

# Lung abscess in a child secondary to *Mycoplasma pneumoniae* infection

*Ascesso polmonare in un bambino secondario a infezione da *Mycoplasma pneumoniae**

E. Ruffini,<sup>1</sup> L. De Petris,<sup>1</sup> P. Candelotti,<sup>1</sup> M. Tulli,<sup>1</sup> M. R. Sabatini,<sup>1</sup> L. Luciani,<sup>1</sup> A. Carlucci<sup>1</sup>

**Key words:** Lung abscess, *Mycoplasma pneumoniae*, Child

## Abstract

Lung abscess is a very rare infectious condition in children and is most commonly encountered as a complication of bacterial pneumonia.

We present a case of a lung abscess in a child 6-year-old admitted with a history of right hemithorax pain lasting for 15 days and the onset of mild fever in the last two days. Etiological research showed positivity of IgM antibodies to *Mycoplasma pneumoniae* after seven days of admission. The child has been successfully treated with antibiotic therapy, without the use of macrolides, for a duration of 4 weeks.

Our study suggests that the *Mycoplasma pneumoniae* infection may predispose to severe infections, such as lung abscess, caused by typical respiratory pathogens.

The reported case of lung abscess is one of the few reported in the literature in the modern antibiotic era and is the first preceded by *Mycoplasma pneumoniae* infection.

## Introduction

Lung abscess is a very rare infectious condition in children. The incidence has decreased dramatically during the antibiotic era and is actually about 0.7 per 100,000 admissions per year.<sup>1</sup>

Lung abscesses may be single or multiple, and are classically divided into primary and secondary according with their appearance in

previously well children or in those with predisposing co-morbidities.<sup>2</sup> Most lung abscess cases in pediatric patients are believed to develop secondary to bacterial pneumonia.<sup>3</sup> Other predisposing factors for development of lung abscess include immunodeficiency or immunosuppression states caused by viral infections, severe systemic diseases and conditions leading to repeated aspiration.<sup>2</sup> Less common causes of lung abscess are cystic fibrosis, alpha-1 antitrypsin deficiency, anesthesia and dental surgery.<sup>3</sup> Mortality rate is estimated about 5%, predominantly in children with predisposing conditions.<sup>4</sup>

We report the case of a lung abscess in a child secondary to *Mycoplasma pneumoniae* infection.

## Case report

A previously healthy 6-year-old male of Asian origin, adopted by an Italian family at the age of 4 years, was admitted with a history of right hemithorax pain lasting for 15 days and the onset of mild fever in the last two days. Physical examination revealed a well-nourished child with a temperature of 37.5°C, a respiratory rate of 35/minute and a heart rate of 118/minute. Auscultation of the lungs revealed decreased respiratory sounds in the right upper zone. Remaining physical examination was normal. Initial investigations revealed: total leucocyte blood count was 16900/mm<sup>3</sup> with 79% neutrophiles; C-reactive protein was 6 mg/dl; while other blood tests were normal. Chest X-ray showed a large well-circumscribed consolidated lesion of the right upper lobe with an air fluid level [Figure 1]. Computed tomography scan of the chest confirmed the presence of 40-mm thick-walled cavitory lesion containing an air-fluid level in the right upper lobe with surrounding normal lung tissue consistent with lung abscess [Figure 2]. Based on the radiological results, parenteral antibiotic therapy with vancomycin, clindamycin and ceftazidime was initiated. Blood culture was sterile while the values of the sweat chloride test and alpha-1 antitrypsin were normal. The tuberculin skin test was negative. Research of IgM antibodies to *M. pneumoniae* was positive after seven days of admission. The child became afebrile within 3 days

<sup>1</sup> Pediatrics and Neonatology Division, Maternal and Infant Department, Mazzoni Hospital, Ascoli Piceno, Italy

Indirizzo per la corrispondenza (Corresponding author):

E. Ruffini

Pediatrics and Neonatology Division, Maternal and Infant Department, Mazzoni Hospital

Via degli Iris, 1

63100, Ascoli Piceno - Italy

E-mail: eruffini@libero.it



Figura 1.

