



Death After Delayed Diagnosis of Acute Epiglottitis in an Adult Patient Initially Seen in Urgent Care: A Case Report

Urgent Message: Epiglottitis is a potentially fatal condition that has undergone a changing etiology in the post-Hib vaccine landscape. Urgent care providers should be well versed on its presentation to properly triage patients and avoid misdiagnosis.

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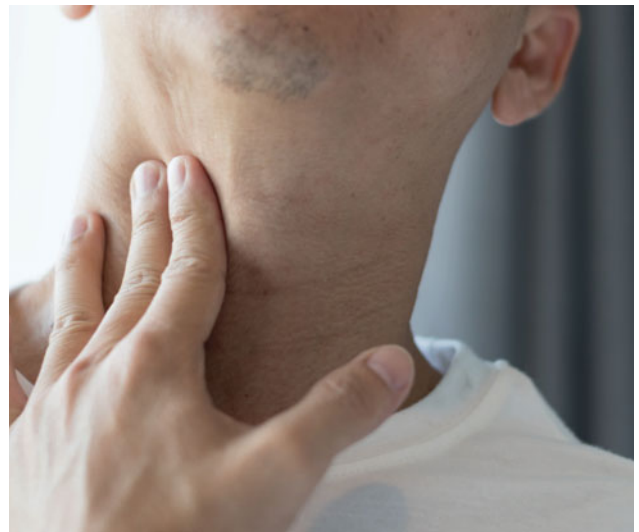
Key words: sore throat, epiglottitis, thumbprint sign
Abstract

Introduction: Acute epiglottitis is a potentially fatal condition which can progress rapidly to result in occlusion of the upper airway. Incidence of epiglottitis has decreased and shifted from children to adults after the widespread adoption of *Haemophilus influenzae* type B (Hib) vaccine. Early symptoms of epiglottitis may mimic more benign diagnoses, such as pharyngitis, which are much more commonly seen in urgent care (UC) settings.

Case Presentation: A 44-year-old man presented to a UC center with 2 days of worsening sore throat and painful swallowing.

Physical Exam: Physical exam findings revealed erythematous tonsils and posterior erythema of the oropharynx.

Case Resolution: The patient was diagnosed with acute nasopharyngitis at the initial UC visit and discharged



home. The next day, the patient had a sudden cardiac arrest while en route to the local emergency department (ED); he was not able to be resuscitated. Post-mortem examination revealed airway occlusion and respiratory failure secondary to acute bacterial epiglottitis.

Conclusion: While the incidence of acute epiglottitis has declined and shifted to a disease more commonly seen among adults over recent decades, it remains an important consideration for patients with sore throat.

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Affected patients are at risk for rapidly progressive swelling, which can result in fatal airway occlusion.

Introduction

Acute epiglottitis is a potentially fatal condition caused by a bacterial or viral infection, which can result in significant airway obstruction. Before the introduction of the *Haemophilus influenzae* vaccine in 1985, acute epiglottitis was largely considered a disease of childhood.^{1,2} However, since the widespread implementation of the *Haemophilus influenzae* type B (Hib) vaccine, the incidence of pediatric epiglottitis has decreased dramatically.² A 15 year retrospective Danish study found that within 2 years of the Hib vaccine's introduction into the standard pediatric immunization regimen, cases of acute epiglottitis had reduced by 72%.³ Today the *Streptococcus* species is the principal causative agent with the *Staphylococcus* species in the second position.⁴ Adults are at greater risk of fatal cases of epiglottitis with 63.5% of epiglottitis deaths occurring in those over age 18.⁵

Epiglottitis occurs when exudate from inflammation in the lingual tonsils spreads to the lingual surface of the epiglottis, triggering the swelling that is characteristic of acute epiglottitis.⁶ Rich networks of blood and lymphatic vessels on the lingual surface of the epiglottis cause this area to be particularly susceptible to inflammation.⁶

Accurate and timely identification remains the best route to epiglottitis diagnosis and management.

Case Presentation

A 44-year-old man with a history of hypertension and current tobacco use presented to urgent care with 2 days of worsening sore throat and painful swallowing. He also reported fever, nasal congestion, and post-nasal drip. He denied rash, nausea, cough, chills, pain in and around ear, and eye discharge or redness. His vaccination history, particularly regarding receipt of Hib vaccine, was not known. Additionally, his travel history was unknown.

Physical Exam Findings

The patient's vital signs were: blood pressure of 164/99 mm/Hg; heart rate of 109 beats per minute; respiratory rate of 16 breaths per minute; temperature of 37.5°C (99.6°F); and oxygen saturation of 93% on room air. The patient was noted by the UC clinician to be drooling and having difficulty speaking. He seemed to be in some distress secondary to painful swallowing and speech. Later deposition by the patient's wife revealed

that he was unable to lie down supine without distress. Neck/thyroid inspection was unremarkable.

