

A 3-hour-old boy is evaluated in the newborn nursery due to cyanosis. The infant is cyanotic and tachypneic at rest, but turns pink when he cries. The cyanosis worsens when he attempts to feed. He is voiding normally and passed meconium. His prenatal, birth, and family histories are unremarkable. The infant's weight is appropriate for gestational age. Vital signs, including 4-extremity blood pressures, are normal. Examination shows a non-dysmorphic boy with clear lungs and no murmurs. There are no intercostal retractions or stridor. His peripheral pulses are full and symmetric. Which of the following is the most likely diagnosis?

- ☐ A. Choanal atresia
- ☐ B. Laryngomalacia
- ☐ C. Tetralogy of Fallot
- ☐ D. Tracheoesophageal fistula with esophageal atresia
- ☐ E. Transient tachypnea of the newborn
- ☐ F. Vocal cord paralysis

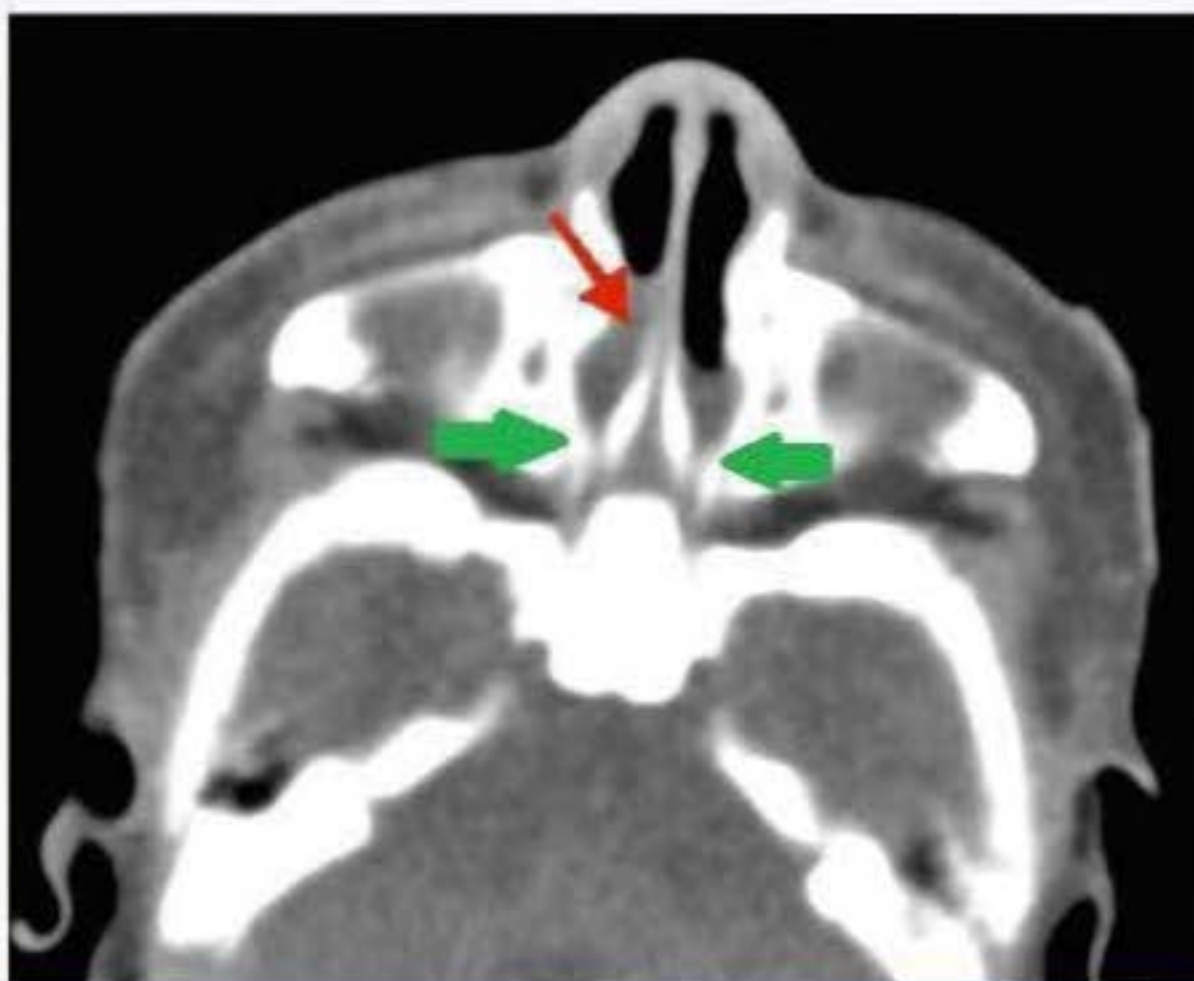
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- ☒ A. Choanal atresia [63%]
- ☐ B. Laryngomalacia [7%]
- ☐ C. Tetralogy of Fallot [13%]
- ☐ D. Tracheoesophageal fistula with esophageal atresia [8%]
- ☐ E. Transient tachypnea of the newborn [8%]
- ☐ F. Vocal cord paralysis [1%]

