Airways Obstruction

Definition / Supporting Information

Airways obstruction may result from aspiration of a foreign object or intrinsic reduction in the inner diameter of the airway.

Acute airways obstruction can occur throughout the respiratory tract. In the infant and young child, the narrowest portion of the airways is the cricoid ring. In the older child and adolescent, the narrowest portion of the airways is the vocal cord aperture.

Keywords / also known as: choking, airway blockage, allergic reaction, airway trauma, swelling, inflammation

Essential History

Ask about:

- Onset of respiratory distress
  - Acute
  - Gradual
- Duration
- Factors that worsen or improve signs and symptoms
- Prenatal and birth history
  - Problems during pregnancy
    - Decreased foetal movement
    - Oligohydramnios
  - Gestational age at birth
  - Type of delivery
  - Abnormalities in presentation and difficulty in delivery
  - Resuscitation efforts required during birth, including need for intubation
- Evidence of infection
  - Fever
  - Immunisation status
- For suspected foreign body aspiration
  - Whether the event was witnessed
  - The type of object aspirated
  - The time the event occurred and how much time has elapsed
- Trauma involving the neck
- History of surgery involving the chest or neck
- Neurological conditions eg, Arnold–Chiari malformation

'Red Flag' Symptoms and Signs

Evaluation should progress only after the ABCs (airway, breathing, circulation, and cervical spine stabilisation) of resuscitation have been addressed.

Ask about:

- Possibility of foreign body aspiration
- History of choking
- Fever (see table of infectious causes)
- Known neurological conditions

In children beyond the newborn period – acquired infectious causes of airways obstruction (see Stridor):

Factor	**Epiglottitis**	**Viral Croup**	**Spasmodic Croup**	**Bacterial Tracheitis**
Age (yr)	**2–6**	**0.6–2**	**0.5–3**	**4–8**
Organism	*Haemophilus influenzae* type b	Parainfluenza 1, 2, 3	Not infective Associated with allergy/ Gastro-oesophageal reflux	*Staphylococcus aureus, Haemophilus influenzae* type b
Season	All year	Late spring, late autumn	All year	All year
Clinical Presentation	Child sitting Toxic Drooling Dysphagia Muffled voice	Child lying down Non-toxic Barking cough Hoarseness	Non-toxic Barking cough Hoarseness	Toxic Barking cough
Onset Prodrome	Rapid over a few hours	Variable; few hours to 4 days	Sudden	Variable; few hours to 5 days
Stridor	Less common	Common	Very common	Common
Fever	High	Low-grade	Afebrile	High
Chest Retractions	Less common	Common	Common	Common

Progression	Rapid	Usually slow	Rapid	Usually slow, occasionally rapid
Recurrence	Rare	Common	Very common	Rare

Look for:

- Signs that the child requires emergency intervention (see Recognition of airway obstruction [European Paediatric Life Support (EPLS) manual])
  - Reduced upper airways patency
    - Complete occlusion
    - Partial occlusion
    - Stridor
  - Evidence of respiratory distress (see Dyspnoea)
    - Tachypnoea
    - Recessions
    - Cyanosis
    - Hypoxia
  - Altered level of consciousness
    - Agitated
    - Lethargic / fatigued
    - Obtunded

Differential Diagnosis / Conditions

In early infancy:

- Laryngomalacia
  - Most common cause of stridor in an infant
    - Stridor is positional: severity is greater when the infant is supine, less when the infant is prone
  - Onset typically within the first 2 weeks of life
    - Worsens in the first few months and usually resolves by 2 years of age
- Vocal cord paralysis
  - May be congenital or acquired and unilateral or bilateral.
  - Often associated with birth trauma, difficult delivery, and mechanical ventilation, post surgery
  - May also result from:
    - Elevated intracranial pressure
    - Congenital Arnold–Chiari malformation
    - Intracranial mass

- Extrinsic compression of the trachea
  - Thyroglossal duct cyst
  - Ectopic thyroid tissue
  - Oesophageal duplication cyst
  - Lymphoma, haemangioma
  - Cardiac or vascular anomaly
- Craniofacial anomalies (see Congenital Malformations)
  - These put children at risk for chronic and severe obstruction of the upper airway.
- Tracheomalacia
  - Symptoms usually appear before 2 months of age
  - Chronic wheezing is present
    - May be misdiagnosed as asthma
- Retropharyngeal abscess, lateral pharyngeal space abscess, and sublingual space angina
  - Most common in children between the ages of 2 and 4 years
  - Presenting symptoms
    - Neck pain
    - Fever
    - Sore throat
    - Neck swelling
- Peritonsillar abscess
  - Most common deep neck infection in children and adolescents
  - Clinical presentation
    - Severe sore throat (often one-sided)
    - Fever
    - Muffled (‘plummy’) voice
    - Swelling of the neck accompanied by neck pain
    - Stertor
- Laryngeal papillomatosis
  - Infection of the airways by human papillomavirus
  - Most commonly acquired as the neonate passes through the birth canal
  - Diagnosed in children between 2 and 4 years of age
  - Clinical presentation
    - Hoarseness
    - Stridor
    - Respiratory distress in advanced cases (see Dyspnoea)
- Vascular anomalies, such as vascular ring
  - Structural anomalies can produce extrinsic compression of the airway, resulting in obstruction and respiratory distress.