Visualized portions of the oropharynx revealed erythema of the tonsils without exudate. Examination of the neck revealed anterior cervical lymphadenopathy. His lungs were clear with equal breath sounds, and he was tachycardic with a regular rhythm.

Urgent Care Management

The UC clinician obtained a rapid group A streptococcal (GAS) test, which was negative. The patient was given a presumptive diagnosis of acute nasopharyngitis and was prescribed an oral prednisone burst and azithromycin for the significant odynophagia he was experiencing. The patient was advised to see his primary care provider if his symptoms did not improve after 1 week. If symptoms worsened, the patient was advised to go to the ED or return to urgent care.

Case Continuation and Conclusion

The day after his UC visit, the patient's throat pain continued to worsen. He felt increasingly unwell, and he was taken to the ED by his wife. Unfortunately, the patient collapsed in the parking lot before entering the hospital. The patient was found to be in cardiac arrest when hospital staff responded. Cardiopulmonary resuscitation was initiated. In the ED, the emergency physician attempting intubation documented an enlarged and erythematous epiglottis seen on video laryngoscopy.

Despite all efforts to resuscitate the patient, he did not survive the event. An autopsy was performed with the medical examiner noting a bacterial infection of the entire supraglottic larynx, including severe purulence of the epiglottis with an aryepiglottic abscess. The cause of the patient's death was deemed to be a result of acute hypoxemic respiratory failure due to airway obstruction from acute bacterial epiglottitis.

Discussion

Although the incidence of epiglottitis has been declining since the advent of the Hib vaccine, the condition still occurs. A retrospective analysis of United States mortality trends related to acute epiglottitis since the introduction of the Hib vaccine revealed that the number of attributable deaths in adults has fallen from 65 in 1979 to 15 in 2017.⁵ During this study period, males were affected more frequently, accounting for 69.1% and 64.1% of the fatal cases in adults and adolescents respectively.⁵ Males between 42 and 48 years are the most frequently affected group.²

While cases may vary based on disease severity and

duration of illness, patients will commonly have multiple characteristic symptoms. Taken from a 2010 and 2021 retrospective review of 3 tertiary medical centers, the signs and symptoms of epiglottitis are reported in **Table 1**.^{7,8}

Tripoding (ie, assuming a leaning forward position to relieve pain and airway obstruction) is rarely observed in modern cases of adults with epiglottitis, however, it is a highly concerning finding if observed.⁹ Some patients with acute epiglottitis may lack posterior pharyngeal erythema and have a relatively normal appearing throat. In such cases where odynophagia is noted to be out of proportion to oropharyngeal visual inspection findings, the presence of tenderness with palpation/manipulation of the larynx at the hyoid bone is a finding which should raise concern for epiglottitis.¹⁰

When a diagnosis of bacterial epiglottitis is made, immediate parenteral antibiotic therapy is indicated. Third-generation cephalosporins or extended spectrum penicillin, as well as vancomycin for methicillin-resistant *Staphylococcus aureus* (MRSA) should be administered.⁴ Levofloxacin can be substituted for those with penicillin allergies. For cases with suspected *Pseudomonas aeruginosa* infection, cefepime or piperacillin-tazobactam can be used.⁴

One retrospective study found that patients treated with corticosteroids had a significantly decreased intensive care unit stay (1.7 days compared to 4 days, $p=0.0153$).⁷ However, a small sample size ($n=27$ and $n=11$) draws into question the validity of these results.

A rapid GAS test was performed at the initial UC visit in the case presented. Despite the negative result, the patient was placed on oral azithromycin and prednisone, which would not be indicated with the presumptive diagnosis given at the initial visit. Furthermore, the patient's decompensation despite oral antibiotics and corticosteroids underscores the importance of timely recognition of epiglottitis. Clues to a more serious diagnosis than a simple nasopharyngitis that were not further pursued by the UC clinician include the severity of the patient's pain, difficulty speaking, and difficulty swallowing secretions/drooling. Additionally, the patient may have not been immunized with the Hib vaccine, which may have also contributed to his risk. However, no pathogen was isolated given his precipitous deterioration and demise. While patients who did not receive the complete Hib immunization series may be at increased risk of epiglottitis, adequate vaccination does not exclude the possibility of epiglottitis, especially in adults.¹¹

