dyspnea and chest pain.

We report the case of a multiparous woman at 39 weeks gestation who presented a spontaneous pneumothorax. After admission to the ICU and placement of a pleural tube with a Heimlich valve, labor began. Epidural analgesia was used, labor was actively managed. A healthy child was born after instrumental delivery. Postpartum had a normal evolution, two days later, the thoracic tube was removed, and the mother referred for definitive surgical treatment.

Keywords: Spontaneous Pneumothorax; Pregnancy; Labor; Dyspnea; Chest Pain

Abbreviations

SP: Spontaneous Pneumothorax; EFM: Electronic Fetal Monitoring; ICU: Intensive Care Unit; XR: X-Ray, Radiography

Introduction

A spontaneous pneumothorax (SP) is defined as the accumulation of gas in the pleural space that can result in the partial or complete collapse of a lung. Primary SP usually occurs after the rupture of a small sac full of air call "bleb", its primary cause is unknown.

Clinically, the symptoms that may accompany SP are acute and sudden chest pain on the side of the collapsed lung, which worsens with deep inspiration or cough, chest tightness, respiratory distress, tendency to fatigue, tachycardia and cyanosis. Other symptoms that may be present are nasal flaring, anxiety and hypotension.

The appearance of a pneumothorax during pregnancy is a very rare condition. Among risk factors associated are: asthma, respiratory infections, history of pneumothorax, hormonal changes, modifications in intra thoracic pressure and drug use or smoking.

The increase in oxygen demands caused by both pregnancy (20%) and delivery (50%) means that any problem that affects ventilation can have serious consequences for both the mother and the fetus [3,5,6].

During pregnancy SP appears 50% of the time at term or intra partum. Only 45 cases have been reported in pregnant women, 10 during labor [5,6]. We have not found data on its prevalence or incidence in Spain. The symptoms reported are the usual for pneumothorax: shortness of breath and chest pain. The physical examination presents: tachypnea, tachycardia, cyanosis and decreased breath sounds. Chest x-ray will confirm the diagnosis, which is safe during pregnancy with abdominal shield [2-4,7].

Treatment

The main risks of pneumothorax during pregnancy are respiratory compromise and preterm delivery [3]. Management and mode of termination are controversial. Treatment criteria is the same as for non-pregnant women. When the SP is small (< 20% hemithorax) conservative treatment with oxygen supplements and painkillers will be provided, as long as it is well tolerated by both mother and fetus. It will always require hospital admission and close supervision. If it is larger or poorly tolerated, causing significant dyspnea, it will be treated by aspiration or insertion of a thoracic drain [3,8].

Surgical treatment would be indicated in case of recurrence. The second trimester is the safest for carrying out the procedure. During the third trimester, surgery can be associated with preterm labor, which is why some authors recommend to maintain pleural drainage and wait to perform it at 5th-10th day postpartum [3,6]. However, other authors point out that postpartum surgery compromises the normal interaction between mother and child and therefore they recommend a safe and definitive surgical procedure before delivery, or to inform the family so they can make an informed decision [8].

Regarding mode of birth, most authors agree that vaginal delivery is safe. In order to prevent the increase of intra thoracic pressure and abbreviate expulsion instrumental delivery and epidural analgesia are recommended. Both avoid the recurrence of pneumothorax. Caesarean section is not the choice treatment [2-4].

The risk of recurrence is higher in pregnant women than in the general population, reaching 44%. Most of the time, it happens during the same gestation or in the postpartum period. However, the prognosis of pneumothorax during pregnancy is good, both for the mother and the fetus, provided that an accurate diagnosis is made and adequate treatment is established [2-4,7].

Case Report

A multigravida at 39 weeks gestation was admitted at 1:00 am to the emergency department at Valme University Hospital, with complaint of left chest pain that increases with inspiration accompanied by dyspnea, of one hour of evolution.

General assessment

After interview and Pregnant Women's Health Document review, the following information was extracted.

Personal history:

- Allergy to Metamizole.
- Has not smoked in the last 3 years.
- Left pneumothorax drained with thoracostomy tube 15 months ago.
- Left pneumothorax (< 5% hemithorax) SP at 33+4 weeks gestation. Admitted to hospital for observation and radiological control with expectant attitude due to pregnancy and small extension. It resolved spontaneously after 5 days of hospital admission. At Obstetric level, it had no impact on uterine dynamics, so it only required surveillance of fetal well-being with EFM and ultrasound control.

Family history: No clinical interest.

Obstetric history

Gravida: 3, Para: 0, Abortions: 2, Current pregnancy at 39 weeks gestation with normal evolution, categorized at first visit as low risk. Ultrasounds and pregnancy controls reveal normal fetal growth and development. The amniotic fluid and implantation of the placenta are also normal after a first episode of pneumothorax in the course of this gestation.

