

# Nontraumatic pediatric emergencies

Harvey Teo and David Stringer

## Respiratory system

### Croup

Croup, or acute laryngotracheobronchitis, is the commonest cause of acute stridor in infants and young children under two years of age. The peak incidence is in the second year of life. The commonest organism is the parainfluenza virus, although other viruses are also known to cause the condition. Pathologically, subglottic tracheal narrowing occurs due to edema accumulating within the loose attachment of the mucosa in this region. The symptoms range from mild cough to severe life-threatening respiratory obstruction.

The diagnosis of croup is based on clinical findings, and there is no evidence that other investigations or radiographs are useful in the diagnosis of this condition. If radiographs are performed, the ap view may show an inverted V-shaped narrowing of the subglottic region which extends below the level of the lower margins of the pyriform sinuses and appears more marked in inspiration (Figure 5.1). This is also known as the “steeple-sign,” but this sign may be absent in up to 50% of cases and may be present in the absence of croup. The narrowing in the subglottic region is less pronounced on the lateral view than the ap view, as the narrowing occurs primarily laterally. Hypopharyngeal distension, indistinctness and thickening of the vocal cords may also be seen. The epiglottis is normal.

### Epiglottitis

Acute epiglottitis or membranous croup is a bacterial infection of the epiglottis and aryepiglottic folds. *Haemophilus influenzae* type B (Hib) is the commonest organism causing acute epiglottitis, but since the widespread implementation of a conjugate vaccine for Hib, the incidence of epiglottitis has significantly declined in children. Sporadic cases still occur due to vaccine failure. The age group of patients with acute epiglottitis is three to five years. The clinical onset and presence of systemic symptoms are more rapid and severe than croup. The clinical triad of drooling, dysphagia and distress is a classic presentation. A viral prodrome and cough are seldom observed with acute epiglottitis and are more often witnessed

in association with croup. Acute epiglottitis is a medical emergency, and imaging and other investigations should be postponed until the airway is secure. The lateral neck radiograph may show the epiglottis and aryepiglottic folds to be swollen and rounded (Figure 5.2). Hypopharyngeal distension may also be present. On the ap neck radiograph, there may be subglottic narrowing resembling croup. The poor sensitivity (38%) and specificity (78%) of plain films limits their utility, especially since the larynx can be safely and accurately visualized with flexible laryngoscopy in most modern institutions.

### The wheezing child

Wheezing is defined as a high-pitch, whistling sound occurring during the expiratory phase of respiration. It is caused by airway



**Figure 5.1** One-year-old boy with stridor. The frontal view of the neck shows steple-shaped narrowing of the subglottic region (arrow) suggestive of croup.