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CE - MEDICAL ILLUSTRATION

Unusual radiographic presentation of pneumonia in adults with chronic kidney disease

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A 44-year-old woman with a medical history of systemic arterial hypertension, type 2 diabetes mellitus and stage 3 chronic kidney disease, was admitted to the Emergency Department (ED) with complaints of asthenia, adynamia, dyspnea and orthopnea. On initial examination, blood pressure was 140/100 mmHg, pulse rate 92 bpm, a respiratory frequency of 24 bpm, a temperature of 37.9 °C (100.2 °F), and an oxygen saturation 88% at room air. The physical examination was remarkable for a decrease in breath sounds and medium crackles with predominance in both bases of the lung. The laboratory tests reported a Hemoglobin of 9.37 g/dL, white blood cells of 11,800 CC^3 with neutrophilia of 9700 CC^3, serum glucose of 140 mg/dL, creatinine of 3 mg/dL, blood urea nitrogen of 75 mg/dL, and an elevated C reactive protein (15.4 mg/dL). A chest X-ray study was made, and it was reported that there was a round opacity with an air bronchogram in the superior lobe of the left lung with measurements of 8.6 cm × 5.6 cm. Additionally, there was an image compatible with bilateral pleural effusions and a radio lucid area localized in the apex of the left lung compatible with a pneumothorax (Fig. 1a). Because of this, we decided to perform a thorax computed tomography (thorax CT) that eliminated the possibility of a pneumothorax in the left lung apex (Fig. 1b). We started empirical therapy with ceftriaxone 2 g per day and clarithromycin 1000 mg per day with clinical improvement, and a room air saturation 95% at the 7th day of treatment. Gram's stain and sputum culture were negative, and the patient was discharged after 7 days of hospital stay.

Round pneumonia is defined as a round or oval opacity seen in the chest X-ray study. It is a well-known radiographic presentation of pneumonia in the pediatric population, but it is unusual in adults (around 1%) [1]. It may be seen as a solitary pulmonary nodule or mass, most of them are small and solitary opacities but they can be larger or multiple. This radiographic presentation is thought to appear in an early stage of the infection; when the exudate is transported by interalveolar channels in a non-segmental distribution as the infection advances and the opacity is spread in a centrifugal way before showing the usual lobe opacity. Clinical symptoms are usually mild, nonspecific, and usually last for 1–2 weeks before the patient looks for medical advice [2].

The usual bacteriological agent is *Streptococcus pneumoniae*, followed by *Haemophilus influenzae*, Q fever and *Legionella micdadei*, but in 75% of the cases in adult population, there is no causal agent identified [3]. It is recommended to initiate empirical antibiotic therapy just as with an acquired community pneumonia, and do a follow of the patient in 2–4 weeks taking another chest X-ray study to verify the resolution of the opacity before doing further diagnostic tests if the clinical presentation is compatible with a community acquired pneumonia [4]. The importance of this radiographic presentation in everyday practice is the differential diagnosis with a primary lung neoplasia to avoid unnecessary and expensive diagnostic tests [5]. In our review of the literature and to the best of our knowledge, there are no other reports of a round pneumonia of the

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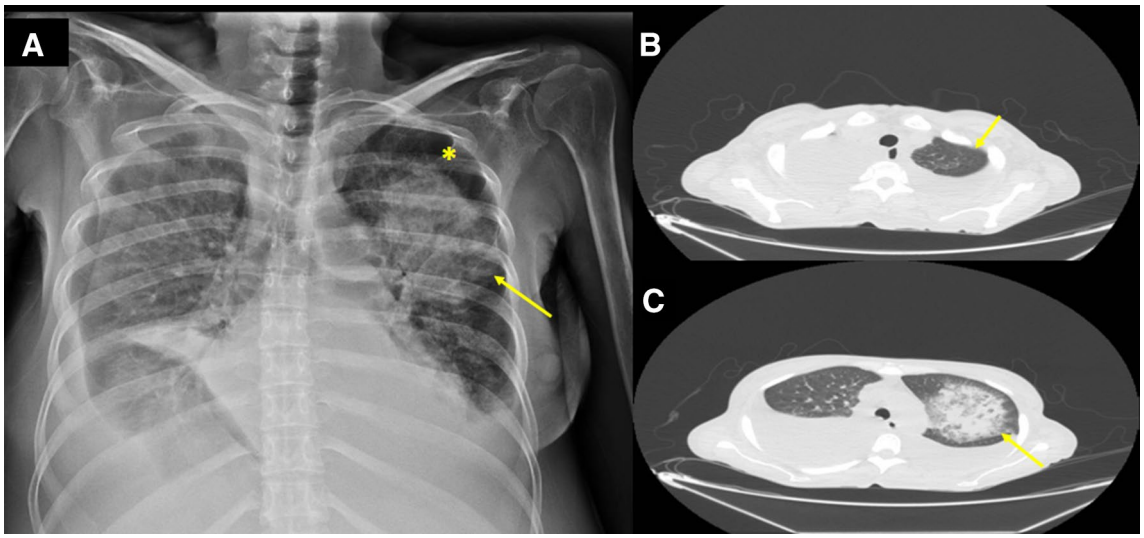

Fig. 1 **a** Chest X-ray at admission shows a round opacity with air bronchogram localized in the superior lobe of the left lung with dimensions of 8.6 cm × 5.6 cm (the yellow arrow indicates the opacity) and a lucent gas space localized in the apex of the left lung (image compatible with a pneumothorax and represented with a yellow asterisk). **b** Thorax CT scan that eliminate a pneumothorax in the left lung apex (no air can be identified in the pleural space indicated by a yellow arrow). **c** Yellow arrow showing the round opacity on the thorax CT scan

dimensions reported above in patients with chronic kidney disease.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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Informed consent Informed consent was obtained from the patient.

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