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CASE REPORT

Adult Epiglottitis as an Often Overlooked, Life-threatening Condition Requiring Special Airway Consideration; a Case Report

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Abstract: After the implementation of vaccination against Haemophilus Influenza Type B (Hib), adult patients comprise the majority of patients with acute epiglottitis. Its presentation with stridor mandates swift recognition and intervention to prevent airway compromise and mortality.

Here, we present a case of a 44-year-old male with diabetes mellitus who presented with acute onset of shortness of breath and stridor following days of throat soreness and fever. Initial treatment for suspected anaphylaxis provided partial relief, and emergency department evaluation revealed characteristic signs of acute epiglottitis on lateral soft tissue neck x-ray and nasopharyngoscopy. Treatment was initiated with intravenous ampicillin/sulbactam and dexamethasone, and the patient was discharged home on day 4. This case underscores the critical importance of maintaining a high index of suspicion for acute epiglottitis in adults presenting with stridor and respiratory distress. Prompt recognition, airway management, and appropriate antibiotic therapy are paramount in mitigating the potentially devastating outcomes associated with this condition. As demographics shift and vaccination impacts epidemiology, heightened vigilance in emergency settings is essential to improve outcomes in adult patients with acute epiglottitis.

Keywords: Epiglottitis; Haemophilus vaccines; Respiratory sounds; Airway management; Haemophilus influenzae type b

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1. Case Presentation

A 44-year-old male with a history of diabetes mellitus (noncompliant with taking Metformin 500 mg/BID) and a history of smoking for 0.5 packs/day presented to the emergency room complaining of acute shortness of breath and stridor. His symptoms had begun suddenly on the morning of presentation following several days of increasing throat soreness. He reported a self-measured fever of 39.4 degrees Celsius (103°F) the previous night and had taken his wife's Amoxicillin to alleviate his symptoms. Due to concern for an acute anaphylactic reaction, the patient was administered epinephrine, methylprednisolone, and diphenhydramine by emergency medical technician (EMT) prior to arrival at the emergency department (ED), resulting in some improvement in his clinical condition. Upon arrival, the patient's vital signs were as follows: blood pressure of 121/68 mmHg, heart rate of 121 beats/minute, respiratory rate of 32/minute, body temperature of 36.4 degrees Celsius (97.5°F), and oxygen saturation of 95% on room air. He had recently immigrated from eastern Europe and was never vaccinated against Haemophilus influenzae type b (Hib). In the ED, the patient appeared uncomfortable, exhibited drooling, increased work of breathing, and leaned forward persistently. Physical examination revealed audible stridor upon auscultation and erythema in the posterior oropharynx without evidence of exudates or uvula involvement. The patient was subsequently placed on bi-level positive airway pressure (BiPAP) and nebulized with racemic epinephrine, leading to some improvement in his symptoms. A lateral soft tissue neck x-ray was performed, due to high clinical suspicions of epiglottis pathology since he exhibited forward leaning to breathe and oral secretions. The lateral neck x-ray revealed the "thumb sing" and the "vallecula sign," suggesting a diagnosis of acute epiglottitis (Figure 1A). His chest x-ray showed no evidence of intrapulmonary congestion or disease (Figure 1B), and his electrocardiogram (ECG) revealed sinus tachycardia without any ischemic changes (Figure 2). An Ear, Nose, Throat (ENT) consult was requested, and a bedside flexible nasopharyngoscopy confirmed the diagnosis of acute epiglottitis, revealing an enlarged epiglottis, and edematous arytenoids and supraglottic space. Consequently, the patient was promptly transferred to the critical care unit for continuous intravenous ampicillin/sulbactam, dexamethasone, and close airway monitoring. The patient's Pro B-type natriuretic peptide level was 72 pg/mL, effectively ruling out congestive heart failure. His white blood cell count was $21\times10^3/\neq$ l, with 83% neutrophil predominance and an absolute neutrophil count of $17\times10^3/\neq$ l. Subsequent nasopharyngoscopy on day 2 ex-