Upon arrival at the hospital, the following assessment was made:

- Physical exploration: Acceptable general condition. Good skin and mucous membranes color. Light tachypnea HR: 95 beat per min. No murmurs. Blood Pressure: 140/90 mmHg, normal abdomen. No deep vein thrombosis signs in lower limbs.
- Laboratory tests: Complete blood count, chemistry and coagulation within normal range.
- Thorax XR (x-ray): An aerial camera is observed occupying 40% of left hemithorax with collapsed left lung.

Diagnosis

Left sided pneumothorax (40% extension). The woman was admitted to the intensive care unit (ICU), where a pleural tube with a Heimlich valve (thoracotomy or closed pleurotomy) was placed. Fetal wellbeing was checked by the obstetric team. An Electronic Fetal Monitoring (EFM) was performed resulting in fetal reactivity and regular uterine dynamic. After vaginal examination a second diagnosis of active phase of labor was established.

Evolution

Four hours after the placement of the drainage tube in the ICU and the improvement of the respiratory signs, the woman alerts the nurses of uterine contractions. The obstetric team performed an EFM that results in a reactive fetal pattern and regular uterine contractions. The ultrasound presented a single fetus with positive cardiac activity and fetal movements, concordant biometrics and estimated fetal weight of 3600 grs. Placenta normally implanted and normal levels of amniotic fluid. At the vaginal examination the cervix was dilated 3 centimeters, effaced, centered with intact fetal membranes. The diagnosis of active phase of labor was established and the woman transferred to the delivery ward.

At the delivery ward at 5:00 a.m. the woman presented chest pain at the thoracotomy puncture site (4th inter costal space in the mid axillary line) as well as from the uterine contractions (visual analgesic scale, EVA 9/10). At 5:30 a.m. the anesthesia team was contacted and an epidural catheter placed without incidences. Intravenous analgesia with pethidine plus haloperidol was also used as the intensity of pain chest was higher than that of the contractions (EVA 7). After analgesia, pain labels were as follows: uterine contractions EVA (0/10) puncture site (4/10).

Labor was actively managed with amniotomy at 6:15 am. Amniotic fluid was clear. Oxytocin augmentation (5ui in 500cc of Ringer Lactate) started at 7:45 am at an initial dose of 2 mui/min that was not necessary to increase due to good uterine dynamic. After a normal active labor phase, with a reactive fetus pattern in the EFM and no incidents, the expulsive period was reached at 1:00 p.m. A passive descent of the presentation was allowed for 40m. Birth took place at 1:40 pm. instrumentally by forceps to shorten the expulsive period and limit bids that could aggravate the pulmonary collapse. The expulsion of the placenta was spontaneous, and 20 IU of oxytocin were administered in 500cc of Ringer Lactate without hemorrhagic complications.

Results and Discussion

Operative vaginal delivery was performed by forceps to shorten expulsive phase.

Newborn male of 3300 grs, Apgar 8/10 who did not require admission at the Neonatal Unit. Cord blood sample ph 7:30.

A mediolateral episiotomy was performed with third degree tear type B.

Follow up

At 16:45 pm in the postpartum ward the chest drain come out spontaneously requiring reposition. Woman breathed normally after 24 hrs of delivery. No supplemental oxygen was needed. There was no fever. The lungs appear expanded in the thorax XR. At 36 hours no

new air leakage was seen. After 72 hours the tube was removed. The referral hospital was contacted and there was agreement for video assisted thoracoscopic surgery, which was performed a week after childbirth without complications.

Two years later there have been no new episodes of pneumothorax.

Conclusion

It is very unusual to find a SP in a pregnant woman during labor in daily practice. It is important to report its signs and management in order to be ready to face a case like the one presented.

The obstetric team at the maternity wards must be aware of the clinical suspicion of SP in the presence of certain symptoms as it is hardly predictable. The diagnosis of pneumothorax should be considered in the differential diagnosis of pregnant women experiencing chest pain and dyspnea. These Symptoms could otherwise be attributed to discomfort of pregnancy. An early and proper diagnosis of SP is fundamental for its management during pregnancy to avoid the risk of respiratory compromise and preterm delivery.

During labor pain control plays a very important role, both of uterine contractions and puncture site, in order to reduce oxygen demands, this could aggravate the condition, and compromise fetal oxygenation. Vaginal instrumental delivery and epidural analgesia are recommended in order to avoid worsening the pulmonary collapse.

Addressing psychological aspects and fear is also important aspect Timely and appropriate information of the process and evolution are essential.

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