The chest radiograph demonstrates a large well-circumscribed consolidated lesion of the right upper lobe with an air fluid level

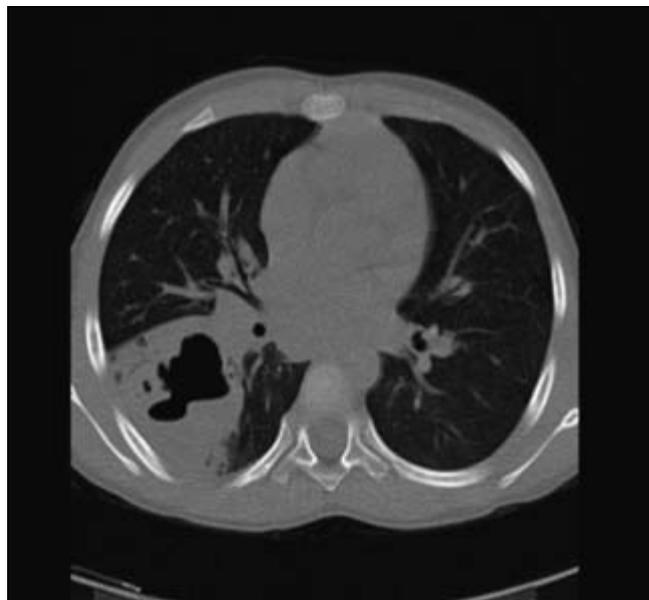


Figura 2.

Computed tomography scan of chest showing 40-mm-thick walled cavitary lesion with air fluid in the right upper lobe

of the administration of antibiotics and, for this reason, the initial therapy was continued for 2 weeks and followed by oral clindamycin for another 2 weeks. For the rest of his stay in hospital the patient remained afebrile and was discharged after 2 weeks. X-ray control performed at 60 days showed normalization of the image pulmonary.

## Discussion

A lung abscess is a localized infection with central necrosis and supuration of the lung parenchyma, surrounded by a thick wall of infected and inflammatory tissue<sup>4</sup>. The most common microorganisms causing lung abscess in children include Gram-positive cocci (*Staphylococcus aureus* and *Streptococcus pneumoniae*) and anaerobic bacteria and, in cases of suspected aspiration or immunocompromised patients, also some Gram-negative organisms (*Pseudomonas aeruginosa* and *Klebsiella pneumoniae*).<sup>5</sup>

Review of 23 lung abscess cases in children over a 20-year period revealed that 16 patients had isolated pathogens and the most common microorganism was *S. pneumoniae*.<sup>6</sup>

In a report of 45 pediatric lung abscess cases the most common pathogens in immunocompetent children were primarily *S. pneumoniae*, anaerobic bacteria and *St. aureus*.<sup>4</sup> The gold standard medical therapy for lung abscess is administration of empiric parenteral antibiotics with anaerobic bacteria and Gram-positive cocci coverage.<sup>7</sup> Early treatment can prevent further complications and can reduce the chance of obligatory surgical interventions.<sup>7</sup> In children, the role of surgical therapy for lung abscess should be limited only to a minority of patients who are refractory to medical treatment or who develop complications such as bronchopleural fistula.<sup>4</sup>

Lung abscess in children is a rare complication of *M. pneumoniae* infection and only four previous cases have been described in the literature. In all these cases there was delayed diagnosis of infection and healing only after administration of macrolides.<sup>8,9,10,11</sup> However, no cases of lung abscess preceded by *M. pneumoniae* infection in children has been reported the literature. Several authors have suggested that the microorganism causes mucociliary dysfunction, like respiratory viruses, and may predispose to secondary bacterial infection<sup>12</sup>.

*M. pneumoniae* adheres to the respiratory epithelium by attaching to the ciliary cell surface.<sup>13</sup> Cytoadhesion protects *M. pneumoniae* from mucociliary clearance and affects its integrity in several ways.<sup>13,14</sup> The production of hydrogen peroxide has a cytopathic effect that leads to a loss of ciliar activity and, finally, to epithelium alterations.<sup>14</sup> These alterations may predispose the respiratory tract to infection from copathogens, often *S. pneumoniae*, that alter the clinical picture.<sup>13</sup> Etiological studies reported evidence of *S. pneumoniae* and *M. pneumoniae* co-infection in 29 ambulatory or hospital-treated children with pneumonia.<sup>15</sup> Other authors reported four patients with serious bacterial infections after or concurrently with *M. pneumoniae* respiratory infections.<sup>16</sup> Toikka P. et al, recently confirmed coinfection in nine children with community acquired pneumonia. They revealed that 78% of the patients had been ill for a week or more before admission, supporting the view that *M. pneumoniae* infection probably precedes *S. pneumoniae* infection.<sup>12</sup> In our study undiagnosed *M. pneumoniae* infection was followed by a copathogen infection, not shown by the blood culture, that caused the lung abscess. This was indirectly confirmed by the ready clinical response to antibiotic therapy with agents not active to the *M. pneumoniae*.

In conclusion, the reported case of lung abscess is one of the few reported in the literature in the modern antibiotic era and is the first preceded by *M. pneumoniae* infection.

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