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Case report

# Unilateral double round pneumonia in a child: A case report and literature review ☆,☆☆

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ABSTRACT

Round pneumonia is a disease that occurs mainly in young children who have a clinical presentation of lower respiratory tract infection together with a chest radiograph showing round opacity. The mean age of patients with round pneumonia is five 5 years; it is uncommonly seen after the age of 8, as the collateral airways tend to be well developed by this age. In our case, we evaluated a 10-year-old girl who presented with fever, cough, and rounded densities on her chest x-ray. The rapid urinary antigen test for Streptococcus pneumoniae was positive, and serum anti-Mycoplasma pneumoniae antibodies were non-reactive. The diagnosis of round pneumonia was confirmed when the patient showed a complete recovery both clinically and radiographically after a course of penicillin and gentamicin.



## Introduction

Round pneumonia is a type of pneumonia that presents mainly in young pediatric populations, with the mean age at presentation being 5 years. It is uncommonly seen after the age of 8, as the collateral airways tend to be well developed by this age. Radiographically, it may appear as a round or oval opacity. These features mimic mass lesions, thus causing anxiety to the physician and family. The patient usually presents with clinical features of lower respiratory tract infection and round opacities in chest radiographs [1,2].

In this article, we present a case of round pneumonia in a 10-year-old girl, in which her first chest X-ray (CXR) showed nodular opacities mimicking a lung mass. Complete resolution of her clinical and radiological findings occurred after a course of antibiotics. Recent recommendations in the literature were reviewed.

## A case report

A previously healthy 10-year-old girl presented in the emergency room with a 5-day history of intermittent fever reaching up to 39°C, associated with a dry cough. She denied any sputum, hemoptysis, or rhinorrhea. She had malaise and decreased appetite. There was no history of contact with a

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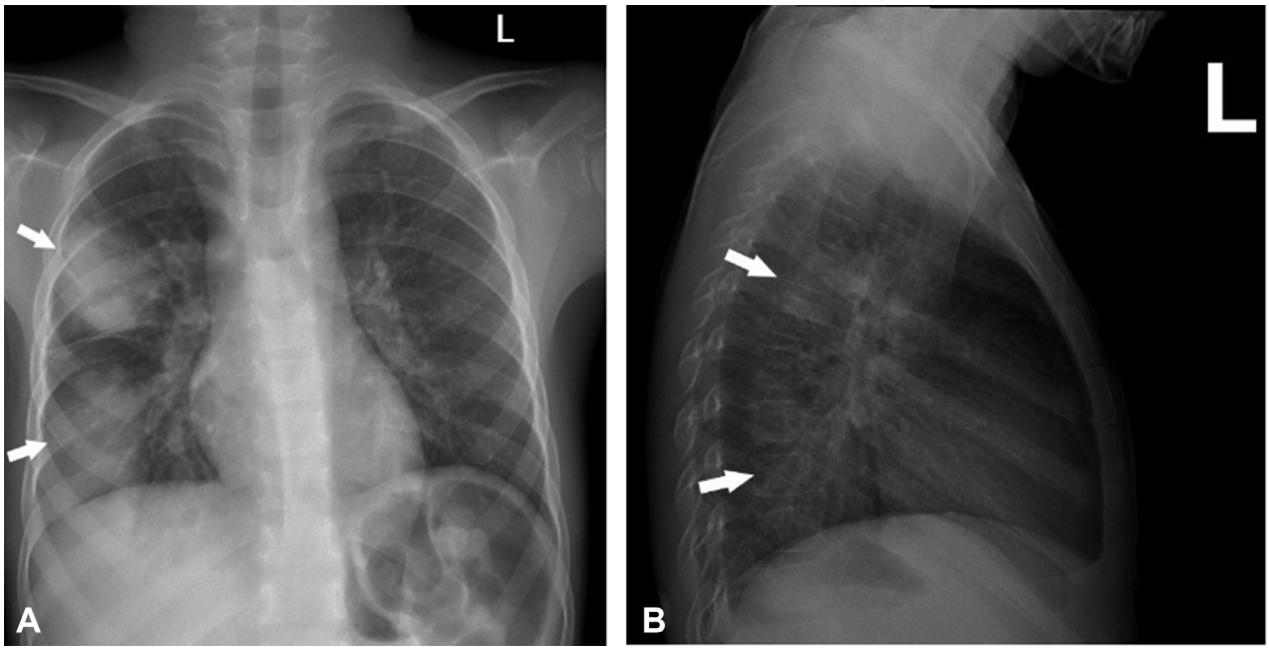


**Fig. 1 – A (Frontal) and B (Lateral) chest x-rays at presentation: demonstrate 2 round pneumonic infiltrations in right lung upper and lower lobes (arrows).**

sick patient. She had received all recommended vaccinations, which had been provided by the National Vaccine Program.