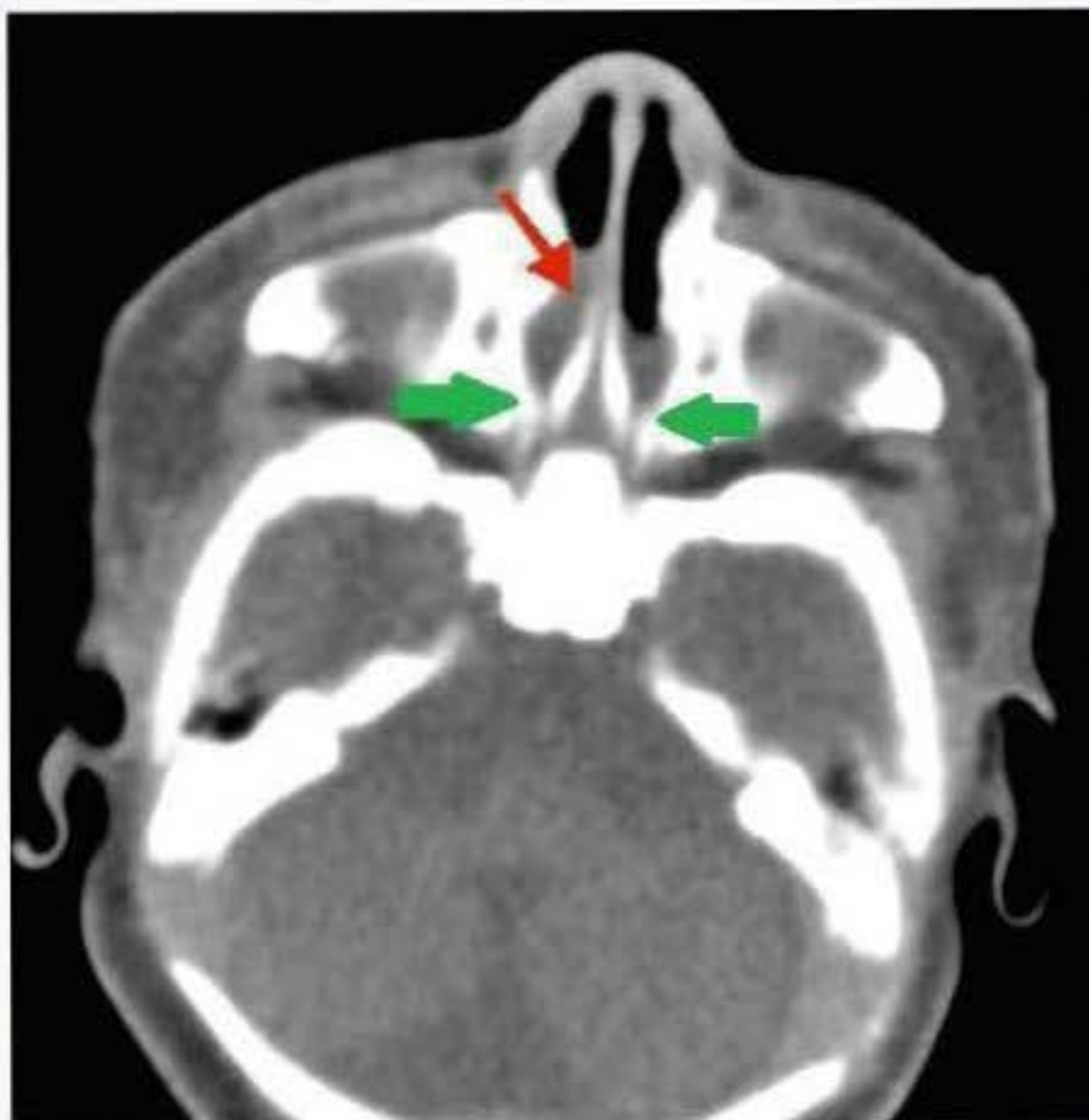
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Choanal atresia should be suspected in a newborn with cyanosis that is aggravated by feeding and relieved by crying. The congenital nasal malformation is caused by failure of the posterior nasal passage to canalize completely, leaving either a bony (90%) or membranous (10%) obstruction. The condition may be isolated or part of a syndrome (ie, CHARGE syndrome: **C**oloboma, **H**earth Defects, **A**tresia choanae, **R**etardation of growth/development, **G**enito-urinary anomalies, and **E**ar abnormalities/deafness).

