Another Cause of the CT Target Sign: Influenza A (H1N1) Pneumonia

From:

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To the Editor:

We read with interest the well-written Letter to the Editor by Jafari et al. (1), who presented the chest computed tomography (CT) findings of four patients with confirmed COVID-19 pneumonia. The scans showed lesions characterized by the circular appearance of uninvolved pulmonary parenchyma, each with a central hyperdense dot, surrounded by ground-glass opacities. The authors called this pattern the "pulmonary target" appearance.

A series of nearly simultaneous studies (2–6) described a similar CT pattern observed in patients with COVID-19, consisting of central nodular opacity surrounded by ground-glass attenuation and a dense peripheral rim. The authors refer to this sign variably as the target sign (2,4), double halo sign (3), "bulls-eye" sign (5), and "rings of Saturn" appearance (6). More important than the denomination is the recognition of the signs' common etiopathogenesis; all of these signs likely have the same significance and represent organizing pneumonia (7).

Careful analysis of tomographic features observed in patients with COVID-19 pneumonia presenting the target sign shows that the sign basically corresponds to a central nodular opacity of variable density (soft tissue or ground-glass opacity), surrounded by a less-dense peripheral ring, with normal parenchyma or ground-glass attenuation, and a new, denser, peripheral ring, with soft-tissue density or ground-glass attenuation. In some cases, additional concentric layers are observed (8).

Jaferi et al. (1) reported that this tomographic finding is unique and specific to COVID-19 pneumonia, and argued that it can be used to distinguish COVID-19 pneumonia from similar viral pneumonias, as it had not, to their knowledge, been reported in other lung diseases. They also commented that this appearance is consistent with the pathological findings of organizing pneumonia. Other authors (9) have similarly noted that the target sign has not been described previously in association with other viral or bacterial respiratory infections, and thus could be a hallmark of COVID-19 pneumonia in the appropriate clinical context.

However, a retrospective review of CT scans of patients admitted to our institution with H1N1 pneumonia in 2010 brought to our attention the case of a 65-year-old woman who presented with a typical target sign on chest CT. The
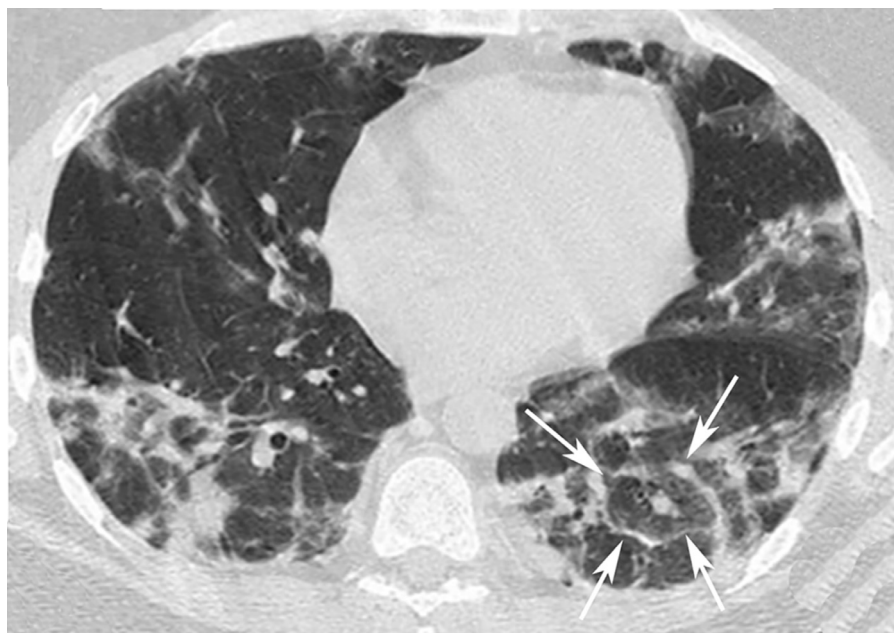
Fig 1. Images from a 65-year-old woman with confirmed influenza A (H1N1) pneumonia. (a) Axial chest computed tomography showed perilobular opacities in both lower lobes, and a target sign in the left lobe (arrows). (b) A photomicrograph shows typical fibroblast plugs filling airspaces (original magnification, 10 ×; hematoxylin and eosin stain). (Color version of figure is available online.)
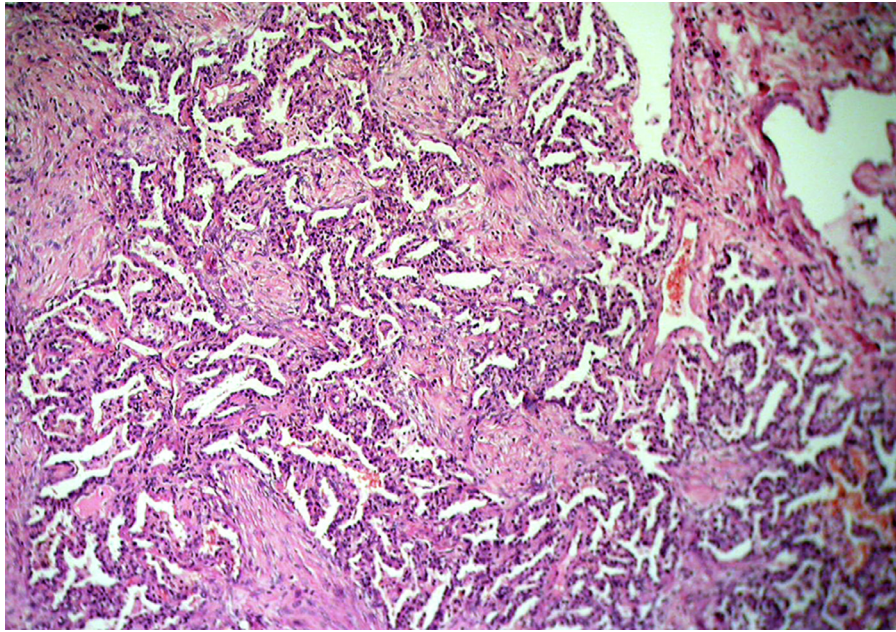
Fig 1 Continued.

patient was admitted to the Emergency Department with a 6–day history of fever, headache, myalgia, and dry cough. The diagnosis of influenza A (H1N1) virus infection was confirmed by real-time polymerase chain reaction. CT performed 4 hours after admission showed diffuse consolidations and ground–glass opacities, predominating in the lower lung areas. Three weeks after admission, the patient maintained dyspnea, and a new CT scan showed extensive opacities in the lower lobes, in addition to a lesion with the target sign appearance in the left lower lobe (Fig 1a). The patient evolved with arrhythmia and died. A necropsy showed that the target lesion corresponded to organizing pneumonia (Fig 1bB). Thus, the target sign is not specific to COVID–19 pneumonia, and may also be seen in patients with influenza A (H1N1) pneumonia.

PRIOR PRESENTATIONS

No.

AUTHOR CONTRIBUTION

LFN and BH have provided the case and images and EM and GZ have written the article.

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