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hibited significant improvement in epiglottic edema, leading to the patient's discharge home on hospital day 4 without any complications.A 44-year-old male with a history of diabetes mellitus (non-compliant with taking Metformin 500 mg/BID) and a history of smoking for 0.5 packs/day presented to the emergency room complaining of acute shortness of breath and stridor. His symptoms had begun suddenly on the morning of presentation following several days of increasing throat soreness. He reported a self-measured fever of 39.4 degrees Celsius (103°F) the previous night and had taken his wife's Amoxicillin to alleviate his symptoms. Due to concern for an acute anaphylactic reaction, the patient was administered epinephrine, methylprednisolone, and diphenhydramine by emergency medical technician (EMT) prior to arrival at the emergency department (ED), resulting in some improvement in his clinical condition. Upon arrival, the patient's vital signs were as follows: blood pressure of 121/68 mmHg, heart rate of 121 beats/minute, respiratory rate of 32/minute, body temperature of 36.4 degrees Celsius (97.5°F), and oxygen saturation of 95% on room air. He had recently immigrated from eastern Europe and was never vaccinated against Haemophilus influenzae type b (Hib). In the ED, the patient appeared uncomfortable, exhibited drooling, increased work of breathing, and leaned forward persistently. Physical examination revealed audible stridor upon auscultation and erythema in the posterior oropharynx without evidence of exudates or uvula involvement. The patient was subsequently placed on bi-level positive airway pressure (BiPAP) and nebulized with racemic epinephrine, leading to some improvement in his symptoms. A lateral soft tissue neck x-ray was performed, due to high clinical suspicions of epiglottis pathology since he exhibited forward leaning to breathe and oral secretions. The lateral neck x-ray revealed the "thumb sing" and the "vallecula sign," suggesting a diagnosis of acute epiglottitis (Figure 1A). His chest x-ray showed no evidence of intrapulmonary congestion or disease (Figure 1B), and his electrocardiogram (ECG) revealed sinus tachycardia without any ischemic changes (Figure 2). An Ear, Nose, Throat (ENT) consult was requested, and a bedside flexible nasopharyngoscopy confirmed the diagnosis of acute epiglottitis, revealing an enlarged epiglottis, and edematous arytenoids and supraglottic space. Consequently, the patient was promptly transferred to the critical care unit for continuous intravenous ampicillin/sulbactam, dexamethasone, and close airway monitoring. The patient's Pro B-type natriuretic peptide level was 72 pg/mL, effectively ruling out congestive heart failure. His white blood cell count was $21\times10^3/\neq$ l, with 83% neutrophil predominance and an absolute neutrophil count of $17\times10^3/\neq$l. Subsequent nasopharyngoscopy on day 2 exhibited significant improvement in epiglottic edema, leading to the patient's discharge home on hospital day 4 without any complications.

2. Discussion

Acute epiglottitis is an inflammation of the epiglottis and surrounding airway most often due to bacterial infections. Other etiologies include foreign body, chemotherapy, or chemical burns (1). In regions of the world where the Haemophilus Influenza Type B (Hib) vaccine has been successfully implemented, adult cases now make up the majority of acute epiglottitis occurrences (2). Patients at increased risk include middle-aged white males, smokers, or those who have other comorbidities, such as diabetes mellitus (3). It can cause acute airway compromise and is considered a life-threatening condition, often requiring intensive care unit (ICU)-level care. After the introduction of the Hib vaccine, the incidence in the pediatric population dropped from 4.9 to 0.02/100,000 (4).

In this case report, we described a situation in which epiglottitis was incidentally discovered on imaging in an adult patient with an unknown etiology of acute respiratory distress. Nationwide, there is minimal utilization of laryngoscope or computed tomography (CT)/X-ray imaging in adult epiglottitis patients and fewer clinical interventions are occurring in the ED compared to the inpatient settings (5). This points towards a lack of clinical recognition of adult epiglottitis occurring on a national level, which coincides with a decrease in the incidence of epiglottitis in the more traditional pediatric population. In our case, the patient was successfully stabilized and then identified as an epiglottitis patient upon further imaging.

3. Treatment & management

Acute management of adult epiglottitis is primarily centered on airway management and initiation of antibiotics along with adjuncts as indicated.

Management can range from clinical observation with antibiotics when stable to emergent and elective intubation (1, 3). While stridor is common in children, the presentation of stridor in an adult is more suggestive of impending airway obstruction and warrants stronger consideration for intubation (1). Antibiotics should always be administered in the undifferentiated patient given the most common cause of epiglottitis is due to bacterial infection (1, 6).