On physical examination, her height was 134 cm and on the 25th percentile, and her weight was 27 kg, which would put her between the 10th and 25th percentile according to CDC growth charts. She was febrile with a temperature of 38.5°C, pulse rate of 98 beats per minute, and blood pressure of 102/58 mmHg. She was mildly distressed with a respiratory rate of 24 breaths per minute. She had intact tympanic membranes with a mildly injected throat and bilateral small, soft submandibular lymph nodes, along with decreased air entry over the right lower zone with bronchial breathing. We obtained a 2-view chest X-ray (CXR) anteroposterior and lateral at presentation, which showed 2 well demarcated homogeneous lesions in the right upper and lower lobes, compatible with round pneumonia (Figs. 1A and B). Laboratory investigations revealed normal peripheral blood count, serum electrolyte, serum sugar, serum lactate dehydrogenase, serum uric acid, and renal and liver functions tests. Serum anti-Mycoplasma pneumoniae antibodies were non-reactive, a rapid urinary antigen test for Streptococcus pneumoniae was positive, and the blood cultures were negative. A tuberculin test was negative. The patient was managed with intravenous penicillin and gentamicin for 3 days, then discharged with oral amoxicillin for another 7 days with complete resolution of her symptoms. Her follow-up CXR showed resolving round opacities with complete resolution after 6 weeks (Figs. 2, 3A and B).

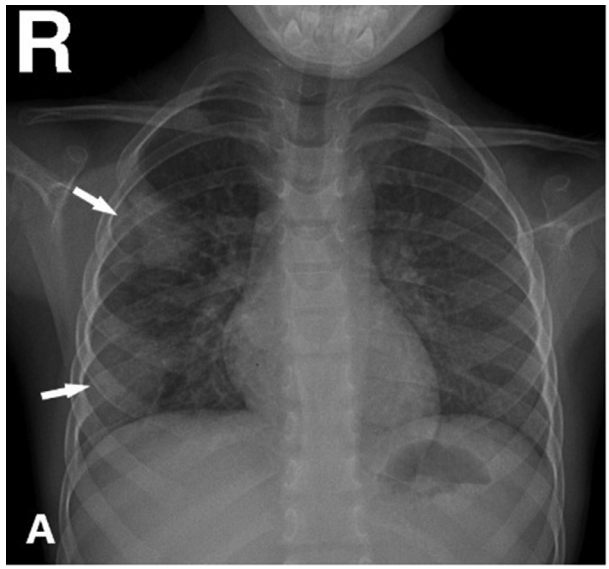


**Fig. 2 – Frontal chest x-rays after 2 weeks: demonstrates resolving round pneumonia in right lung upper and lower lobes (arrows).**

## Discussion

Round pneumonia is a type of pneumonia that presents mainly in young pediatric populations, with a mean age at presentation of 5 years [1,2]. This is most likely caused by underdeveloped collateral airways and inter-alveolar communications (pores of Kohn and canals of Lambert) that may allow the dissemination of fluid or bacteria between the lung subsegments [3]. In a study of 109 pediatric patients with round pneumonia, (>90%) had solitary consolidations, (70%) had well defined borders, and (83%) had consolidations that were located posteriorly and more in the lower lobes bilaterally [2].

