

# Right upper lobe lung abscess in an infant: A diagnostic dilemma.

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## Abstract

Lung abscess is infrequently encountered in the pediatric population after the introduction of modern antibiotics. We present a case of right upper lobe lung abscess in a 4-month-old boy, who was previously treated for left upper lobe pulmonary consolidation with intravenous antibiotics. The abscess was treated successfully by right thoracotomy and tube drainage as it was misdiagnosed as a bronchogenic or neurogenic cyst on CT scan. Post-operative recovery was uneventful. Due to the rarity of lung abscess in infancy in the modern era, we are reporting this case.

## INTRODUCTION

Lung abscess was a dreaded disease in the earlier part of the last century, before the introduction of the modern antibiotics, with mortality in one third of the patients, recovery in one third and a chronic debilitating disease such as recurrent abscesses, chronic empyema, bronchiectasis, or other consequences of chronic pyogenic infections in the remaining patients.<sup>1</sup> It was only after the introduction of penicillin and tetracycline that the incidence of lung abscess was significantly brought down and the management shifted from resectional surgery towards more conservative approaches based on antibiotic therapy. Present-day surgical treatment is nearly limited to needle aspiration under sonographic guidance. Thoracotomy is only reserved for cases where adequate medical therapy with aspiration or tube drainage fails to cure the disease,<sup>2</sup> or if there is a diagnostic dilemma as in our case.

## CASE REPORT

A 4-month-old baby came to us with high-grade fever, cough and breathing difficulty. On examination, he was febrile, with tachypnea and tachycardia. There were bilateral crepitations in the chest, with decreased breath sounds in the left upper zone. Investigation revealed leukocytosis with high neutrophil count. The blood culture was sterile and the chest x-ray showed a homogenous opacity in the left upper zone (Fig. 1).

## Figure 1

Figure 1: Chest radiograph at 1 admission



He was hospitalized and intravenous cefotaxime and amikacin were given for 10 days. The child had complete clinical and radiological resolution when he was discharged. The baby developed similar problems again after 7 days, but the x-ray this time revealed a patch in the right upper zone. In absence of any history of any recurrent aspiration in the baby, a detailed work-up of the immune status was done to ascertain the cause of recurrent pneumonia. The immunological profile was found to be within normal limits and the ELISA for HIV was also non-reactive. There was no symptomatic improvement in the child even after 4 days of Co-Amoxiclav given intravenously. A CT of the chest was

done which showed a hypodense lesion in the apex of the right lung with septations and a diagnosis of doubtful bronchogenic or neurogenic cyst was made. A thoracotomy was done to remove the offending lesion, which revealed a big abscess in the left upper lobe which was drained externally with a chest tube. The wall of the abscess, which was sent for biopsy, demonstrated lung tissue. There was radiological clearance after 2 weeks of antibiotic therapy and the child continues to be asymptomatic after 4 months of follow-up.

## DISCUSSION

Primary lung abscesses are the ones developing in a previously healthy child, whereas secondary lung abscesses are those developing in a child with some other disease or in a child with predisposing factors like aspiration, pneumonia, cystic fibrosis, gastro-esophageal reflux or immunodeficiency. The side and the lobar involvement is greatly influenced by the etiology, e.g. primary lung abscess is predominantly a right-sided disease and if aspiration is the cause then the upper lobes of either side are commonly involved.

Advances in the field of antibiotics have drastically reduced the incidence of lung abscesses in the recent decades. They are infrequently encountered in children these days, with only a few having been documented in modern times.<sup>3</sup> This case which we are reporting was a 4-month-old male and is probably the only case to be reported in world literature in infants in the modern antibiotic era. Lung abscesses were less commonly seen in the pediatric population than in adults, even before the introduction of the modern antibiotics, with rare encounters in infancy.<sup>2</sup>

Lung abscess in pediatric patients is believed to develop secondary to bacterial pneumonia.<sup>4</sup> Immunodeficiency or immunosuppressant states caused by viral infections are the other predisposing causes. Other less common causes of lung abscess are cystic fibrosis, alpha-1 antitrypsin deficiency, anesthesia and dental surgery.<sup>5</sup> Though many organisms are responsible for causing lung abscess, anaerobic microorganisms are the

most common etiological agents.<sup>4</sup> Among the aerobic organisms, *Staphylococcus aureus*, *Klebsiella* spp. and *Pseudomonas aeruginosa* are common, while the most common anaerobes are *Bacteroides* spp., *Peptostreptococcus*, *Fusobacterium* spp., micro-aerophilic *Streptococcus* and *Veillonella*.<sup>6</sup> The mortality is higher with anaerobes. Fungal and protozoal agents may be seen in

immunocompromised patients.<sup>5</sup> Few cases of *Salmonella* lung abscess have also been reported.<sup>7</sup>

Diagnostic difficulty is known to occur even with the modern investigating modalities. In fact, in our case, the lung abscess was diagnosed only at thoracotomy although the chest CT findings suggested a diagnosis of bronchogenic or neurogenic cyst. Common differential diagnosis includes infected congenital cystic abnormalities of the lung such as bronchogenic cyst and cystic adenomatoid malformation and late-presenting congenital right-sided diaphragmatic hernia.<sup>8</sup>

Management of lung abscess predominantly is based on administration of parenteral antibiotics with anaerobic and staphylococcal coverage, replacing the older methods like pneumonostomy,<sup>9</sup> catheter drainage and resectional surgery. Additional computerized tomography (CT)-guided percutaneous drainage or other surgical interventions may become mandatory occasionally, if there is an incomplete or inadequate response to parenteral antibiotics alone.<sup>10,11</sup> Transtracheal aspiration and drainage are very recently introduced techniques.<sup>7,8</sup> Complications like pleural hemorrhage, empyema, bronchopleural fistula, or pneumothorax may occur with all these procedures. A thoracotomy was done in our case due to suspicion of bronchogenic or neurogenic cyst and revealed a lung abscess for which tube drainage was done.

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