



Bilateral Hilar Lymphadenopathy with Infectious Mononucleosis

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Abstract

A case of bilateral hilar lymphadenopathy associated with infectious mononucleosis (Epstein-Barr virus infection) in a 9-year-old boy who presented with fever, sore throat, and chest pain is described and published literature on hilar lymphadenopathy in infectious mononucleosis is discussed. This is the first reported case of bilateral hilar lymphadenopathy with Epstein Barr infection in the absence of other pulmonary pathology. It is important for clinicians to be aware of this possibility in children with infectious mononucleosis presenting with chest pain.

Keywords: Hilar lymphadenopathy; Epstein-Barr virus; Infectious mononucleosis

Abbreviations

BHL: Bilateral Hilar Lymphadenopathy; ECG: Electrocardiogram; EBV: Epstein-Barr Virus; ALT: Alanine Transaminase; AST: Aspartate Aminotransferase; EBNA: Anti-Epstein Barr Nuclear Antigen; VCA: Viral Capsid Antibody; IgM: Immunoglobulin M; IgG: Immunoglobulin G; CT: Computed Tomography

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Background

Bilateral Hilar Lymphadenopathy (BHL) is not a common problem in healthy children and warrants prompt evaluation to exclude serious infections, inflammatory conditions or neoplastic processes. The work up to delineate the etiology is directed by a careful history and physical examination along with laboratory and radiological testing to confirm or, more importantly, exclude other possible diagnoses.

Case Presentation

A 9-year-old boy presented with a 5 day history of fever, sore throat, rhinorrhea, and myalgias. He initially presented to his family doctor, on the day of his illness, with fever and sore throat and the patient was commenced on amoxicillin for presumed streptococcus pharyngitis. His six year old brother had culture positive streptococcal pharyngitis which was complicated by a retropharyngeal abscess and was admitted to the hospital. The patient presented to our emergency department 48 hours later, complaining of increasing throat pain, fever continued with productive cough. His physical exam revealed diffuse pharyngeal erythema with moderately enlarged tonsils and the presence of several enlarged, tender anterior and posterior cervical lymph nodes. Lateral neck x-ray for soft tissue was normal. The patient was continued on amoxicillin and started on clindamycin and oral morphine was prescribed for pain control. The following day, he presented to the emergency department with chest pain and persistent pain to the throat. There was no history of shortness of breath or drooling. The child was afebrile, with heart rate 97 beat per minute, respiratory rate 18 breaths per minute, blood pressure 116/60 mmHg. Oxygen saturation was 99% on room air. He was alert and not in respiratory distress. There were enlarged tonsils with exudates, a few small (<0.05 centimeters) bilateral cervical, jugulo-digastric, and apical axillary lymph nodes. He had no other palpable lymph nodes. Heart sounds were normal with no murmur. Auscultation of the



Figure 1: Chest x-ray at presentation shows bilateral hilar lymphadenopathy with no consolidation.



Figure 2: Chest x-ray 4 weeks follow up shows complete resolution of right hilar lymphadenopathy and stable mild residual left hilar lymphadenopathy.

lungs revealed good bilateral air entry with no adventitious sounds. The abdomen was soft, non-tender with no hepatosplenomegaly. The musculoskeletal and dermatologic examinations were normal. There was no evidence of neurological abnormality.

A 12-lead Electrocardiogram (ECG) and a chest x-ray were ordered to investigate chest pain. The ECG was within normal limits. The chest x-ray showed markedly enlarged bilateral hilar lymphadenopathy with no focal consolidation (Figure 1). In view of the x-ray findings, further investigations were done and the oncology team was consulted.

The patient's hemoglobin and platelets count were within normal limits at 13.3 g/dl and a 355,000 $10^9/L$ respectively; white cell count was $11.3 \times 10^9/L$; (2.14 neutrophils; 4.17 lymphocytes with 3.09 atypical lymphocytes). He had elevated liver transaminases with ALT 372 U/L and AST 324 U/L; elevated lactate dehydrogenase level of 1531 IU/L and elevated Ferritin level of 532 ug/L. Renal function, electrolytes measurements, venous blood gas, coagulation profile, troponin and amylase levels were within the normal reference range. His erythrocyte sedimentation rate was 17 mm/hour, and a C-reactive protein was 6.4 mg/dl. The blood smear was examined by both the haemopathologist and oncologist and was confirmed as showing no blast cells. The heterophile antibody test was positive.

In consultation with the oncology team, a presumptive clinical diagnosis of possible Epstein-Barr Virus (EBV) infection with hilar lymphadenopathy was made and the child was discharged home. He returned the next day due to poor feeding due to increasing throat pain; he was admitted to the general paediatrics ward for a day and received intravenous hydration and pain management with ketorolac and oral hydromorphone.

EBV serology including EBV heterophilic antibodies, anti-Epstein Barr Nuclear Antigen (anti-EBNA), and anti-Viral Capsid Antibody (anti-VCA) of Immunoglobulin M (IgM) and Immunoglobulin G (IgG) were positive. A 3-fold increase of IgM titer for antibodies against EBV VCA. At a follow up visit in four weeks, the patient had full clinical recovery and his repeat x-ray showed complete resolution of right hilar lymphadenopathy and stable mild residual left hilar lymphadenopathy (Figure 2).

