Epiglottitis

Epiglottitis is a life-threatening condition that is caused by bacterial infection of the epiglottis, aryepiglottis, and arytenoids. It is differentiated from viral croup and foreign body aspiration by the acutely ill appearance of its victims and its fulminant onset.

I. **Pathophysiology**

A. Epiglottitis is a pediatric emergency and it is the most dangerous cause of upper airway obstruction. It is a bacterial infection characterized by marked edema of the epiglottis, aryepiglottic folds, and arytenoid soft tissues. Generally, the process does not extend into the subglottic region.

B. Epiglottitis is now rare because of Haemophilus influenzae type B (Hib) conjugate vaccine administration.

C. Acute disease generally occurs in children between the ages of 2 and 6 years. More than 75% of cases are caused by H influenzae type b. Rarely, other bacterial causes include beta-hemolytic streptococci, staphylococci, and pneumococci. There is no seasonal incidence.

II. **Clinical Manifestations of Epiglottitis**

A. Epiglottitis in the child older than 2 years is distinguished easily by its severe, abrupt presentation. Respiratory problems become prominent within 12 hours of the first clinical manifestations. High fever (38.8-40.5°C) and sore throat are the earliest features, followed rapidly by the development of a muffled or absent voice, wet stridor, retractions, tachycardia, and tachypnea. Swallowing difficulties, characterized by dysphagia and excessive drooling, are also common.

B. The child appears quite toxic and is apprehensive, anxious, and pale.

C. The child will characteristically, assume the sitting up posture, leaning forward with neck extended, mouth open and jaw thrust forward--in an attempt to maximize airway diameter. Cough, a common feature of viral croup, is usually absent in epiglottitis.

D. Cyanosis, shock, prostration, loss of consciousness, and complete airway obstruction, will ensue if immediate intervention does not take place.

III. **Diagnostic Evaluation**

A. Patients with typical clinical features (rapid onset of illness, muffled voice, wet stridor, drooling, evidence of toxicity, and preference for sitting) should undergo immediate direct visualization of the epiglottis in the operating room to confirm the diagnosis and establish an artificial airway.

B. Blood gas measurements, cultures, radiographs, and blood cell counts are not required to establish the diagnosis in the critically ill, and agitating the child may precipitate complete airway obstruction.

C. **Direct Visualization**

1. Direct visualization of the epiglottis provides a rapid, accurate, and safe method of diagnosing epiglottitis. Have the child open his mouth, which may reveal the swollen, cherry-red epiglottitis at the base of the tongue. If this is unsuccessful, gentle depression of the tongue with a depressor may facilitate visualization of the epiglottis.
2. A curved laryngoscope can be used to gently examine the anterior two-thirds of the tongue, but the epiglottis should not be touched, and the patient's posture should not be disturbed.

D. **Neck radiographs**

1. Lateral neck radiographs should not be required to establish the diagnosis. In less severe cases of obstruction, the lateral neck radiograph is confirmatory. X-ray studies should be performed in the emergency room.

2. The thumb sign, which shows the rounded, thickened, edematous epiglottis of the shape and size of an adult's thumb, is classic for the diagnosis of epiglottitis.
3. Other findings seen on lateral neck films include a dilated hypopharynx and widened aryepiglottic folds.

IV. Management of Epiglottitis

A. Airway Management

1. The first priority is to secure the airway by immediate endotracheal intubation. The decision to intubate must be based on clinical grounds. Extreme agitation, obtundation, pronounced stridor with use of accessory muscles of breathing, and a compatible history are indications for intubation.
2. If the child is cyanotic, bradycardic or sustains respiratory arrest, the child should be intubated immediately.
3. If decompensation occurs before the patient can be intubated, positive-pressure ventilation, with a non-rebreathing 100% oxygen bag should be initiated as a temporary measure
4. If time permits and the child is stable, the child should be taken to the operating room where anesthesia can be given and the upper airway visualized directly.
5. The administration of topical 4% cocaine spray aids in intubation, and atropine, 0.01 mg/kg intravenously decreases the vagal response.
6. Cultures of the blood and epiglottis are obtained after the airway is stabilized in the operating room. Blood cultures are positive in 90% of cases; epiglottic swabs are positive in 33%.
7. All those who have a clinical diagnosis of epiglottitis are intubated.

B. Antibiotic Therapy

1. Second-and-third-generation cephalosporins, such as ceftriaxone, cefuroxime, or cefotaxime, are the antibiotics of choice for acute epiglottitis because of the high prevalence of ampicillin-resistant strains of Hib (1/3 of all Hib isolates).
   a. Ceftriaxone (50 mg/kg/d given once a day IV);
   b. Cefuroxime (100-150 mg/kg/d divided q8h IV);
   c. Cefotaxime (150 mg/kg/d divided q8h IV).
2. Cephalosporins should be avoided in patients with a history of an allergic reaction to penicillin because of the 10% cross hypersensitivity between penicillin and cephalosporins. Chloramphenicol (50-75 mg/kg/d divided q6h IV) is an appropriate alternative in penicillin allergic patients.

C. Steroids are not indicated for the management of epiglottitis. Similarly, racemic epinephrine has no role in the treatment of acute epiglottitis.

D. Once intubated, the child should be placed in an intensive care unit and mildly sedated with midazolam. Mechanical ventilation is not routinely indicated. Humidification can be maintained by blow-by mist and oxygen.

E. Intubation should be maintained for a minimum of 24 hours. Most patients will be extubated within 36 hours and the vast majority within 72 hours. The patient is extubated after the presence of a leak around the endotracheal tube is apparent. Direct laryngoscopy or indirect fiberoptic laryngoscopy is employed to confirm resolution of swelling in the supraglottic region.

F. Antibiotics are administered for 5 to 7 days. Parenteral therapy is discontinued after extubation and oral therapy is initiated. If there are household contacts younger than 4 years and H influenzae is the causative agent, a 4-day course of rifampin should be administered to family members or day-care providers and to the patient upon completion of the initial antibiotic course. Complete recovery is the rule; recurrences are rare. §