

Lung Abscess in Children: Current Perspective

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Abstract: Lung abscess is a rare but critical problem in childhood. It is suppurative necrosis of lung parenchyma due to nonspecific bacterial infection. Children with a lung abscess have a significantly better prognosis than adults with the same condition¹. We report a 17 month-old child with lung abscess which is probably one of the few cases reported in the literature in the modern antibiotic era.

Keywords: Lung abscess, children.

I. Introduction

Lung abscess remains a challenge to treat and can be life threatening if early diagnosis is not done. Here we describe a case of lung abscess managed conservatively.

II. Case Report

A 17 month old male child was admitted to a tertiary care center with history of high grade fever since 11 days and productive cough since 3 days. He had associated anorexia, lethargy but no history of weight loss. He was previously well without underlying cardiovascular, neurological or respiratory disease and he had no history of skin, soft tissue, gastrointestinal infections suggesting abnormal humoral or cell mediated immunity. There was no known tuberculosis exposure or history compatible with foreign body aspiration. He had received antibiotic therapy with adequate doses of amoxicillin and clavulanic acid for 1 week prior to hospital admission. There was no family history of hemoglobinopathy or disorders of complement or immunoglobulin's, nor was there any family history of recurrent illness consistent with any known states of inherited or acquired immunodeficiency.

Upon physical examination, the child had pallor with respiratory distress, anthropometry percentiles were in normal range. The patient had normal dentition without obvious dental carries or periodontitis. Chest movements were decreased on left side, fine crepitation were heard over the left mammillary area, tactile vocal fremitus and vocal resonance were increased on left side otherwise rest of the examination was normal.

Complete blood count revealed leukocyte count of $28 \times 10^9/L$ with 60% mature neutrophils, band forms 5%, 30% lymphocytes, and 5% monocytes; hemoglobin of 7.8 g/L; and platelet count of $808 \times 10^9/L$. The sputum evaluation was normal and Mantoux skin testing for tuberculosis was negative. X-ray chest revealed obliteration of left costophrenic angle with lung shadow suggestive of pleural effusion or empyema. So a High Resolution Computed Tomography (HRCT) of the Lung was done suggestive of a large cavity with air-fluid level in the apical and posterior basal segment of left lower lobe with patchy consolidation was seen on his computed tomography, confirming the diagnosis. The immunoglobulin levels were: IgG, 965 mg/dL (normal range 313-1,170 mg/dL) IgA, 73 mg/dL (normal range 36-79 mg/dL); and IgM, 124 mg/dL (normal range 46-152 mg/dL). These findings are consistent with a normal response to acute infection. Patient was started on Piperacillin/tazobactam injection, vancomycin and physiotherapy. Pediatric surgery reference was also taken and was managed conservatively. Patient repeat investigation suggests improvement and was discharged on oral linezolid and cefixime-clavulanic acid for total of 4 week duration of antibiotics.

III. Discussion

Lung abscess is a localized area of suppuration and necrosis involving 1 or more areas of the lung parenchyma. It may communicate with an airway and cause partial expectoration of the purulent content and a resultant air-fluid level. It's incidence among children is 0.7/100000 admissions per year,² which may be due to advances in field of antibiotics. It is further classified as primary lung abscesses which are seen in healthy children and secondary are those developing in a child with predisposing factors, include pneumonia, aspiration, tracheoesophageal fistula, immunodeficiencies, gastro esophageal reflux, postoperative complications of tonsillectomy and adenoidectomy, seizures and other neurological conditions.³ In children, aspiration of infected materials or a foreign body is the predominant source of the organisms causing abscesses. Lung inflammation impairs drainage of fluid or the aspirate causing inflammation further causing vascular obstruction, resulting in tissue necrosis, liquefaction, and abscess.

Primary lung abscess predominantly develop on the right side³ unlike our case and are almost always solitary. If aspiration is the cause, then the upper lobes of either side are commonly involved. In pediatric patients lung abscess is believed to develop secondarily to bacterial pneumonia.⁴ Staphylococcus aureus, Streptococcal species, and Klebsiella pneumonia are the common pathogens isolated from primary lung abscesses.⁵ Common differential diagnosis includes infected congenital cystic abnormalities of the lung such as cystic adenomatoid malformation, bronchogenic cyst, and late-presenting congenital right-sided diaphragmatic hernia.⁶ Children with a lung abscess for both types, have a significantly better prognosis than adults⁷. By chest radiographic scans Lung abscess can be diagnosed, showing a thick-walled cavity containing an air-fluid level.⁸

A retrospective review of 23 lung abscess children over a 20-year period revealed among the 23 children, 11 cases were primary, and 12 were secondary lung abscess, and they could isolate pathogens in 16 patients and blood cultures yielded in only 3 patients (13.0%) only, and the most common microorganism was streptococcus pneumoniae.⁶ In another retrospective study from taiwan out of 27 children over a period of 16 years, 70% had underlying chronic diseases, and aspiration yielded 63.6 % positive cases.⁷

The treatment of choice for lung abscess is conservative medical management, which should include a parenteral antibiotic with gram-positive activity against both staphylococcus aureus and anaerobes for a minimum of 3 weeks for uncomplicated cases, followed by a course of oral antibiotics to complete a total of 4-6 wk.^{5,8} Surgical intervention such as lobectomy should be reserved for those with very severe abscesses and who does not show clinical and radiologic evidence of improvement after at least 3 weeks of appropriate intravenous antibiotic therapy.⁸ Overall prognosis is good for primary lung abscess. For secondary lung abscess presence of aerobic organism is negative prognostic indicator³. Fever can persist for as long as 3 weeks. Most children become asymptomatic with 7-10 days and radiological findings can persist for 1-3 months to years.

IV. Conclusion

Although rare lung abscess can be one of the differential diagnoses of persistent cough and High Resolution Computed Tomography (HRCT) of the Lung can be a good diagnostic tool for diagnosis and appropriate treatment.

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