

# Reversed halo sign in cryptogenic organising pneumonia

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## DESCRIPTION

A 60-year-old woman on no medication, with no obvious exposures and no extrapulmonary symptoms, was referred to diagnostic evaluation due to recurrent pneumonia-like episodes for 6 months. Broad biochemistry, autoimmunology and a body plethysmography were normal. Repeatable chest X-rays found diffuse migratory opacities of pneumonic appearance with mild fluor-18-deoxyglucose metabolic activity on a positron emission tomography scan. Bronchoalveolar lavage fluid revealed lymphocytosis of 57% with a CD4/CD8 ratio of 1.0, but with no signs of infection and no eosinophilia. Transbronchial biopsies were with unspecific inflammation. On suspicion of a hypersensitivity pneumonitis, a supplemental high-resolution CT was performed, which revealed an annular consolidation with central ground glass opacity, the so-called Atoll or reversed halo sign (RHS) (figure 1A, B).<sup>1–3</sup> Histopathological RHS represents a reaction pattern consisting of alveolar inflammation with peripheral fibrin precipitation and formation of granulation tissue, which is a hallmark of cryptogenic organising pneumonia (COP).<sup>4</sup> COP can occur secondary to drug reactions, bacterial and opportunistic infections including fungal infection, sarcoidosis and granulomatosis with polyangiitis, or as idiopathic COP when no apparent aetiology is found.<sup>5</sup> In this case, the latter was interpreted as the most likely cause during a multidisciplinary

team conference. On systemic steroid the patient improved clinically and the radiographic findings remitted fully in 4 months.

## Learning points

- ▶ Reversed halo sign or the Atoll sign on thoracic imaging can be pathognomonic with idiopathic cryptogenic organising pneumonia (COP), but can also be associated with infections, neoplasms and conditions including granulomatosis.
- ▶ On high-resolution CT, the reversed halo sign presents with an annular consolidation and central ground glass opacity.
- ▶ Findings of reversed halo sign and COP may lead to further examination of the underlying cause of its presence, as COP may have multiple aetiologies.

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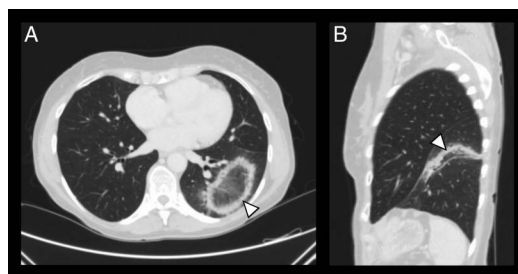
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**Figure 1** (A) Axial high-resolution CT image showing a characteristic reverse halo sign in the left lower lobe, with an annular consolidation and central presence of ground glass opacity. (B) Sagittal high-resolution CT image. The reversed halo sign in image A in this plane is present as a long-shaped opacity.



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