

ADULT EPIGLOTTITIS THREATENING AIRWAY: BACK TO BASICS AND C.A.S.H. TREATMENT

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Abstract

Infections involving the upper airway, especially epiglottitis (commonly caused by *Haemophilus influenzae*) have gained importance in the adult population in recent years, due to widespread vaccination against *H. influenzae* (HiB vaccine) in paediatric age group. Such infections may present with only fever, sore throat, voice change and odynophagia, or may have a more fulminant presentation including threatened airway and sepsis, requiring ICU admission and definitive airway placement. We present a case of an adult diabetic male, who presented to casualty with threatened airway caused by epiglottitis and pharyngitis. He was managed with videolaryngoscopy guided endotracheal intubation, antibiotics, and ICU admission. Supportive treatment with C.A.S.H. (CPAP, Adrenaline, Steroids and Heliox) needs to be stressed upon when dealing with most upper airway obstructive causes. We present a case of acute epiglottitis in an uncontrolled diabetic male patient, with obstructed airway, requiring endotracheal intubation and ICU care. Antibiotics and C.A.S.H. treatment led to a successful recovery.

Keywords: Airway Management, Epiglottitis, Endotracheal intubation, ENT, Intensive Care, Tracheostomy.

INTRODUCTION

Infections involving the upper airway present as a challenge in the ER (Emergency Room) and are an anaesthesiologist's nightmare due to the risk of airway obstruction. One such condition is epiglottitis, commonly caused by *Haemophilus influenzae*, which was earlier predominant in children. Due to the widespread use of *H. influenzae* vaccine (HiB) in children, this infection is becoming more common in adults.^{1,2} Adult epiglottitis remains a recognized cause of acute airway compromise with an associated mortality of 7-20%.³ We present a case of adult male with uncontrolled diabetes, who presented with acute epiglottitis threatening the airway. The patient's consent was sought for reporting his case in an anonymous fashion.

CASE SUMMARY

A 45-year-old male patient presented to the ER with throat pain, odynophagia, and hoarseness of voice for 2 days, now progressing to noisy breathing and choking sensation. An inspiratory stridor was audible. He was a known case of type 2 diabetes, non-compliant with treatment. The patient was made comfortable in a head elevated position and given oxygen, before performing a detailed examination. Otorhinolaryngology department (ENT) resident was summoned to assist with any airway related issues. The patient was conscious, oriented, febrile (temperature 100.5 deg F), tachycardic (heart rate 136 beats/min) and tachypnoeic (respiratory rate of 32/min), with an oxygen saturation of 93% on air. There was no facial/lip edema, rash, history of any allergies, insect bites or intake of any new food/medication. On intra-oral examination, the tongue and tonsils were normal in size and colour, but the uvula appeared angry-red and edematous.

A working diagnosis of pharyngitis/laryngitis with airway edema was made and it was decided to start antibiotics (ceftriaxone) and steroids (dexamethasone) along with nebulization with racemic mixture of adrenaline. Blood sugar at this point was 389 mg/dl and urine ketones were negative. Relevant blood samples including complete blood count, kidney and liver function tests, electrolytes, serum procalcitonin, HbA1C and blood cultures were sent. A decision was made to perform an awake video-laryngoscopy to ascertain the cause of stridor. The patient was nebulized with lignocaine and a 10% lignocaine spray was used to anaesthetize the posterior pharyngeal wall. In the supine position, awake video laryngoscopy was performed which showed inflamed and edematous uvula, posterior pharyngeal wall, and epiglottis, suggestive of pharyngitis with epiglottitis. With worsening stridor and respiratory distress, CPAP (Continuous Positive Airway Pressure) therapy with face mask was tried but was unsuccessful. As Heliox was not available in the hospital, it was decided to intubate the trachea for preventing further airway compromise. Emergency drugs and difficult airway equipment were kept at bedside. ENT doctor was on standby for emergency surgical airway. Rapid sequence induction was performed with fentanyl, thiopentone and succinylcholine. Intubation was possible with the help of a video laryngoscope, bougie and an endotracheal tube of #8.0 mm ID (Figure 1). The patient was then shifted to Intensive Care Unit (ICU) for further management. In ICU, the patient was nursed in a head-up position and treated with ceftriaxone, dexamethasone, and adrenaline nebulization, apart from standard ICU care. The patient was awake and responsive and maintained on T-piece/pressure support ventilation intermittently. Nutrition was started enterally and blood sugar was maintained with insulin infusion. Blood cultures did not reveal any growth, but the procalcitonin level was 5.5 with a white cell count of 20500/cumm. HbA1C level was 13.5%. After 3 days, when fever episodes subsided, a check video laryngoscopy was performed (figure 2) under mild sedation.