Discussion

This is the first reported case of hilar lymphadenopathy in a child with EBV infection in the absence of pulmonary pathology. There are few cases report of hilar lymphadenopathy associated with EBV infection in adults where all patients had associated

pulmonary infections and needed inpatient treatment and hilar lymphadenopathy in 2 children with both having EBV infection and *Mycoplasma pneumoniae* [1-4]. (Please see detail in Table 1).

The diagnosis of infectious mononucleosis is suggested by a triad of symptoms: fever, pharyngitis, and lymphadenopathy, often preceded by a prodrome of headache, malaise, and fatigue for 4 days to 5 days [5]. Laboratory tests confirm the diagnosis. Infectious mononucleosis usually gives rise to elevated white blood cell count, absolute lymphocytosis (usually 50% to 60% lymphocytes), with atypical lymphocytes in peripheral blood smears (at least 10% atypical lymphocytes) and a positive heterophile antibody (mono spot) test [6]. Serological testing for elevated levels of IgM and IgG to the viral capsid antigen, IgM to the early antigen, and antibody to EBNA confirms of EBV infection [7]. There is no vaccine or specific antiviral treatment for infectious mononucleosis. Supportive care by managing the fever, throat pain, malaise, and ensuring adequate fluid intake and nutrition are the only management options [7].

Positive culture for group A streptococcal in a patient with positive EBV may indicate colonization or co-infection. Cases with streptococcal infection and infectious mononucleosis have been reported [7]. Distinction between which infection is responsible for the symptoms is important as antimicrobial therapy to treat group A streptococcal pharyngitis is required to prevent acute rheumatic fever and reduce complications [8,9]. It also has been reported that pneumonitis and pleural effusion have occurred with infectious mononucleosis and *Mycoplasma pneumoniae* [3,4].

The majority of patients with infectious mononucleosis recover without sequelae and return to normal activities within 1 month to 2 months after the onset of symptoms [10,11]. Hematologic and neurologic complications of EBV infection are well described [7,12]. Splenic rupture and upper airway obstruction due to lymphoid hyperplasia and mucosal edema are rare but potentially life-threatening complications. In addition, an association between EBV infection and Burkitt's lymphoma or nasopharyngeal Carcinoma has been recognized [13-15]. Lower respiratory tract complications include pneumonia, pleural effusion, and mediastinal lymphadenopathy [16].

Hilar lymphadenopathy is usually a radiological diagnosis that describes the enlargement of mediastinal lymph nodes. When present, serious immunologic and neoplastic etiologies should be considered. A recent study by Pim et al. reported that detection of lymph nodes is common at several mediastinal and hilar locations in normal children due to the availability of advanced CT technology. Size, location and

Table 1: Reported cases hilar lymphadenopathy with EBV infection.

Study	Patient	Presentation	Physical examination	Chest x-ray findings	Comments
Greenstone [4]	10 year old male	Fever, sore throat, malaise, cough, and respiratory distress.	Tachypnea, retractions, cervical lymphadenopathy and hepatosplenomegaly.	Severe pneumonia in the right upper lobe, mild changes in the two lower lobes and hilar adenopathy.	Infectious mononucleosis with associated mycoplasmal pneumonitis Admitted to hospital
	12.5 year old female	Fever, fatigue, cough, chills, chest pain, and dyspnea	Cervical lymphadenopathy, bilateral rales, and hepatosplenomegaly	Bilateral diffuse interstitial pulmonary infiltrates with mild hilar adenopathy	Infectious mononucleosis with associated mycoplasmal pneumonitis Admitted to hospital
Friedland et al. [1]	43 year old male	Fever, exertional dyspnea, general malaise, sweats and myalgia	Pale, right sub- mandibular, right axillary and bilateral inguinal lymph and right basal inspiratory crackles.	Revealed bilateral hilar lymphadenopathy and some right basal linear shadowing	Admitted to hospital
Highland et al. [2]	29 year old male	Sore throat ,weakness fatigue, night sweats, nausea, and right-upper-quadrant pain	Dyspnea, jaundiced. O2 sat 91%, marked cervical and inguinal adenopathy, an erythematous oropharynx, bilateral bronchial breath sounds, and splenomegaly.	Bilateral hilar adenopathy, bilateral alveolar and interstitial infiltrates.	Admitted to hospital ICU ¹ admission as he needed intubation
Archibald et al. [3]	19 year old female	Fever, malaise, chest pain recurrent minor hemoptysis	Pharyngitis, lymphadenopathy,	Initially reported as normal	CT ² scan: left lingular consolidation and pleural effusion, left-sided mediastinal lymphadenopathy constricting the origin of the main pulmonary artery Admitted to hospital

¹Intensive Care Unit; ²Computed Tomograph

age of the patient should be taken into consideration as the size and location of normal lymph nodes is of great diagnostic value when evaluating lymphadenopathy by CT scan modality [17].

Ebstein Barr viral infection is a common childhood infection and is not a usual cause of hilar lymphadenopathy. This case demonstrates that radiological evaluation for children presenting with chest pain is necessary and that hilar lymphadenopathy can be due to EBV infection in children even in the absence of pulmonary disease. It is important to further investigate hilar lymphadenopathy on chest x-rays in patients with possible EBV infection to exclude other pathology and follow up to confirm resolution of abnormal findings.

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