Stridor and Upper Airway Obstruction in Children

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RJH

In BRIEF

Stridor and Upper Airway Obstruction in Children


Stridor is a high-pitched, crowing noise typically heard on inspiration and generally indicative of upper airway obstruction. Because it may indicate critical reduction in air and, thus, oxygen delivery, it must be assessed promptly and addressed with utmost urgency when airway compromise is imminent.

The evaluation includes a brief history (duration and acuteness; presence of fever; birth, neonatal, and airway instrumentation history; possibility of foreign body) and physical examination best undertaken with the child in the parent’s lap and with the chest visible. It is important to determine the character of the respiratory pattern (eg, sounds of breathing, distress, retractions, flaring, hoarseness) and to observe for anxiety, cyanosis, posturing, swallowing, or drooling.

The pattern of stridor helps to localize the lesion. Inspiratory stridor is at or above the vocal cords and is due to the collapse of the soft tissues with negative pressure during inspiration. Analogous to wheezing, expiratory stridor occurs because of decreased airway caliber with expiration and emanates from the intrathoracic trachea and bronchi. Biphasic stridor, which occurs on inspiration and expiration, indicates unchanging airway caliber due to a fixed lesion, generally related to edema at and near the cricoid cartilage that encircles the trachea.

Because neonatal breathing is predominantly nasal, nasal obstruction is evident soon after birth. Choanal atresia is bilateral in about one third of infants and presents with severe respiratory distress. Unilateral choanal atresia may not be identified for years. Diagnosis is made by failure to pass a catheter through the nares. Fifty percent of cases are associated with other anomalies (eg, CHARGE syndrome). Birth-related septal deviation also may present in infancy, but it resolves with modest manipulation.

Stridor in infants most commonly is due to inspiratory collapse of the laryngeal cartilage with laryngomalacia, which appears in the first month of life and often resolves by 1 to 2 years of age. It may be associated with tracheomalacia, a partial collapse of tracheal cartilage with respiration. Vocal cord paralysis, the second most common cause of stridor in infants, is usually due to central nervous system lesions (eg, Arnold-Chiari malformation, raised intracranial pressure, other brainstem insults) or traction on the recurrent laryngeal nerve (often a birth complication). Other neonatal lesions include a small cricoid cartilage, acquired subglottic stenosis such as a complication of intubation, subglottic and laryngeal cysts or webs, tracheal rings, and subglottic hemangiomas.

Croup and its variants are the infectious causes of stridor. Croup (laryngotracheobronchitis) most commonly is caused by parainfluenza virus (types 1 and 3), influenza A virus, respiratory syncytial virus, and adenovirus in children younger than age 3. Croup results from subglottic inflammatory edema. Because the vocal cords are spared, the voice often is normal and the stridor is biphasic. There is a barking cough, but no drooling or difficulty swallowing is apparent. There is accumulating evidence that steroids administered by various routes, including inhalation, can decrease hospitalization rates, shorten the disease course, and reduce the incidence of intubation for airway support. An infrequent but not rare variant is recurrent or spasmodic croup. Still not well understood, this entity may represent some combination of allergic or structural abnormality.

Epiglottitis or supraglottitis presents as acute, rapidly progressive cellulitis of the epiglottis and hypopharynx, with inflammatory swelling and a risk of complete airway obstruction in children 2 to 6 years of age. The child drools, leans forward, hyperextends the neck, and has a sore throat and fever. Aggressive, prompt management of the airway is essential. Care must be taken to avoid increasing the child’s anxiety, procedures should be minimized, and the oral examination should be avoided. The differential diagnosis of croup and epiglottitis is crucial. The polysaccharide conjugated Haemophilus influenzae type b
vaccine has all but eradicated this life-threatening disorder in the United States.

Bacterial tracheitis, a superinfectious complication of airway alteration consequent to recent viral infection, most commonly is due to *Staphylococcus aureus*, but it also may be caused by *Moraxella catarrhalis*, *Streptococcus pneumoniae*, and nontypeable *H influenzae*.

Other upper airway obstructive infections that may not present with stridor include tonsillitis (especially infectious mononucleosis), retropharyngeal abscess, and peritonsillar abscess.

The presence of a foreign body always must be considered at the presentation of stridor and upper airway obstruction and must be reconsidered when symptoms do not resolve according to expectations. Some objects are not radio-opaque and, thus, present a challenge to radiologists. One consequence of the epidemic of human papillomavirus infection among sexually active youth and adults is that their offspring may acquire this virus during birth, leading in the first few years of life to recurrent respiratory papilloma in the larynx or elsewhere in the upper airway. Other considerations in the etiology of stridor include gastroesophageal reflux, corrosive ingestion, angioedema, and candidiasis. Like other common clinical syndromes, with stridor it is important to understand the horses while keeping the zebras in mind.

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