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**Dr. Mayyar Soheil Alkawadri**  
 Specialist Paediatric, Emirates  
 Hospital, Dubai, UAE

## A case report on epstein-barr virus-associated acute tonsillitis complicated by airway obstruction and hepatosplenic involvement

**Dr. Mayyar Soheil Alkawadri**

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### Abstract

This case report presents the clinical course and management of a 14-year-old patient, Theo, who initially presented with symptoms of acute tonsillitis, later complicated by airway obstruction and hepatosplenic involvement. This case highlights the diagnostic challenges in differentiating Epstein - Barr virus (EBV) infection from Streptococcal pharyngitis, the role of corticosteroids in managing impending airway obstruction, and the significance of pus on the tonsils in diagnosing bacterial infection. It also discusses the rare but serious complications associated with EBV infection.

**Keywords:** EBV, Tonsillitis, pharyngitis, lymphotropic, petechiae

### Introduction

Epstein - Barr virus (EBV) infection is a common viral illness that typically presents with symptoms such as fever, sore throat, and lymphadenopathy. Infectious mononucleosis (IM) is a prevalent illness that mostly affects teenagers and young people and is characterized by a high body temperature, throat pain, tiredness, lymphadenopathy, and splenomegaly. The Epstein-Barr virus (EBV), an affiliate of the herpes virus family, is responsible for the disease's aetiology. The virus's genome consists of around 85 genes located on a 177,000 base pair double-strand DNA helix (Baer *et al.*, 1984) [4]. The virus is thought to have infected 90% of the world's population, however the great majority of people keep asymptomatic during the illness. When symptoms do appear, they are often modest, and the illness is self-limiting.

EBV exhibits a lymphotropic nature, impacting predominantly B cells and secondary epithelial cells. *In vitro*, the encoding of the virus's genome inside the afflicted cells confers immortality (Young and Rickinson, 2004) [5]. Furthermore, the virus has the potential to latently infect a fraction of memory B cells, allowing it to remain forever buried in lymphoid cells, triggering an interaction entrenching the virus and the immune system's reaction (Hatton *et al.*, 2014) [6]. The disruption of the relationship underlying the virus and the body's immune system provides an explanation for the link between EBV infection and some autoimmune diseases (Wen *et al.*, 1996) [7]. Furthermore, the synthesis of the virus's latent genes in infected cells is thought to be a crucial role in its carcinogenic activity (Young and Rickinson, 2004) [5].

As previously stated, EBV infection can be asymptomatic or accompanied with IM symptoms. The predominant scientific findings in IM is severe lymphocytosis, which is caused by the virus's action on particular CD8 T cells. The infection normally clears up on its own, but in a small number of instances, serious consequences such as blocked airways, meningoencephalitis, hemolytic anaemia, thrombocytopenia, and rupture of the spleen can occur. Although hepatic involvement is prevalent in IM, cholecystitis is relatively rare.

In some cases, it can lead to severe complications, including airway obstruction and hepatosplenic involvement. This report describes the clinical presentation, diagnosis, and management of such a case.