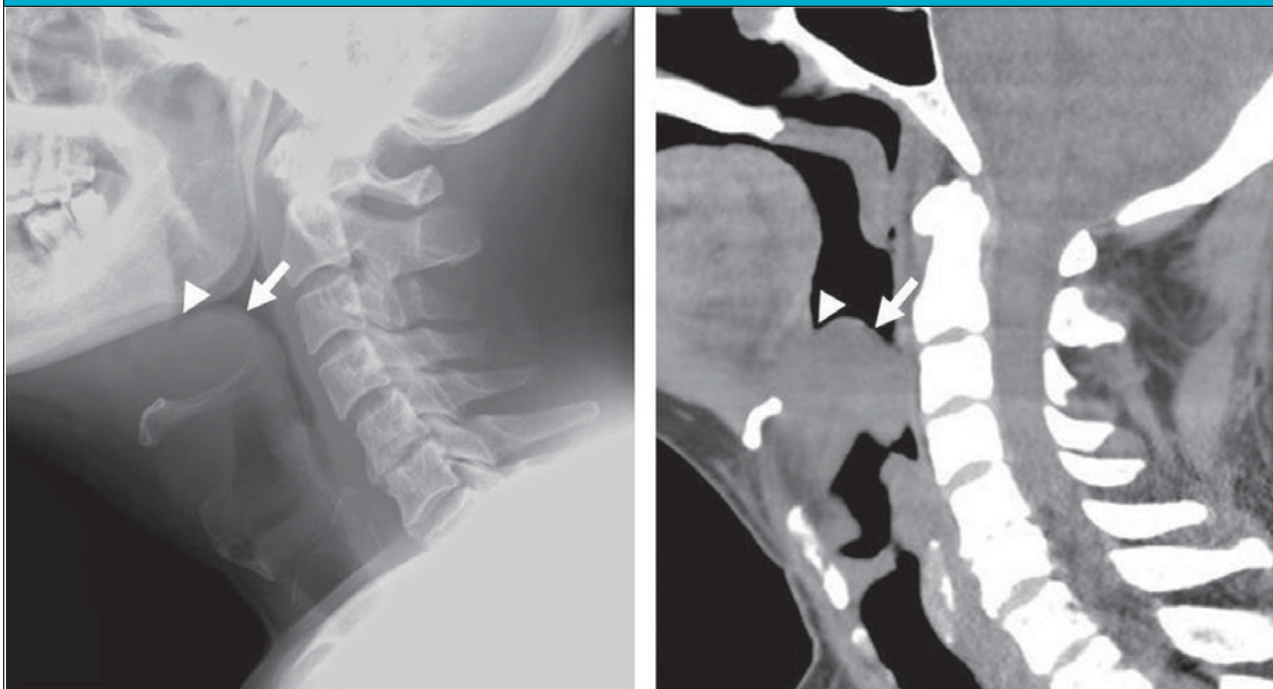
Early signs and symptoms of acute epiglottitis overlap

Table 1. Epiglottitis Symptoms and Signs^{7,8}

Symptoms and Signs	Percentage
Dysphagia	47.1% - 85%
Odynophagia	45.7% - 100%
Voice Changes	38.6% - 75%
Drooling	17.1% - 39%
Fever During Hospitalization	15.9%
Stridor	13% - 13.1%
Fever on Presentation	12.9%
Trismus Noted	5% - 9.1%
Tripod Position	5%

with those of many common self-limited conditions frequently seen in UC. However, because early recognition of epiglottitis is critical for preventing poor outcomes, as the patient in this case experienced, concerning findings during the initial assessment must not be overlooked. At the patient's initial presentation, there were several clinical clues to the presence of a more serious diagnosis than simple viral pharyngitis. The UC clinician noted that the patient had voice changes and drooling, which are atypical for viral pharyngitis and more suggestive of etiologies that can progress to airway compromise such as peritonsillar abscess, retropharyngeal abscess, and epiglottitis.¹²

The gold standard for diagnosis of acute epiglottitis is visualization of an inflamed and enlarged epiglottis on direct or video laryngoscopy.^{4,8} A presumptive diagnosis, however, is often arrived upon prior to laryngoscopy based on a combination of clinical and/or imaging findings. Lateral neck radiography can demonstrate enlargement of the epiglottis seen as the distinctive "thumbprint sign" (**Figure 1**).⁷ While highly suggestive of the diagnosis, 1 retrospective study found that the "thumbprint sign" is not seen in approximately 23% of presentations¹³; the subjective nature of this finding and its frequent absence early in the disease course functionally limit its clinical utility. Given the "can't miss" nature of epiglottitis, finding a more quantitative and sensitive radiographic indicator is important. Computed tomography (CT) of the neck with contrast has nearly 100% sensitivity for the diagnosis of epiglottitis¹⁴ but is rarely immediately available in UC settings. In a 2018 study, Kim et al. suggested radiographic criteria to enhance the sensitivity of plain x-ray (XR) in the diagnosis of epiglottitis. These authors explored test characteristics for the measurements of the widths of the epiglottic base, epiglottic tip, aryepiglottic fold, and hypo-

Figure 1. Lateral Neck Radiograph Showing Characteristic 'Thumbprint Sign' Suggestive of Epiglottitis

pharynx with the dimensions of the retropharyngeal and retro-tracheal tissues.¹⁵ Measurements of the epiglottic width at the base was found to have the best characteristics with a sensitivity of 96.2% and specificity 98.2% with a threshold of 5.02mm.¹⁵ However, it is important to note that this criterion was retrospectively derived and has not been prospectively validated.

