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Spontaneous Neonatal Pneumomediastinum - A Case Report

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ABSTRACT

Neonatal pneumomediastinum has been found to occur in approximately 2.5 per 1000 live births. It is a benign and self-limiting condition in neonates. It can be symptomatic or asymptomatic but resolves with appropriate supportive and conservative treatment. Close monitoring in such babies is essential.
In this case report, presenting a boy baby born by an uncomplicated normal vaginal delivery with no resuscitation manoeuvres required and a good APGAR score of 8/10 and 9/10 at 1 minute and at 5 minutes of life. This baby was having tachypnoea since the time of birth which worsened to respiratory distress with grunting and intercostal retractions by 2 hours of life. A Chest X ray was done, which showed pneumomediastinum. As the baby was not maintaining saturation with hood box oxygen and the distress was quite severe, we started high flow oxygen by nasal cannula. As the saturation was maintaining and there was clinical improvement in the baby, the high flow oxygen was gradually weaned off by Day 11 of life and the baby was discharged in a stable state.
Pneumomediastinum is a diagnosis made by clinical observation as well as by radiology. Though it is a benign condition, an oxygen rich environment is the main stay of treatment and close observation for worsening distress or development of pneumothorax / subcutaneous or interstitial emphysema is necessary.
In this case, baby developed the pneumomediastinum spontaneously with no antenatal or perinatal risk factors. The vigorous respiratory efforts by the baby and vigorous crying at birth led to alveolar rupture, thereby leading to the pneumomediastinum. The pneumomediastinum was so severe that it took 11 days to resolve completely.

Key Words: pneumomediastinum, spontaneous, neonatal, oxygen

CASE REPORT

A boy baby was born at 38 weeks of gestation by normal vaginal delivery with birth weight of 3.34kg. Baby cried immediately after birth and did not require any resuscitation. The APGAR score was 8 at 1 minute of birth and 9 at 5 minutes of life. Baby was having tachypnoea since the time of birth. At 2 hours of life, baby developed respiratory distress with intercostal retractions and grunting along with the tachypnea. Baby was hence admitted in NICU and a Chest X-Ray was done which showed Pneumomediastinum (Figures 1 and 2).

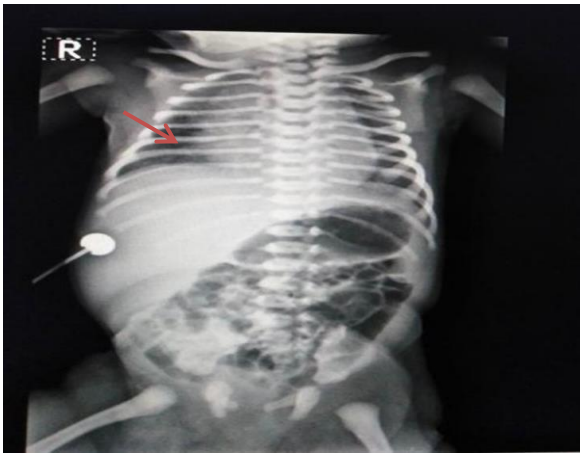

Figure 1. Hyperinflated area in the right middle lobe (Red Arrow). Homogenous subtle opacities in right upper and lower zones, moderate dilatation of bowel loops

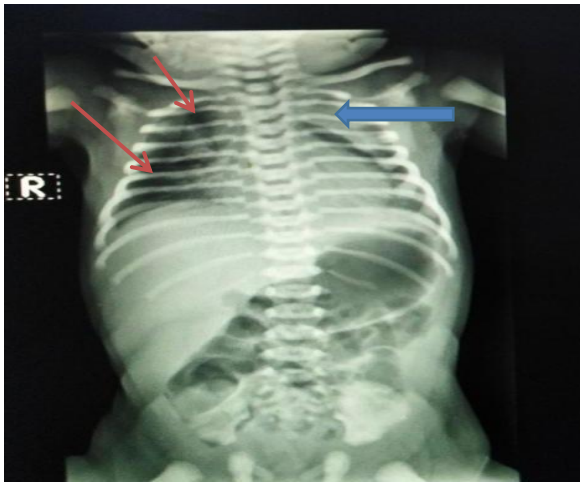

Figure 2. Hyperinflated area in the right upper and middle lobes (Red Arrows). Homogenous opacity in the left upper zone (Blue Arrow).