The most commonly encountered bacterial organisms are Hib, Streptococcus pneumonia, Group A Streptococcus, and Staphylococcus aureus including methicillin-resistant S. aureus strains (6, 7). Antibiotic coverage should be aimed at these organisms using empiric combination therapy with a third-generation cephalosporin such as ceftriaxone and an antistaphylococcal agent (7). Vancomycin is the agent of choice against staphylococcus species in patients with epiglottitis complicated by sepsis, concomitant meningitis, or those from areas with an increased prevalence of clindamycin-resistant methicillin-resistant S. aureus. Patients with a penicillin allergy should be treated with vancomycin and a fluoroquinolone antibiotic agent (8, 9).

Corticosteroid use in epiglottitis is relatively controversial as there is a paucity of data on its efficacy or clear benefit due to the rarity of the disease, especially in the adult population. Despite this, it is very often given, especially in deteriorating patients. Approximately 87% of patients received at least 1 dose of corticosteroids during their stay and data suggests a decrease in ICU and hospital length of stay (2, 8). It should be noted that studies have not shown a reduction in intubation with corticosteroid use. Given its known benefits in pharyngitis, which has a similar anatomy and pathogen range, and its potential to halt the progression of inflammation associated with epiglottitis, steroid use will likely continue to be a common adjunct in treatment. The recommended course of treatment in adults is intravenous (IV) dexamethasone 4 to 10 mg as an initial bolus followed by a repeated IV dose of 4 mg every 6 hours along with close observation of the airway. Other steroids, such as IV methylprednisolone 125 mg, can also be considered for administration in adults (8).

Nebulized epinephrine is a common adjunct in epiglottitis despite a lack of definitive data showing a proven benefit. Its use should be limited to a temporizing measure allowing for airway setup in an adult patient with impending airway obstruction (3). There has been a documented rebound effect after its administration and documentation from the late 1980s reports a rapid deterioration in these patients after its use (10). Nebulized epinephrine is not recommended in children due to associated agitation and possible laryngospasm that could cause clinical worsening. It should be used cautiously in the elderly or those with concerns for myocardial ischemia or arrhythmia (11).

Airway protection and planning should be at the forefront of management in epiglottitis given the possibility for rapid deterioration and challenges associated with a narrow or occluded airway from edema (2). Most patients can be observed safely in the ICU with supportive care, as previously discussed, but appropriate preparation is key (12). The patient should be kept in an upright position and position of comfort to prevent agitation (13). Preemptive intubation can be considered using supraglottic intubation, ideally in a surgical setting (2). Planning for a rapid surgical airway due to the risk of deterioration should be performed, including identification of landmarks and skin cleansing. Vocal cord visualization should be considered and is best achieved with fiberoptic or video laryngoscopy (2, 13, 14). If intubation is prolonged or difficult, signs of futility need to be recognized quickly and Cricothyrotomy performed.

4. Conclusion

Acute epiglottitis, traditionally considered a pediatric pathology, has seen a significant shift in demographics due to the Hib vaccine. Our patient presents a rare but increasingly encountered case of acute epiglottitis in an adult, manifesting with stridor, a hallmark symptom. Fortunately, our patient was stabilized without the immediate need for intubation and was subsequently transferred to the intensive care unit. While acute epiglottitis often necessitates urgent intubation in a surgical setting due to the risk of worsening airway compromise, our case underscores the importance of heightened awareness in adult emergency departments. Given the potential for rapid deterioration and associated morbidity and mortality, this case emphasizes the critical need for clinicians to maintain a high clinical suspicion for acute epiglottitis, particularly considering the shifting demographics towards older individuals and its life-threatening nature.

5. Declarations

5.1. Acknowledgments

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5.2. Ethical approval

This case report received ethical approval from the New York City Health and Hospitals Academic Committee at South Brooklyn Health (Confirmation Code: SBH-04-17). We conducted this study in accordance with the Helsinki Declaration as revised in 2013.

Verbal and written consent for publication was obtained from the patient.

5.3. Sources of funding

This work did not receive funding.

5.4. Conflict of interest

All authors have declared that they have no conflict of interest.

5.5. Authors' contribution

Study design: All authors.
Data gathering: All authors.
Data analysis: N/A.
Interpreting the findings: All authors.
Manuscript writing: All authors.
All authors read and approved the final version of the manuscript.

5.6. Using artificial intelligence chatbots

No artificial intelligence chatbots were used in drafting this manuscript.

