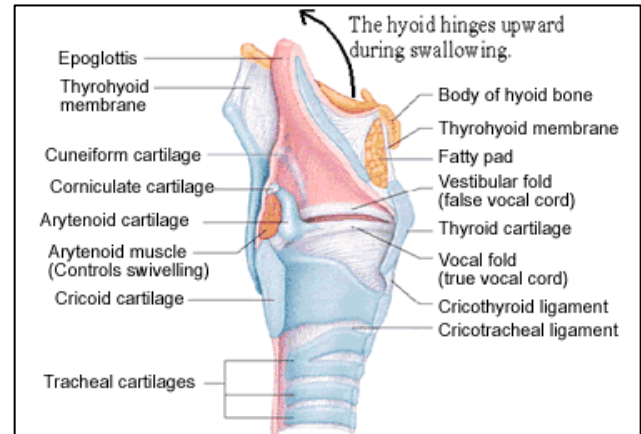


Laryngospasm

Anesthetic Pearls: Physiology and Treatment of Laryngospasm

Laryngospasm is defined as the approximation of true vocal cords or approximation of both the true and false vocal cords. It also involves soft tissue of the supraglottic region being drawn into the laryngeal inlet. The spasm can be prolonged due to continuous contraction of abdominal muscles, expiratory effort, and continued closure of the larynx. Laryngospasm is made worse as supraglottic tissue folds over the vocal cords. Incidence is approximately 9 / 1000 in total population and 17 / 1000 in the 0-9 years age group. Patients 1 - 3 months old have 3 times the incidence as compared to any other age group. Additionally, patients with laryngospasm have a 0.5% of developing cardiac arrest. Laryngospasm is most often produced by inadequate depth of anesthesia with sensory stimulation (secretions, manipulations of airway, surgical stimulation). Risk factors also include young age, extubation of the trachea, presence of NG tube or oral airway, endoscopy, URI's, and irritating volatile anesthetics (Isoflurane / Desflurane).

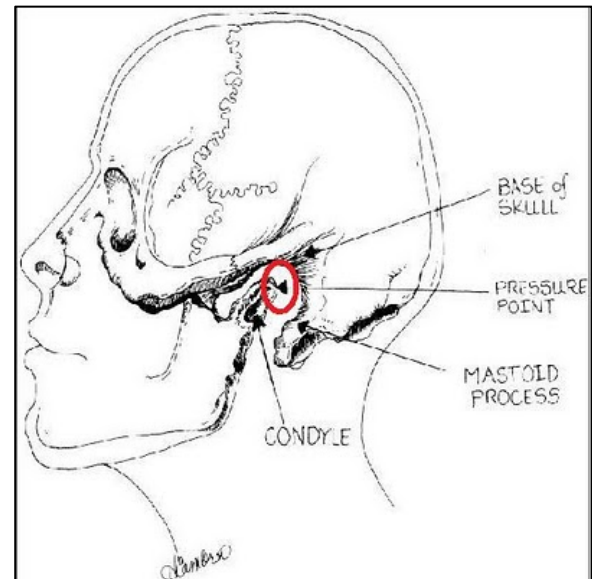


Treatment Options

Incomplete airway obstruction ("pseudo" laryngospasm) treatment includes removal of stimulus, 100% oxygen, continuous positive pressure by mask, extension of head with anterior displacement of the mandible (mastoid pressure with jaw-thrust), and deepening the anesthetic if it occurs at the beginning of the case.

Complete airway obstruction ("true" laryngospasm) occurs when positive pressure will not "break" the laryngospasm but may make it worse by forcing supraglottic tissues down into the glottis. Also it may fill the stomach with air which can further decrease oxygenation / ventilation. Only a paralytic will relieve the complete or true laryngospasm.

1. If an **IV** is present: Atropine 0.02 mg/kg + Succinylcholine 1.5 mg/kg.
2. If there is **no IV** access: Succinylcholine 4 mg/kg IM is recommended.
3. **If Succinylcholine is contraindicated:** Rocuronium 1 mg/kg IV (if **no IV** is present, may use Rocuronium 1.0 mg/kg IM for infants and 1.8 mg/kg for children)
4. IM drugs should be given in the deltoid muscle for most rapid onset.
5. If the child is extremely hypoxic and bradycardic, it may be necessary to intubate without muscle relaxant.
6. In extremis, an emergency tracheotomy or cricothyrotomy may be performed.



Prevention

1. Awake or deep extubation (stage 1 or 3) – not in between during stage 2
2. Lidocaine 1.5 mg/kg prior to extubation
3. Decrease secretions (vagolytic drugs)
4. Proper positioning of the larynx by stretching it open with jaw thrust after extubation