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Figure 1. Angry red, inflamed, and edematous epiglottis observed during video-laryngoscopy in ER



Figure 2. Video-laryngoscopy done in ICU after 3 days of pharmacological treatment showing resolving epiglottitis

The airway edema and inflammation were markedly reduced. It was decided to extubate the trachea, keeping video-laryngoscope and fiberoptic bronchoscope on standby. Post-extubation, the patient was given oxygen and intently monitored for features of airway compromise. He, however, maintained a patent airway, but hoarseness of voice persisted, with mild throat pain. The patient was monitored in ICU for 2 more days with antibiotics, steroids and adrenaline nebulization, and then shifted to ENT ward, with advice to follow up with endocrinologist for management of diabetes.

DISCUSSION

Acute epiglottitis or supraglottitis is a potentially life-threatening condition involving inflammation and oedema of the epiglottis and/or adjacent supraglottic structures.⁴ This is a true airway emergency as it endangers the airway within hours, leading to catastrophic outcomes.

Etiology

Adult epiglottitis may be caused by multiple factors, both infectious and non-infectious. Infectious causes can be bacterial, viral, or fungal in origin. Approximately 17% of adult epiglottitis are caused by *Haemophilus influenzae* type b. Alternatively, epiglottitis may be due to ingestion of caustic material, inhalational and thermal injuries.⁵

Epidemiology

With widespread vaccination against *H. influenzae* serotype b (Hib vaccine) worldwide, there has been shift in the incidence of acute epiglottitis from paediatric to adult population. The incidence of this infection in adult is around 1-4 cases/100,000 per year with a high mortality rate of 7-

20%. Population at risk are middle-aged whitemen, BMI > 25, chronic smokers and associated comorbidities like diabetes.⁶ However, a large subset of patients has no contributing risk factors.

Clinical presentation

This infection has a variable clinical presentation, ranging from fever, sore throat, odynophagia, and voice change to florid stridor and breathing difficulty with choking sensation. Diagnosis is often clinical, but patients may require nasopharyngoscopy with direct visualization of an inflamed epiglottis for confirmation and assessment of severity.⁷ Radiological investigations like Computed Tomography (CT) of the neck may provide an acceptable alternative, although direct visualization remains the gold standard. Stability of the patient in supine position must be confirmed before CT scan.⁸

Management

Treatment of adult epiglottitis, like that in paediatric population, revolves around airway management and is tailored to the degree of airway obstruction. Some patients improve with conservative medical management and others require emergency artificial airway placement. Vigilant clinical monitoring and identifying patients at risk of airway loss is a crucial step in the management of acute epiglottitis. A retrospective review done in 2010 revealed that 13.2% patients diagnosed with epiglottitis required intubation and 3.6% needed tracheostomy.⁹ While literature has traditionally supported surgical tracheostomy without any attempt at intubation, this recommendation has been replaced with awake fiberoptic guided intubation over the past 20 years.¹⁰ Presentation with signs of respiratory distress and stridor are considered strong predictors for airway intervention.¹¹ The others risk factors that could require airway management include rapid onset of symptoms (less than 24 hours), old age, male sex, and uncontrolled diabetes. A team approach in the ER with the emergency physician, anaesthesiologist and ENT department is crucial for management of impending airway obstruction.¹² This is followed by good supportive care with vigilant observation of resolution of airway oedema in the ICU. A multi-disciplinary care pathway is the cornerstone for management of the most patients of severe adult epiglottitis. Medical management primarily involves intravenous antibiotics. Third generation cephalosporin are often recommended as first line therapy.¹³ Supportive therapies that are useful include – application of CPAP to open the airway and Heliox inhalation to reduce upper airway turbulence.¹⁴ Steroids are used as powerful adjuncts to reduce airway oedema. Use of racemic adrenaline nebulization may be considered in patient with impending airway obstruction. Caution to be exercised while using adrenaline nebulization in elderly patients with history of cardiac diseases.¹⁵ An easy mnemonic to help with management of upper airway obstruction is C.A.S.H. (CPAP, Adrenaline nebulization, Steroids and Heliox).

Conclusion

By the medium of our case report, we wish to stress upon the importance of early and aggressive airway management plan in patients presenting with upper airway obstruction. Coordinated involvement of multi-disciplinary senior physicians from

Emergency Medicine, ENT, Anaesthesia and Intensive Care is the key in management of airway infections presenting with stridor. Antibiotics and ICU care are paramount for a favourable outcome. The importance of C.A.S.H. treatment cannot be ignored in such cases. CPAP therapy, adrenaline nebulization, use of steroids and rescue therapy with heliox when all else fails needs to be inculcated in all physicians dealing with airway situations.

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