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## Reversed halo sign in pulmonary zygomycosis

We read with interest the article ‘The atoll sign’ by Walsh and Robertson<sup>1</sup> in the November issue of *Thorax*. The authors report a case of cryptogenic organising pneumonia with the atoll sign, also called the reversed halo sign. As mentioned by the authors, this CT sign was first described in

cryptogenic organising pneumonia and was initially considered to be specific for this disease.<sup>2</sup> It was subsequently reported in a variety of pulmonary diseases, including paracoccidioidomycosis (South American blastomycosis), tuberculosis, pulmonary sarcoidosis, lymphomatoid granulomatosis, Wegener’s granulomatosis, lipoid pneumonia and pneumococcal pneumonia.<sup>3–5</sup>

We would like to highlight another important cause of the reversed halo sign: invasive pulmonary fungal infections, particularly pulmonary zygomycosis (PZ) (figure 1). In immunosuppressed patients, the presence of the reversed halo sign on CT should be considered as invasive fungal disease until proven otherwise. It is an early sign that is more frequently seen in patients with PZ than invasive pulmonary aspergillosis (IPA).<sup>6</sup>

Early institution of high-dose antifungal therapy is associated with improved outcomes; therefore, early recognition of invasive fungal disease is important. Moreover, because the therapy for presumed fungal pneumonia in this population is often aimed at IPA due to its higher incidence and the preferred antifungal agent for IPA is voriconazole, which is not effective against PZ, it is important to differentiate between the two entities. The presence of the reversed halo sign can be used to optimise antifungal therapy to cover PZ.

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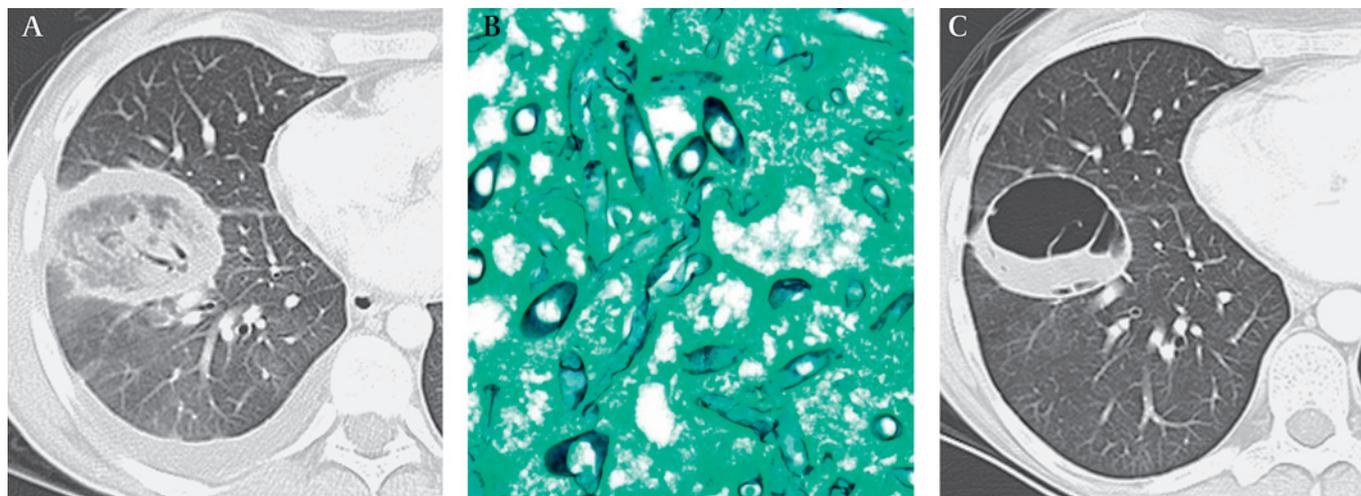
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## Serum 25-hydroxy vitamin D and exercise capacity in COPD

Janssens and colleagues<sup>1</sup> have recently reported that vitamin D deficiency is very common in patients affected by chronic obstructive pulmonary disease (COPD) and that vitamin D status correlates with lung function. In the same issue of *Thorax*, Quint and Wedzicha<sup>2</sup> discuss potential effects of vitamin D deficiency and supplementation



**Figure 1** Pulmonary zygomycosis in a 24-year-old woman undergoing chemotherapy for recurrence of acute myelogenous leukaemia, 1 year following allogeneic stem cell transplantation, with a 2-week history of fever and dry cough. (A) Chest CT shows a focal round area of ground-glass attenuation surrounded by a ring of consolidation in the right lower lobe, consistent with the reversed halo sign. (B) Photomicrograph of the specimen from a transthoracic biopsy of the lesion shows pauciseptated hyphae with non-parallel walls and 90° branching, characteristic of *Zygomycetes* species, which is confirmed by culture. (C) One-month follow-up CT shows cavitation of the lesion, which eventually resolved under antifungal therapy.