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Imaging Series of Breathing Challenges Before Birth: Exploring Fetal Respiratory Anamolies

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Abstract: ***CHAOS: Characterized by upper airway obstruction, displaying features such as dilated trachea and enlarged echogenic lungs. CPAM: Multicystic lung tissue with increased echogenicity and small cystic spaces, particularly noted in Type II. PULMONARY SEQUESTRATION: Aberrant lung tissue without bronchial or pulmonary artery connection, often identified with a feeding vessel on ultrasound.***

Keywords: Congenital lung anomalies Prenatal imaging Ultrasound, Lung agenesis, CPAM (congenital pulmonary airway malformations) Lobar overinflation, Bronchial atresia, Bronchogenic cysts, CHAOS (congenital high airway obstruction syndrome) Lung sequestration, Diagnosis, Postnatal evaluation

1. Introduction

1) Congenital lung abnormalities are being detected more frequently at routine high-resolution prenatal ultrasonography and various imaging modalities.
2) The most commonly encountered anomalies include
   - Lung agenesis-hypoplasia complex (pulmonary underdevelopment),
   - Congenital pulmonary airway malformations,
   - Congenital lobar over inflation,
   - Bronchial atresia, bronchogenic cysts, congenital high airway obstruction syndrome, scimitar syndrome, and Broncho pulmonary sequestration

2. Objectives

- Provide a differential diagnosis for a congenital lung mass on prenatal ultrasound.
- Discuss an appropriate postnatal workup for congenital chest mass lesions, and list two reasons for surgical resection.
- Recognize temporal changes in degree of opacification of congenital lobar overinflation (CLO) on chest radiography.
- Recognize pathophysiologic factors and congenital associations impacting survival with diagnosis of congenital diaphragmatic hernia.
- Recognize findings on prenatal imaging that indicate favorable prognosis in the context of congenital diaphragmatic hernia

3. Materials and Methods

In our study, patients referred to Department of Radio-Diagnosis, Narayana Medical College Nellore from APRIL 2023- September 2023 as suspected congenital abnormality of the lung, were evaluated with various imaging modalities. Patients were followed up for maximum 6 months.

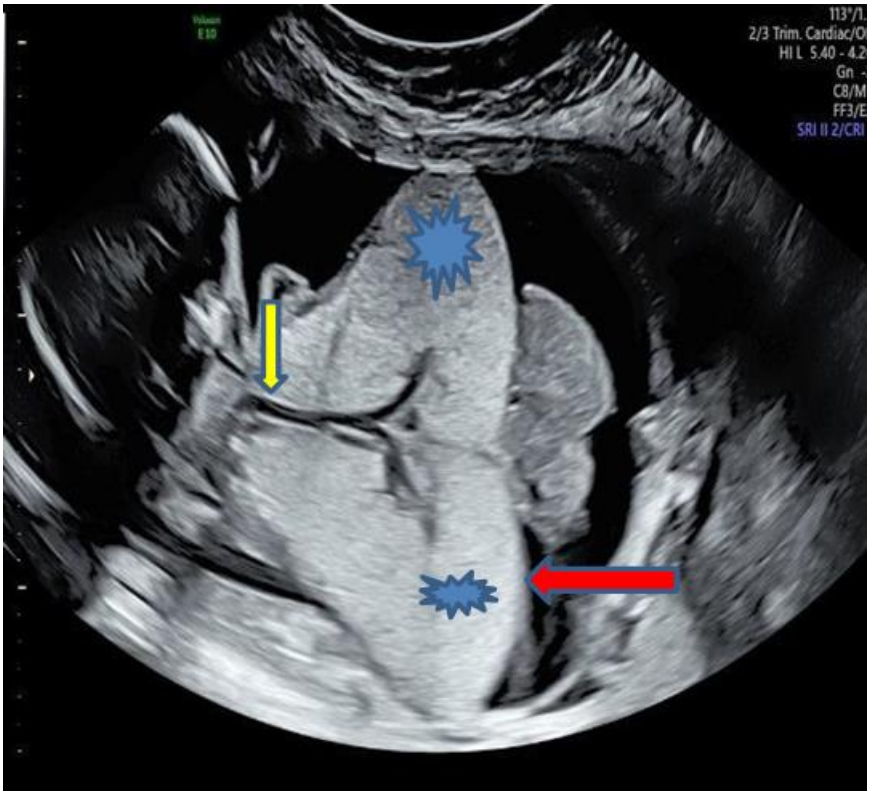
Congenital high airway obstruction syndrome or sequence (CHAOS) refers to a rare, often lethal, congenital laryngotracheal condition and is primarily characterized by obstruction to the fetal upper airway.

