Case Report

Spontaneous neonatal pneumomediastinum: A Case Report

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ABSTRACT:
Radiolucency in mediastinum may be caused by congenital cystic mass, pneumomediastinum or pneumopericardium. Most cases of pneumomediastinum occur in preterm newborns with surfactant deficiency receiving treatment with positive pressure ventilation. Spontaneous pneumomediastinum in term neonates is rarely reported.

Key words: Spontaneous pneumomediastinum, superior medistinal mass, Spinnaker sail sign.

INTRODUCTION:
Pneumomediastinum (PM) is defined as a mediastinal air leak. The experimental works of Macklin and Macklin provided insights into its pathophysiology; alveolar rupture occurs because of a pressure gradient between the alveoli and the surrounding tissues. This gradient develops either through over inflation of the alveolus or a reduction of interstitial pressure. The air that subsequently leaks into the interstitial tissue diffuses toward the peribronchial and perivascular tissue, and then towards the mediastinum, the neck and into the subcutaneous tissue. However, due to pressure equalization between the affected and adjacent alveoli in the lungs, the interalveolar walls remain intact and the lungs inflated. 1

Spontaneous pneumomediastinum in term neonates is rarely reported. 2

Radiolucency in mediastinum may be caused by congenital cystic mass, pneumomediastinum or pneumopericardium. Most cases of pneumomediastinum occur in preterm newborns with surfactant deficiency receiving treatment with positive pressure ventilation. 3

Spontaneous neonatal pneumomediastinum (PNM) is associated with the aspiration of blood or meconium and birth-related trauma and it seems to be more frequent in post-term newborns. It is generally asymptomatic, but it is occasionally accompanied by mild tachypnoea. Only rarely, it requires oxygen therapy or develops into pneumothorax. 4

CASE REPORT:
A male baby delivered by normal vaginal delivery to 25 yrs old woman at 38 weeks of gestation with birth weight of 2960 gm and APGAR score of 7 and 9 at 1 and 5 minutes respectively. Baby developed respiratory distress soon after birth requiring oxygen by hood. The distress was progressive in nature, so the baby was shifted to NICU for further management. On admission to NICU Downe’s score was 6 and was maintaining saturation between 95-100% at Fio2of 60%. Baby was hemodynamically stable. Blood culture was send and chest x-ray was done which showed pneumomediastinum. Arterial blood gas analysis showed acceptable level of gas exchange. CT scan was done at 36 hrs of life and it showed anterior pneumomediastinum with superior displacement of thymus. Serial x-rays were obtained at 48 and 72 hrs of life which showed resolution of pneumomediastinum [figure3]. Complete resolution was achieved at 96 hrs of life. Neither mechanical ventilation nor mediastinal drain was required.

DISCUSSION:
Spontaneous pneumomediastinum that occurs in the absence of clearly defined precipitating factors has rarely been reported. Pathogenesis of pneumomediastinum was first demonstrated experimentally by Macklin in 1939. 4 Exposure to an increased pressure gradient between the alveoli and the pulmonary interstitium results in alveolar rupture into the perivascular space at the junctional area between compliant bronchial airway and poorly compliant alveoli. Air dissects along the perivascular sheaths towards the hilum and leaks into loose connective tissue spaces of the mediastinum. The usual triggering agent is positive pressure ventilation in combination with an underlying abnormality such as surfactant deficiency or meconium aspiration syndrome that renders the alveoli more fragile and prone to rupture. 5 In spontaneous pneumomediastinum the pressure gradient is thought to be generated by excessive negative intrapleural pressure during vigorous respiratory efforts in term infants, coupled with an uneven inflation of alveoli at birth. This is the most plausible explanation in our infant. Most cases of spontaneous pneumomediastinum resolve spontaneously. Timely recognition and avoidance of aggravating factors constitute the crux of management and prevent deterioration and hemodynamic instability. 6

CONCLUSION:
Neonatal pneumomediastinum can be confused with surgical cystic radiolucent mass owing to the unique anatomical feature of the neonatal thymus characterized by a thick
enveloping fascial capsule that contains air. Awareness of spontaneous pneumomediastinum in newborn babies with respiratory distress helps to direct the nature of respiratory support and the mode of transport. With timely recognition and avoidance of aggravating factors, most cases resolve spontaneously.

REFERENCES:

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X-ray at 4hrs X-ray at 72 hrs shows resolution X-ray at 96 hrs shows complete resolution

CT Thorax s/o Anterior Pneumomediastinum