CASE REPORT

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EBV associated epiglottitis in an immunocompetent child



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Abstract

Background The article presents a case report of subacute epiglottitis in a healthy three-year-old child, secondary to Epstein-Barr Virus (EBV) infection. This case is particularly significant as EBV-related epiglottitis is extremely rare, with only one prior reported case in a pediatric patient.

Case presentation A previously healthy three-year-old boy developed fever, cough, and difficulty breathing, initially diagnosed as croup but worsened, leading to hospital admission with respiratory distress, odynophagia and dysphagia. He had a hoarse voice, inspiratory stridor, swollen neck lymph nodes, increased work of breathing and hypoxemia, but was otherwise alert and nontoxic. Laboratory tests confirmed acute EBV infection, and imaging showed an enlarged epiglottis. The patient received supportive care, including oxygen therapy, and did not require intubation.

Conclusions The case highlights the importance of considering EBV as a potential cause of epiglottitis in pediatric patients.

Keywords Epiglottitis, Epstein-barr virus infections, Infectious mononucleosis, Airway obstruction, Pediatrics

Introduction

Since the introduction of HiB vaccines in 1985, the yearly occurrence of epiglottitis in children has significantly decreased [1], and Other organisms, such as various bacterial pathogens found in the oropharynx and naso-pharynx, have been involved. Moreover, there are rare instances of epiglottitis caused by viruses and fungi [2]. EBV infection has been reported as the cause of acute

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epiglottitis in an immunocompetent pediatric patient in only one case report [3].

In this case report, we describe the first case of subacute epiglottitis caused by EBV in a healthy pediatric patient, which is a very rare cause of this condition.

Case presentation

A previously healthy three-year-old child with no significant medical history presented to his primary care physician with a one-day history of fever, cough, and dyspnea. The patient was initially diagnosed with croup and prescribed oral dexamethasone, but showed no improvement. He was subsequently brought to our pediatric hospital due to respiratory distress, odynophagia, and dysphagia, without a history of choking.

Initial vital signs revealed tachypnea (respiratory rate = 39), tachycardia (heart rate = 170), hypoxemia



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Fig. 1 Lateral neck radiograph showing a markedly enlarged epiglottis (red arrow), commonly referred to as the "thumb sign"

(oxygen saturation was 91% on ambient air), no fever (T = 37 $^{\circ}$ C), and normal blood pressure (95/55).

On physical examination, he was nontoxic, alert but arousable, and he maintained his neck in mild extension. He had a hoarse voice and difficulty swallowing without drooling. He was noted to have increased work of breathing with subcostal and suprasternal retractions. He had inspiratory stridor. The patient had bilateral anterior cervical and submandibular lymphadenopathy, which was more prominent on the left side. Direct inspection of the oral cavity was avoided because it might provoke anxiety in our case. There was no organomegaly, and his perfusion was normal. The remainder of the physical examination was unremarkable.

Due to the presence of stridor, suprasternal retraction, odynophagia, dysphagia, asymmetrical cervical lymphadenopathy, and bilateral and equally clear breath sounds, we suspected an upper airway obstruction. Common infections that can affect the airway include croup, bacterial tracheitis, retropharyngeal and peritonsillar abscesses, infectious mononucleosis, and epiglottitis.

The patient's age, cough, stridor, and respiratory distress initially suggested croup as a diagnosis; however, the absence of a barking cough and the presence of odynophagia, and dysphagia contradicted this diagnosis. Furthermore, bacterial tracheitis was considered unlikely due to the lack of high fever, toxicity, purulent airway secretions, and the presence of dysphagia.

Retropharyngeal and peritonsillar abscesses were considered for the patient due to stridor, respiratory distress, cervical lymphadenopathy, and dysphagia. Although primary EBV infection is clinically silent in the majority of cases in infants and young children, the location of the lymphadenopathy, which was in the submandibular region, led to its inclusion in differential diagnoses.



Fig. 2 Contrast-enhanced CT image at the level of the epiglottis, revealing an edematous and thickened epiglottis (red arrow), with no evidence of retropharyngeal or peritonsillar abscess formation

Moreover, based on the stridor, fever, hoarse voice, and dysphagia, epiglottitis was also an important differential diagnosis.

Laboratory and radiographic findings included a complete blood count test significant for a white blood cell count of 13,300 (with neutrophils at 83%) and a platelet count of 87,000." Atypical lymphocytes were noted on the peripheral smear (40% of total lymphocytes). Blood culture was negative, and EBV serology (IgM antibody against viral capsid antigen) confirmed acute infection with high titer. The diagnosis of epiglottitis in our patient was confirmed by the presence of an enlarged epiglottis (the 'thumb sign') on lateral neck radiography (Fig. 1).

The otolaryngology (ENT) team was consulted for the evaluation of a possible retropharyngeal or peritonsillar abscess. Computed tomography (CT) with contrast of the neck revealed bilateral cervical lymphadenopathy and epiglottitis, but no retropharyngeal or peritonsillar abscess formation (Fig. 2).

The patient was admitted to the pediatric intensive care unit due to respiratory distress. He was started on maintenance intravenous fluids and oxygen therapy via nasal cannula. Ceftriaxone and vancomycin were also started for empiric antimicrobial coverage, but after 48 h, they were discontinued based on the CT report (which indicated the absence of abscess formation), a negative blood culture and positive serology for EBV infection. He was under continuous surveillance, and fortunately, he did not need intubation, and his respiratory distress improved with supportive care.

