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Pulmonary Target Sign: A New Finding or a Neglected Feature?

From:

Amin Saburi, Patrick M. Colletti, Ramezan Jafari

From the Chemical Injuries Research Center, Systems Biology and Poisonings Institute, Baqiyatallah University of Medical Sciences, Mollasadra St, Vanak Sq, Tehran, Iran (A.S.); Department of Radiology, Keck School of Medicine of USC, Los Angeles, CA (P.M.C.); Department of Radiology, Faculty of Medicine, Baqiyatallah University of Medical Sciences, Tehran, Iran (R.J.).

Dear Editor

In reply to a letter to the editor entitled “Another Cause of the CT Target Sign: Influenza A (H1N1) Pneumonia” which is based on our previous article about Pulmonary Target Sign (PTS) in COVID19 (1), we would like to mention a few points that seem useful

PTS is a newly described sign of pulmonary involvement of SARS-Cov2 and few cases of this feature were published. Radiologists have not yet confirmed its specificity and diagnostic value, which is due to the small number of reported cases. It is still doubtful whether PTS and similar findings including the “bull’s eye” sign and “Rings of Saturn,” a derivative of the halo sign, or are independent of it. Although this feature has not been reported previously, it is also debatable whether it is diagnostic and characteristic of COVID-19 or only suggestive. What is important now is that this feature may be helpful in the diagnosis in SARS-Cov2 patients, although it has not been reported in previous studies on other viral lung infections, where it may have been misdiagnosed! (Fig 1)



Figure 1. CT in a 41-year-old man with PCR positive COVID-19 demonstrates a typical peripheral pulmonary target sign (arrow) with a prominent adjacent broncho-vascular bundle and peripheral and nearby ground glass opacities.

After reviewing more than 11,000 proven cases of COVID-19 in a tertiary university hospital during more than 9 months, we found more than 30 cases of PTS where its common imaging characteristics are: multiple, pleural based, peripheral in location, associated with broncho-vascular bundles and adjacent to peripheral ground glass opacities (Unpublished data).

We believe that PTS in COVID-19 is more common than expected because; (1) it may still be unfamiliar to radiologists as we saw it in previous published papers where it was not mentioned (2,3), (2) it may be mistaken for the atoll sign (difference is the central part; dense dot vs. central ground glass opacities) (4,5), (3) many pictorial derivatives such as double or incomplete outer dense rings may be seen (6), and (4) its possible confusion with organizing pneumonia which pathophysiologically makes this appearance possible in the early stages of the disease (7,8). At the early stage of COVID-19 when solitary lobule and its central bronchiole and artery become inflamed and fibrin and secretions began to fill the alveoli, PTS may be initially visible.

We have some recommendations for future study:

1. Retrospectively or prospectively assess other viral pneumonias, especially from the corona virus family (e.g., MERS, SARS-Cov1, HINI, . . .) for PTS,
2. Assess pathologic findings of “Reverse Halo” lesions and PTS in these viral pneumonia and organizing pneumonia cases,
3. Compare serial HRCT of SARS-COV2 cases for PTS and the Reverse Halo sign and follow these features in a timeline. Ideally, an international committee of radiologists may be formed to evaluate these new CT features in SARS, COVID-19, and other epidemic infections.

Sincerely,

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