  - With severe obstruction, infants may exhibit failure to thrive.

In children beyond the newborn period – acquired non-infectious causes of airways obstruction:

- Vocal cord dysfunction
  - Sudden onset of laboured breathing with inspiratory stridor
  - Often self-limiting
- Anaphylaxis
  - If oedema involves the tongue, pharynx, and larynx, the clinical presentation may be severe and life-threatening.
  - Onset of symptoms is usually sudden.
  - The patient may have urticaria and facial and / or lip oedema.
- Foreign body aspiration
  - Usually seen in children < 3 years, with peak incidence between 1 and 2 years of age
  - Commonly aspirated objects include:
    - Peanuts, nuts, and seeds
    - Food particles
    - Hardware**,** cotton wool, sponge
    - Coins / metal objects
    - Pieces of toys, such as balloons, small marbles, or beads
  - Trauma
    - Trauma to the neck
    - Exposure to hot smoke (eg, house fire)

Investigations

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team):

- Usually not appropriate as children require urgent / immediate referral for further assessment

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric Team(s)):

- C1 esterase measurement may be necessary in children with suspected angioneurotic oedema.
- Soft tissue lateral neck X-ray or other X-rays (eg, chest) may be required to diagnose:
  - Retropharyngeal abscess
  - Foreign bodies

Treatment Approach

Acute airways obstruction resulting in severe respiratory distress is a medical emergency and should be treated accordingly using the Advanced Paediatric Life Support (APLS) / EPLS guidelines.

In severe cases, the ENT team and anaesthetic team will need to be involved.

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Surgery / Paediatric Intensive Care Team(s)):

- Anaphylaxis
  - Treatment must be immediate.
  - Initial therapy is intramuscular injection of adrenaline.
  - After initial treatment, systemic corticosteroids and an antihistamine should be provided.
  - Consider referral to a Paediatric Allergy clinic
- Foreign body aspiration
  - In children with severe respiratory distress, the Ear, Nose and Throat (ENT) and Anaesthetic Teams should be involved to consider rigid bronchoscopic removal of the foreign body.
- Vocal cord paralysis / tracheomalacia
  - Refer to ENT Team or Paediatric Respiratory Team for further investigation
- Laryngotracheobronchitis (see Croup)
  - Most children have an uncomplicated course and are managed without formal medical care.
- Peritonsillar abscess and severe bacterial tonsillitis
  - Intravenous antibiotics
  - Referral to ENT Team for further management
- Bacterial tracheitis
  - Antibiotics and supportive care are essential.
  - Severe cases may require intubation and ventilation.
- Laryngeal papillomatosis
  - Referral to the ENT Team
  - Laser ablations may be required.
- Vocal cord dysfunction
  - Referral to the ENT Team for further assessment and management
  - Patient education, speech therapy, and biofeedback to teach patients to control vocal cord movement have produced favourable results.

When To Refer

Refer urgently (arrange emergency transfer) to specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Surgery / Paediatric Intensive Care Team(s)) if:

- Any 'red flag' signs or symptoms

Escalate care to specialist practitioners (eg, Paediatric ENT / PICU Team(s) with involvement of Anaesthetic Team) if:

- Severe respiratory distress due to any cause and especially if requiring supplemental oxygen (see Dyspnoea)
- Infant with upper airways obstruction who is having difficulty drinking and maintaining hydration
- Epiglottitis
- Retropharyngeal abscess
- Bacterial tracheitis
- Foreign body aspiration

'Safety Netting' Advice

If the obstruction is initially mild, respiratory infections may worsen the condition causing the need to consult again. Advise parents / carers to seek urgent medical advice if the symptoms worsen.

Patient / Carer Information

Please note: whilst these resources have been developed to a high standard they may not be applicable to children.

- How to help a choking child (Web page), the NHS website
- Epiglottitis (Web page), the NHS website
- Croup (Web page), the NHS website

Resources

National Clinical Guidance

Ear, nose and throat conditions overview (Web page), NICE pathway, National Institute for Health and Care Excellence.

Suggested Resources

Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.

Advanced Paediatric Life Support: The Practical Approach (APLS). 5th ed. John Wiley & Sons (Wiley-Blackwell); 2011.

European Paediatric Life Support (EPLS) for use in the UK. 3rd ed. Resuscitation Council; 2011.

Basic Child Assessment: How To (Web page), Spotting the Sick Child

Acknowledgements

Content Editor: Dr Doug Simkiss & Dr Tina Sajjanhar

Clinical Expert Reviewer: Mr Michael O'Connell

GP Reviewer: Dr Richard Pratt

AAP Reviewer: Jane Meschan Foy, MD, FAAP

Paediatric Trainee Reviewer: Dr Ahtzaz Hassan

Update information

Created: 2017

Date last updated: -

Next review due: 2020