In cases of suspected or confirmed acute epiglottitis, ensuring airway patency is the top priority, often by means of endotracheal intubation. In a meta-analysis of airway management outcomes in over 10,000 adult epiglottitis cases between 1980 and 2020, the overall rate of endotracheal intubation was 10.2%.¹⁶ Additionally, between 2-3% of cases were found to require surgical airway management in a large, retrospective Chinese study.¹⁷ History of diabetes and stridor have been shown to be predictive factors for an increased risk for requiring airway intervention.¹⁸

Given that invasive airway management maneuvers are not feasible in the UC setting, patients with signs or symptoms strongly suggestive of acute epiglottitis should be immediately transferred to an ED by emergency medical services (EMS). Radiography in UC should not be ordered as it unnecessarily delays EMS activation and transfer to a facility capable of advanced airway interventions. Deep tongue blade exam or other instrumentation of the posterior oropharynx should be avoided in

such cases as it may hasten airway compromise.⁴

In cases where clinical suspicion is present but low, it is generally appropriate to obtain soft tissue neck radiographs in UC. If there are suggestive findings of epiglottitis on lateral neck XR (eg, “thumbprint sign” or widening of the base of the epiglottis) and/or progression of symptoms during the patients UC course, EMS activation is indicated.

Ethics Statement

Patient was unable to be contacted due to the outcome of the case, therefore certain demographics and details of the case have been changed to protect patient anonymity and confidentiality.

Key Takeaway Points for Urgent Care Clinicians

- In the post-Hib vaccine era, acute epiglottitis is more commonly a disease of adults.
- Patients with acute epiglottitis may have a relatively normal appearing posterior oropharynx. Assessing for tenderness of the larynx at the hyoid bone can offer additional clues to the likelihood of epiglottitis in such cases.
- Voice changes, stridor, trismus, tripodding, and drooling are concerning signs for cases of throat pain, which have higher risk for airway compromise.
- Acute epiglottitis can progress rapidly and result in

airway occlusion, making early recognition and ED referral from UC critical for mitigating the risk of catastrophic outcomes.

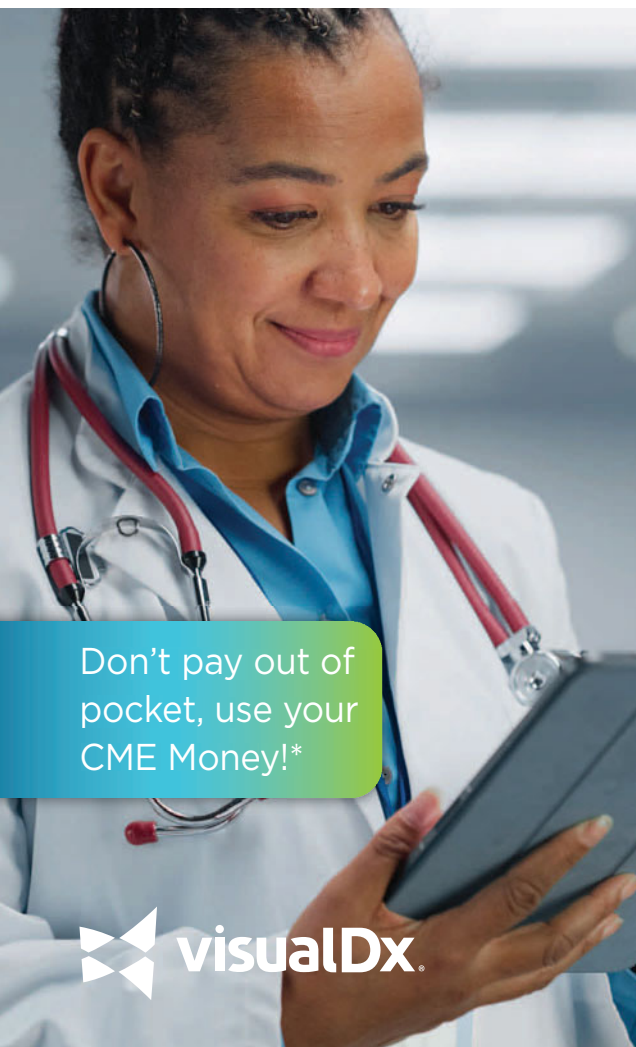
- EMS activation in cases of moderate-high suspicion for epiglottitis should not be delayed for the purposes of obtaining neck XR imaging from UC. ■

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