Antenatal ultrasound

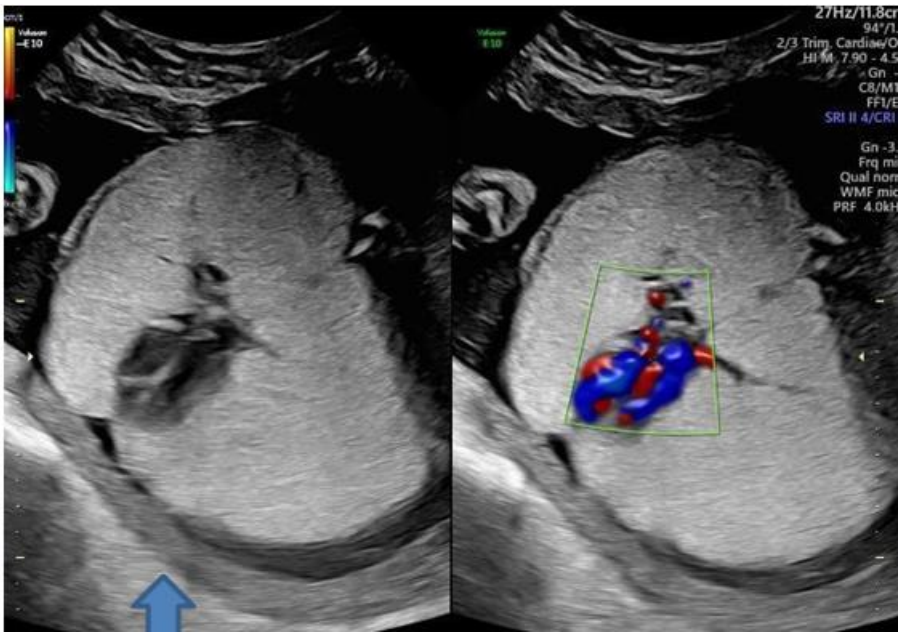
Ultrasound may show some or all of the following features [4, 5]: dilated trachea with cut off at upper end

with bilateral enlarged echogenic lungs

() with diaphragmatic inversion and/or flattening (ascites).



Antenatal USG in transverse plane shows centrally positioned and compressed heart.(Arrow)



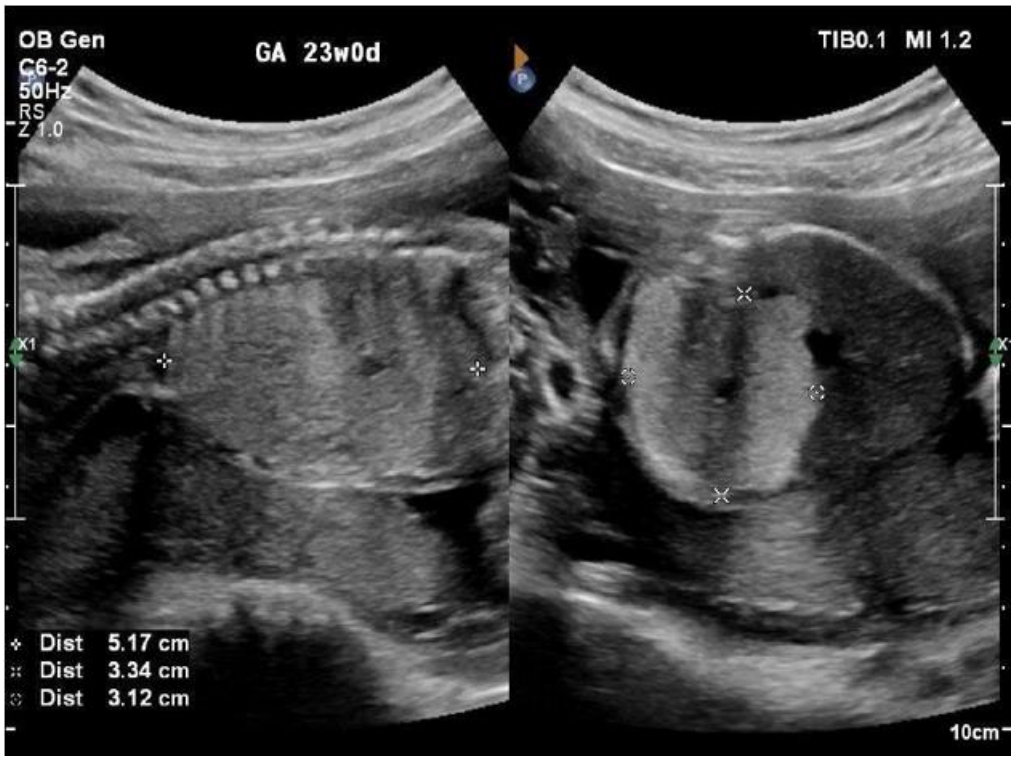
Congenital pulmonary airway malformation