### Case Presentation

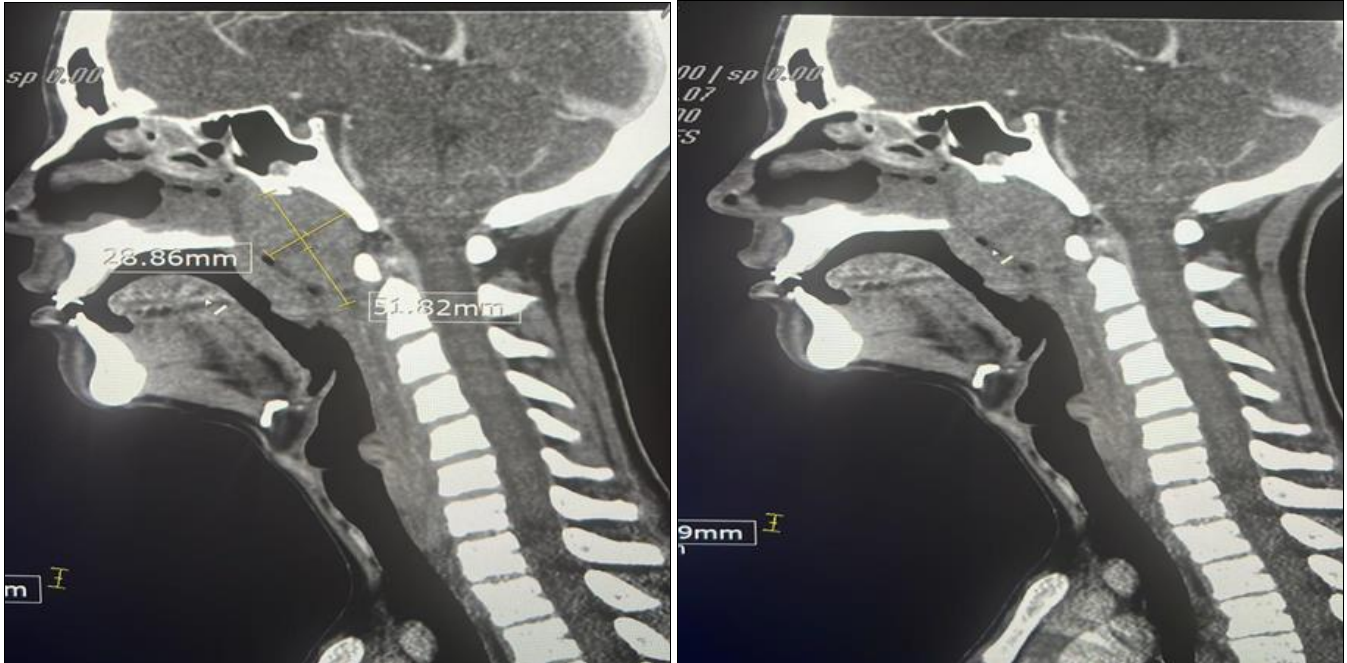
Theo, a 14-year-old male, presented to the outpatient department (OPD) with a three-day history of fever, throat pain, difficulty swallowing, and hoarseness. Physical examination revealed fatigue, dehydration, severe throat congestion, and enlarged tonsils with white tonsillar exudate. Cervical lymph nodes were enlarged with posterior and anterior exudate. Petechiae were observed on the palate. Abdominal examination revealed softness with mild splenomegaly and hepatomegaly.

**Corresponding Author:**  
**Dr. Mayyar Soheil Alkawadri**  
 Specialist Paediatric, Emirates  
 Hospital, Dubai, UAE

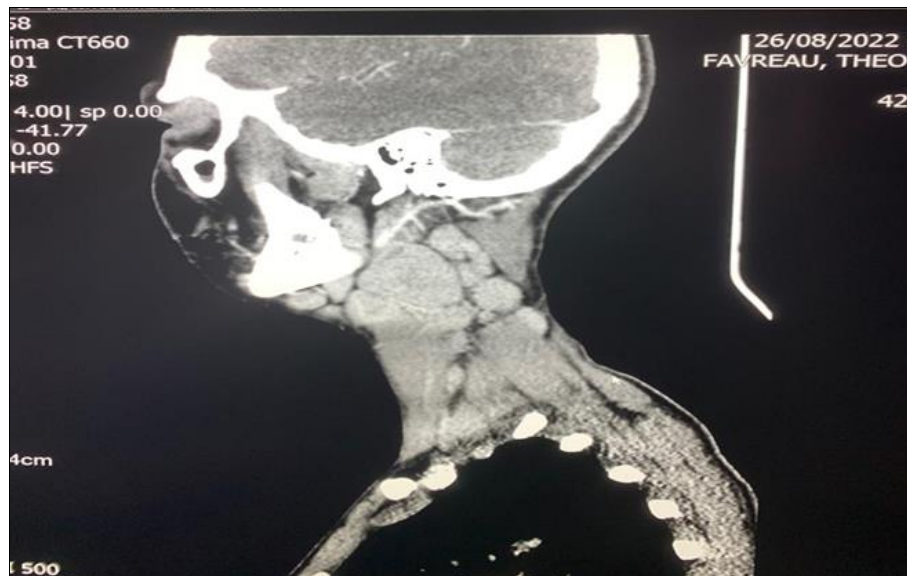
A diagnosis of acute tonsillitis was made, and treatment with amoxicillin and clavulanic acid was initiated. After three days, Theo's condition worsened, with moderate difficulty breathing and persistent fever. He was admitted to the hospital and started on ceftriaxone and clindamycin. Blood tests showed an elevated white blood cell count ( $13.44 \times 10^9/L$ ) with monocyte dominance (10.4%) and lymphocytosis (54.2%). There was an increase in AST (55 U/L) and ALT (39 U/L). The monospot test was negative, but EBV VCA IgM was positive. Blood culture came back negative.