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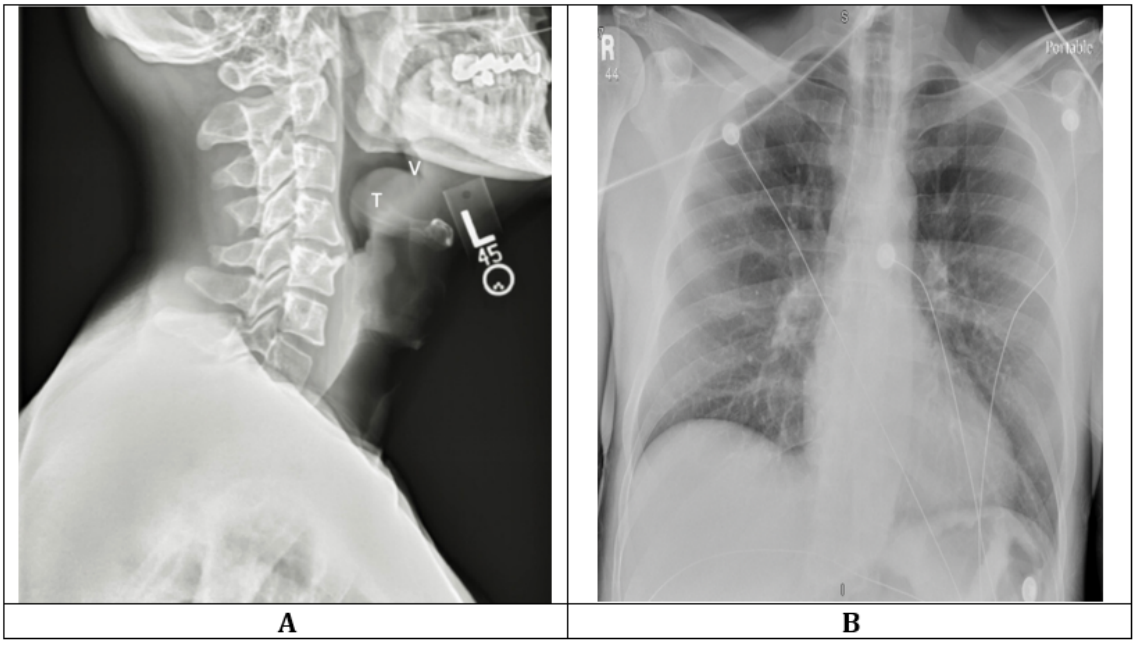

Figure 1: A) Lateral soft tissue neck radiograph demonstrating the "thumb print" sign (T) and the "vallecula sign" (V). B) Portable anterior posterior chest radiograph showing no evidence of active intrapulmonary disease.

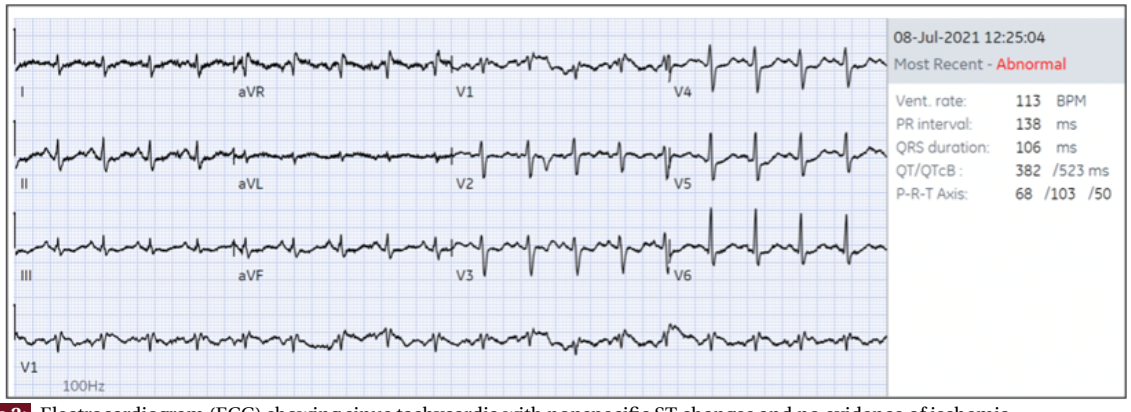

Figure 2: Electrocardiogram (ECG) showing sinus tachycardia with nonspecific ST changes and no evidence of ischemia.