Are multicystic masses of segmental lung tissue with abnormal bronchial proliferation. CPAMs are considered part of the spectrum of bronchopulmonary foregut malformations.

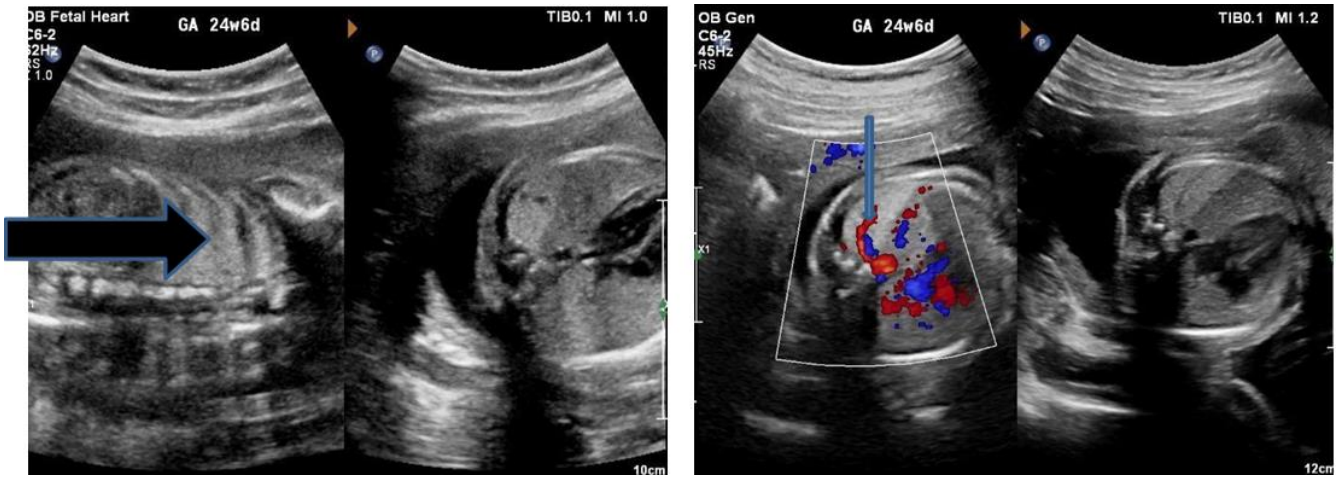
Type II

15-20% of cases[3]cysts are <2 cm in diameter.

The right lung is affected by the CPAM and has increased in echogenicity relative to the left. There has also been the development of a small cystic space in the lung.



Pulmonary sequestration, also called **accessory lung**, refers to the aberrant formation of segmental lung tissue that has no connection with the bronchial tree or pulmonary arteries.



(A) Prenatal ultrasound scan demonstrates extralobar bronchopulmonary sequestration (black) with feeding vessel (white arrow),

4. Conclusion

- Congenital lung abnormalities are being detected more frequently at routine high-resolution prenatal US.
- Recognizing the imaging features of these abnormalities is necessary for prenatal counselling and appropriate peri and postnatal management.

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