The clinical severity depends on the infant's ability to breathe through the mouth and whether one or both choanae is/are obstructed. Bilateral obstruction classically presents with **cyclic cyanosis** that worsens when infants cannot breathe through the mouth (eg, during feeding) and recovers when they do (eg, while crying). Unilateral choanal atresia may remain undiagnosed until the development of a first upper respiratory infection.

Failure to pass a catheter through the nares into the oropharynx is suggestive of choanal atresia. The diagnosis is confirmed by CT scan. In contrast to infants with **patent choanae**, infants with choanal atresia have narrowing at the level of the

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Failure to pass a catheter through the nares into the oropharynx is suggestive of choanal atresia. The diagnosis is confirmed by CT scan. In contrast to infants with **patent choanae**, infants with choanal atresia have narrowing at the level of the pterygoid plate in the posterior nasal cavity (as shown by the green arrows in the image above). In severe cases, air-fluid levels (red arrow) may develop at the obstruction site. The first step in management consists of placing an oropharyngeal airway and orogastric tube feeding. Definitive treatment involves repairing the obstruction with surgery or endoscopy.

(Choice B) Laryngomalacia classically presents with inspiratory stridor that is exacerbated by exertion or distress. Symptoms appear within the first few weeks of life. Cyanosis is uncommon unless the obstruction is severe. However, this infant has no stridor or tachypnea.

(Choice C) Patients who have Tetralogy of Fallot (TOF) with mild obstruction of pulmonary blood flow are asymptomatic at rest and become cyanotic when stressed. These desaturations are known as "tet" spells, which may be confused with the cyanosis seen in choanal atresia. However, the cyanosis in choanal atresia is not triggered by stress but by anything keeping the infant's mouth closed (eg, during feedings). Patients with TOF will also have a systolic ejection murmur of pulmonary stenosis and holosystolic murmur of ventricular septal defect. These are not seen in this patient, making TOF diagnosis unlikely.

(Choice D) Tracheoesophageal fistula with esophageal atresia can cause feeding problems immediately after birth as feeds cannot pass the esophagus and end up in the airway. These patients typically have coughing, respiratory distress, and adventitious lung sounds in addition to cyanosis.

(Choice E) Transient tachypnea of the newborn is characterized by tachypnea

endoscopy.

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(Choice E) Transient tachypnea of the newborn is characterized by tachypnea immediately after birth that is unrelated to crying. Additional symptoms include nasal flaring, subcostal/intercostal retractions, and expiratory grunting.

(Choice F) Vocal cord paralysis is associated with birth injury or central nervous system insults. Infants may have unilateral or bilateral paralysis and generally have stridor and respiratory distress. It cannot be clinically differentiated from laryngomalacia; direct visualization of the upper airway via endoscope is necessary. Cyanosis is uncommon unless the obstruction is severe.

Educational objective:

Choanal atresia should be suspected in an otherwise well-appearing infant with cyanosis and distress worsened by feeding and relieved by crying. Failure to pass a catheter through the nose into the oropharynx is suggestive of the diagnosis. A CT scan reveals narrowing at the level of the pterygoid plate in the posterior nasal cavity.

References:

1. [Choanal atresia: Current concepts and controversies.](#)
2. [Nasal obstruction in newborns.](#)

Media Exhibit

choanae