As the baby was having respiratory distress, baby was first started on high flow oxygen by hood. As baby was not maintaining appropriate saturation of >92% in spite of high flow oxygen by hood, HFNC (High Flow Nasal Cannula oxygen) at FiO2 of 70% with Flow of 7L/min was started and then the saturation was maintained appropriately. Over the days, as the distress was resolving, HFNC settings were reduced and weaned off by Day 5 of life. But, as soon as the HFNC was weaned off, the distress worsened with tachypnea and intercostal retractions and thus, the baby had to be put back on HFNC at FiO2 50% and Flow 5L/min, which was continued for three more days. Repeat Chest X ray was done to find out the status of the pneumomediastinum and it showed a resolving pneumomediastinum (Figure 3).

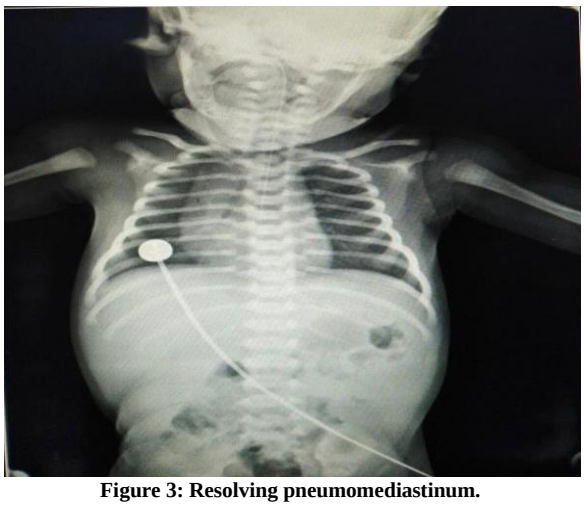

Figure 3: Resolving pneumomediastinum.

HFNC settings were then reduced gradually and weaned off by Day 10 of life, following which baby was maintaining saturation of >92% in room air and was not having any tachypnea or distress.

Baby was then discharged by Day 11 of life in a stable condition.

REVIEW OF LITERATURE

Pneumomediastinum is a benign and self-limiting condition in neonates. Neonatal pneumomediastinum has been found to occur in approximately 2.5 per 1000 live births and in about 0.1% of neonates admitted in intensive care units (1).

It can be symptomatic or asymptomatic but resolves with appropriate supportive and conservative treatment (2).

Pneumomediastinum can be spontaneous in which there is no obvious cause or it can be traumatic in which a predisposing factor is the cause of it. Spontaneous pneumomediastinum is an atraumatic mediastinal air-leak without an underlying lung disease (3).

A number of neonates with pneumomediastinum are associated with prematurity and treatment for surfactant deficiency. Though in term newborns, predisposing factors include labour-related trauma, positive pressure during resuscitation or mechanical ventilation, meconium aspiration syndrome or pneumonia (1).

Neonatal pneumomediastinum is diagnosed with accurate clinical findings as well as with imaging. Prompt diagnosis is important for the newborn's management. Usually, the diagnosis of spontaneous pneumomediastinum is not suspected without imaging (3).

On an X ray, a pneumomediastinum typically appears as radiolucent air collections which outline the thymus. (5) In some cases in which the radiographic appearances are atypical, CT may further characterize such radiolucencies which may be located medially or posteriorly (2).

In a study, pneumomediastinum was seen in newborns with an apparent predisposing factor like intubation, meconium-stained amniotic fluid and congenital anomalies. There was no significant correlation with prematurity, dysmaturity, small size for age, cesarean section, or hyaline membrane disease (1).

Spontaneous neonatal pneumomediastinum occurs due to air leak as a result of increase in alveolar pressure. It is not common after uncomplicated deliveries (1). In such cases, the pressure gradient between the alveolar and perivascular space could increase abnormally high even during vigorous crying of the baby which can lead to alveolar rupture. The baby is usually asymptomatic, but respiratory distress or persistent grunting can be the common clinical signs which should not be ignored (4).

Babies with pneumomediastinum need to be observed closely and continuously monitored, though some severe cases may need drainage and/or mechanical ventilation and/or high-frequency oscillatory ventilation (HFOV), depending on the degree of respiratory compromise caused by the air leak and the severity of the respiratory distress. Inserting a drain into the mediastinum should be avoided as it may cause more of a problem than to solve and it will not be beneficial. If the pneumomediastinum is clinically significant, an oxygen-rich environment can be used in the term baby to attempt nitrogen washout (5).

CONCLUSION

In this case, baby developed the pneumomediastinum spontaneously with no antenatal or perinatal risk factors. The vigorous respiratory efforts by the baby and vigorous crying at birth led to alveolar rupture, thereby leading to the pneumomediastinum. The pneumomediastinum was so severe that it took 11 days in an oxygen-rich environment to resolve completely.

Conservative treatment is the mainstay of treatment and close follow-up until resolution is required because of the potential risk of pneumothorax, subcutaneous emphysema and interstitial emphysema with deteriorating clinical status.

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