On hospital day two, the patient's vital signs had improved, and he defervesced. He was discharged on hospital day four in stable condition.

Discussion

Epiglottitis is characterized by the inflammation of the epiglottis and nearby supraglottic tissues, primarily due to infections [4]. Following the introduction of HiB vaccines, a rise in cases caused by new pathogens—including bacteria, viruses, and fungi—has led to a predominance of subacute forms of the condition [5]. Bacterial pathogens remain the most frequently identified cause of epiglottitis. Viral infections may rarely cause epiglottitis or enable bacterial superinfection [6]. Fungal infections are uncommon and typically occur in immunocompromised individuals [7]. In our case, the patient presented with subacute epiglottitis caused by Epstein-Barr Virus (EBV) infection.

Subacute epiglottitis is characterized by progressively worsening sore throat, mild fever, a muffled or hoarse voice, difficulty swallowing, and drooling [5]. Stridor is present in only a few patients, and sudden airway obstruction is less frequent than in acute epiglottitis but still possible [8]. Our patient with EBV-related subacute epiglottitis exhibited many typical signs and symptoms, such as fever, a hoarse voice, difficulty swallowing, and stridor, but did not experience drooling. Unlike acute epiglottitis, where a child might assume the tripod position to improve airway diameter [9], our patient showed only mild neck extension and did not require intubation. In addition, he had neck lymphadenopathy associated with EBV infection.

Primary EBV infections are common in young infants and children, often occurring without symptoms. When symptoms do present, they can include otitis media, diarrhea, abdominal issues, upper respiratory infections, and infectious mononucleosis (IM) [10]. In our patient, the primary EBV infection manifested as subacute epiglottitis, an upper respiratory infection, but also shared similarities with IM, which typically presents as a generalized systemic illness.

Infectious mononucleosis (IM) is a well-known acute manifestation of Epstein-Barr virus infection, typically starting with fever, fatigue, and pharyngitis, often accompanied by tonsillar exudate. Common physical exam findings include generalized lymphadenopathy (90% of cases), splenomegaly (50%), and hepatomegaly (10%). Lymphadenopathy frequently affects the anterior and posterior cervical nodes and submandibular nodes, and less often the axillary and inguinal nodes. Most patients (>90%) have leukocytosis ranging from 10,000 to 20,000 cells/µL, with at least two-thirds being lymphocytes, and atypical lymphocytes making up 20-40% of the total. Mild thrombocytopenia (50,000-200,000 platelets/µL) occurs in over half of the patients. Hepatic transaminase levels are mildly elevated in about 75% of uncomplicated cases, usually without symptoms or jaundice [11]. A rare but serious complication is upper airway obstruction due to massive tonsillar enlargement and mucosal edema [12]. Our patient had fever, bilateral anterior cervical and submandibular lymphadenopathy, atypical lymphocytes, and mild thrombocytopenia. However, due to the avoidance of direct inspection of the oral cavity, we did not observe any tonsillar exudates. The patient did not have hepatosplenomegaly, lymphocytosis, or elevated transaminases. Unlike infectious mononucleosis (IM), the epiglottis was the primary site of airway compromise.

Supportive care is the primary treatment for people with infectious mononucleosis (IM) and other forms of primary EBV disease. The use of corticosteroids for EBV-induced IM remains debated. Research on steroid therapy alone suggests that these drugs might slightly improve symptoms by reducing lymphoid and mucosal swelling. Corticosteroids should be considered in cases where there is a risk of airway obstruction, indicated by difficulty breathing or dyspnea when lying down [11, 13-15]. Our patient was given oral dexamethasone before hospital admission, but we decided not to continue corticosteroid treatment because our initial diagnosis was epiglottitis, which we confirmed through imaging. In contrast to EBV-induced IM, the epiglottis was the primary site of airway compromise in this case, and there was no tonsillar or mucosal swelling. Therefore, we treated the patient with supportive care only.

Conclusion

This case highlights the importance of considering Epstein-Barr Virus (EBV) as a potential cause of epiglottitis, even in immunocompetent pediatric patients, despite its rarity. Physicians should maintain a high index of suspicion for EBV-related epiglottitis in cases where signs of infectious mononucleosis (such as cervical lymphadenopathy, atypical lymphocytosis, and thrombocytopenia) are present alongside symptoms of epiglottitis, including stridor, fever, hoarse voice, and dysphagia. In such cases, early imaging is essential to confirm the diagnosis and assess for airway involvement. Additionally, serologic testing for EBV can provide critical diagnostic clarity when the clinical presentation is inconsistent with more common causes of epiglottitis.

Abbreviations

EBVEpstein-Barr VirusHiB vaccinesHaemophilus influenza type BIMInfectious Mononucleosis

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Author contributions

S. B. prepared the clinical data. A. M. wrote the main manuscript text. All authors reviewed the manuscript. All authors have read and approved the final manuscript.

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Data availability

Data is provided within the manuscript.

Declarations

Ethics approval and consent to participate

A comprehensive verbal description of the objectives of the study was given to the patient and written informed consent was obtained from the parents.

Consent for publication

Written informed consent for the publication of identifying clinical details and any accompanying images was obtained from the parents of the patient.

Competing interests

The authors declare no competing interests.

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