

BACTERIAL TRACHEITIS

INTRODUCTION (MICHAEL MOJICA, M.D., 6/2017)

Bacterial tracheitis is a potentially life-threatening infection of the tracheal soft tissue with a mortality rate of 2-3%. Infection may extend superiorly to the subglottic area and inferiorly to the bronchi and lungs. Infection occurs due to 1. Airway mucosal damage as is seen in laryngeal tracheal bronchitis (viral croup), 2. From extension of an upper respiratory tract infection (e.g. pharyngitis, sinusitis) or a lower respiratory tract infection (e.g. pneumonia) or 3. Because of trauma from airway procedures or due to endotracheal or tracheostomy tubes. Staphylococcal aureus is the most common pathogen though infection may be poly-microbial. (See: [PEM Guide: Resuscitation: Airway](#)).

BACTERIOLOGY OF BACTERIAL TRACHEITIS

Staphylococcus aureus (#1)
Streptococcus pneumoniae
Group A streptococcus
Alpha hemolytic streptococcus
Moraxella catarrhalis
Haemophilus influenza non-typeable

CLINICAL MANIFESTATIONS

Bacterial tracheitis is most common in children less than 6 years of age and coincides with viral croup season. Presentation can be a 1. Slow progression of increasing symptoms over 2-3 days or 2. An acute presentation due to sudden complete airway obstruction by a pseudo-membrane.

Signs and symptoms are suggestive of upper airway obstruction and include: stridor, cough, respiratory distress, cyanosis and altered mental status. Diagnosis is made more difficult because symptoms are similar to croup and a benign course of croup can precede bacterial tracheitis. A rash can be seen with staphylococcal toxic shock syndrome (erythroderma) and streptococcal pharyngitis (scarlatiniform rash).

DIFFERENTIAL DIAGNOSIS OF AIRWAY OBSTRUCTION

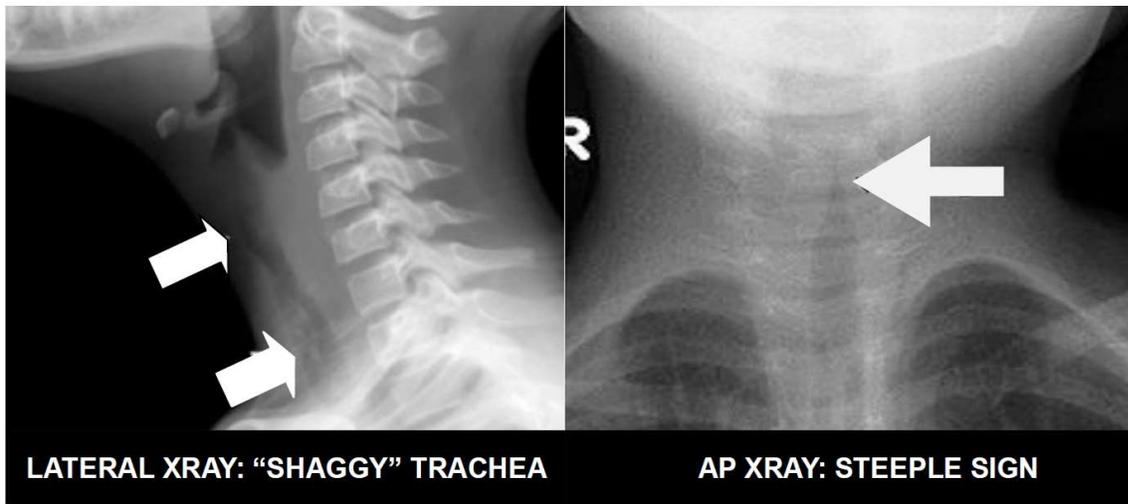
Epiglottitis	Droping, tripod position, lateral neck XRAY thumb sign
Croup*	Generally, less fever and less toxic appearing
Peritonsillar abscess*	Decreased neck range of motion, trismus, torticollis
Retropharyngeal abscess*	Decreased neck range of motion
Severe pneumonia*	Focal findings on lung exam
Foreign body aspiration*	Abrupt onset of symptoms, afebrile
Diphtheria	Oro-pharyngeal membrane on examination
Anaphylaxis*	Afebrile, hives, wheezing, angioedema, shock
Smoke inhalation*	Afebrile, history of smoke exposure, burns, co-oximetry

*Reviewed in detail in a separate PEM Guide

DIAGNOSTIC TESTING

The diagnosis is made clinically based on the severity of upper airway obstruction, the toxic appearance of the child and a lack of response to nebulized epinephrine. The diagnosis can also be confirmed by direct laryngoscopy but only in a setting (e.g. operating room) where definitive airway management can be performed.

A soft tissue lateral neck XRAY could be considered in a clinically stable patient. Findings include a “shaggy” trachea due to irregularity of the tracheal mucosa. A “steeple” sign representing subglottic narrowing can be visualize on the AP view but this does not distinguish between bacterial tracheitis and croup. Acute phase reactants (WBC, CRP) are typically elevated but are non-specific and do not contribute to clinical management. Blood cultures are rarely positive. If the patient is intubated specimen for culture should be sent from tracheal aspirates.



MANAGEMENT

Airway management is the priority in patients with bacterial tracheitis. Most patients with bacterial tracheitis require intubation. This should ideally take place in the operating room with all required personal and advanced airway equipment and a clear strategy for progression if early efforts are unsuccessful. Bronchoscopy should be available to clear airway debris. A complete airway occlusion can sometimes be temporarily cleared with bag-valve-mask ventilation.

ANTIBIOTIC SELECTION: Antibiotics should be targeted to the likely pathogens. Vancomycin is administered to cover both methicillin resistant and sensitive staphylococcus aureus as well as streptococcal species. Ceftriaxone is also administered to provide coverage for gram negative organisms such as Moraxella catarrhalis and non-typeable Haemophilus influenzae. In the patient with a history of a type 1 hypersensitivity reaction to penicillin, Meropenem or Levofloxacin can be substituted for Ceftriaxone. Clindamycin can be added to decreased toxin production in toxic shock syndrome.

ADDITIONAL THERAPIES: Fluid resuscitation should be provided for those with signs of shock and a maintenance fluids for those with dehydration. There is no evidence to suggest a benefit of corticosteroids.

DISPOSITION

Ultimately the patient requires admission to the PICU after the immediate airway compromise is addressed.