Neck CT revealed significantly enlarged adenoids and tonsils, causing airway compromise, along with suppurative bilateral lymphadenitis and moderate retropharyngeal space edema suggestive of cellulitis. Intravenous solumedrol was added to the treatment regimen, and Theo was transferred to the ICU for observation due to impending airway obstruction.

Within two days, his respiratory distress improved, and his fever subsided. A follow-up abdominal ultrasound on day 9 revealed mesenteric lymph node enlargement, mild splenomegaly, and hepatomegaly.



**Fig 1:** Adenoids compressing the air way



**Fig 2:** Neck lymph node Enlargement

**Discussion**

Epstein-Barr Virus, often known as EBV or HHV-4, is a Herpesviridae virus that is thought to have infected more than 90% of the world's population (Smatti *et al.*, 2018) <sup>[1]</sup>. It is typically spread by bodily fluids, and while the symptoms of infection might be unpleasant, they nearly invariably consist of a benign self-limiting cycle of body

pains, sore throat, lethargy, and ultimate healing. Serious consequences are uncommon, with upper airway blockage (1-3.5%), rupture of the spleen (0.1-0.5%), and a wide spectrum of lymphoproliferative malignancies (which accounts for around 1% of all cancers) being the most prevalent (Fugl & Andersen, 2019; Bakkalci *et al.*, 2020) <sup>[2, 3]</sup>.

- 1. Close Symptoms between EBV and Strep:** This case underscores the challenge of differentiating between EBV infection and Streptococcal pharyngitis due to the overlapping clinical presentation. Negative monospot test results can further complicate the diagnosis.
- 2. Effective Corticosteroid Use:** The administration of corticosteroids, such as solumedrol, was crucial in managing airway compromise in this case. It highlights the potential benefits of corticosteroids in cases of impending airway obstruction associated with severe tonsillitis or lymphadenitis.
- 3. Pus on Tonsils Not Always Bacterial:** The presence of pus on the tonsils, as seen in this case, should not solely be interpreted as a sign of bacterial infection. Viral etiologies, such as EBV, can also lead to tonsillar exudate.
- 4. EBV Complications:** This case demonstrates the rare but serious complications associated with EBV infection, including airway obstruction, hepatomegaly, splenomegaly, and mesenteric lymphadenopathy.

#### Conflict of Interest

Not available

#### Financial Support

Not available

#### Conclusion

This case report highlights the diagnostic and management challenges in distinguishing EBV infection from Streptococcal pharyngitis, emphasizing the potential utility of corticosteroids in cases of impending airway obstruction. It also serves as a reminder that pus on the tonsils is not always indicative of bacterial infection. Clinicians should be vigilant for the rare but severe complications of EBV, including hepatosplenic involvement. Early recognition and prompt intervention are crucial for optimal patient outcomes.

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