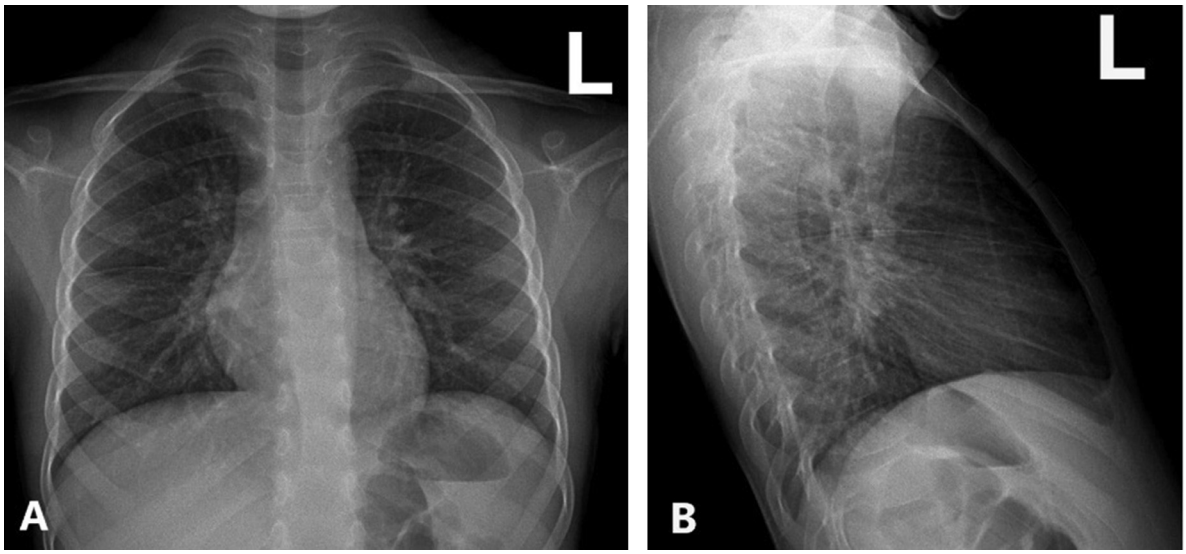


**Fig. 3 – A (Frontal) and B (Lateral) chest x-rays after 6 weeks: demonstrate resolution of round pneumonia in right lung.**

In our case, the age of the patient was slightly older than the ones reported in the literature, and there were 2 initial foci of infection in the right upper and lower lobes that spreads centrifugally through the bronchi, as the inter-alveolar communications (pores of Kohn and canals of Lambert) are not well developed at this age (Figs. 1A and B). The diagnosis of round pneumonia should be kept in mind when treating any child who presents with symptoms of lower respiratory tract infection and round opacities in their chest radiographic imaging. In pediatric populations, pneumonia is a common cause of "round lesions" when compared to non-infectious causes such as neoplasm. Round pneumonia in pediatric populations is a benign lesion, usually resolved with a course of antibiotics, and often does not require advanced chest imaging [4]. Advanced chest imaging should be considered for round opacities if the symptoms do not resolve after a course of antibiotics or if clinical presentation is not consistent with pneumonia [1]. S. pneumoniae is the most common cause of round pneumonia [5]. In our patient, the urinary antigen test was positive for S. pneumoniae, but the blood cultures were negative.

The differential diagnosis of radiographic round opacity in pediatric populations includes congenital pulmonary malformations, diaphragmatic hernias, and neoplasms [1]. In our patient, the likelihood of malignancy was low because the uric acid, lactate dehydrogenase, liver function tests, and peripheral blood smear were all within normal limits.

The treatment of patients with round pneumonia is similar to that of those with lobar pneumonia [6]. Our patient was treated with a combination of intravenous penicillin and gentamicin for 3 days, then discharged with oral amoxicillin for another 7 days with complete resolution of her symptoms. Her follow-up CXR confirmed complete resolution (Figs. 3A and B). The diagnosis of round pneumonia was confirmed when the patient showed complete resolution clinically and radiographically after a course of antibiotics. Advanced chest imaging was not indicated.

## Conclusion

We presented a case of round pneumonia in a 10-year-old girl with an S. pneumoniae infection, and we saw a complete resolution of her clinical and radiological findings after a course of antibiotics. Recent recommendations in the literature suggest that treatment of round pneumonia is similar to that of lobar pneumonia, as both should be treated with antibiotics. Follow-up CXR should be considered in a patient with round pneumonia after several weeks to ensure opacity resolution. Advanced chest imaging is not indicated if the patient shows complete clinical and radiographic resolution. In patients with atypical clinical presentation or poor response to treatment, congenital malformations, lung abscesses, tuberculosis, fungal infections, or neoplasms should be kept in mind.

## Patient consent

The patient's parents have provided permission to publish these features of their daughter case, and the identity of the patient has been protected.

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