Trauma Monthly

Original Article

Target Sign, Owl Eyes, and Concentric Semicircles View in Patients with Covid-19 from Three Provinces in Iran: A Case Series Study

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Abstract

The new coronavirus disease, which started in Wuhan, quickly transformed into a pandemic and a life-threatening global infection. Understanding Covid-19-specific views can facilitate defining more accurate CT scan diagnostic criteria for this disease. These views include ground-glass opacity (GGO), consolidation, interlobular septal thickening, reticular, and crazy paving. This case series aimed to assess six Covid-19 patients displaying the target sign view in lung CT scans.

Keywords: Sedimentation sign, Lumbar spinal stenosis, Low back pain.

Introduction

The new coronavirus disease, which started in Wuhan, quickly transformed into a pandemic and a life-threatening global disease. One of the most important diagnostic methods for this disease in the phase of respiratory problems is the CT scan view [1]. There are different lung CT scan views for this disease in various studies. These views include GGO, consolidation, interlobular septal thickening, reticular, and crazy paving[2].

GGO is characterized by increased density in some areas, which may indicate bronchial thickening. On the other hand, consolidation shows that alveoli are filled with fluids or pus[3]. Crazy paving is characterized by an increase in the thickness of the interlobular septum, in which the lobule itself has a ground glass view in the background [4]. Some review studies have mentioned uncommon views for Covid-19, such as vascular enlargement and sub pleural curvilinear line [3-5].

Müller et al. recently have reported a target sign view in the chest CT scan of two patients with confirmed Covid-19 diagnosis[1]. The target sign view recently recognized on a chest CT scan by Müller et al.[1] is defined as a nodular opacity in the center of a ring-like opacity in patients with acute respiratory syndrome related to the SARS-Cov-2 virus. This view has been significantly associated with the Covid-19 disease [6-8], showing distinct vascular features characterized by endothelial damage with the disrupted cell membrane (endothelialitis), disseminated thrombosis with microangiopathy, angiocentric inflammation in lung autopsy[9]. This case series aimed to introduce six Covid-19 patients displaying the target sign view in lung CT scans.

Case presentation

Case 1

A 30-year-old man with a history of allergies, especially in winter, presented with cough, fever, and a positive PCR test for Covid-19. At admission to the Covid-19 center in Arak, vital signs were stable without reduced O2 saturation or persistent

fever, and received supportive treatments. After about two weeks, symptoms improved, and the PCR test became negative. In lung CT scan at admission to the emergency department of our Covid-19 care center, ground-glass opacities with less than 25% lung involvement (severity score of 2) were observed in the lungs' periphery. In some peripheral opacities in LUL and RLL, the target view was seen as a dense opacity in the periphery with central density (Fig. 1).

Case 2

A 50-year-old man in Karaj presented with a history of cough and fatigue, especially in the lower extremities. There was no history of chronic disease. Tachycardia and mild tachypnea, and normal blood pressure were observed in the clinical examination. While receiving supportive treatment, no evidence of hypoxia or disease progression was found. After 35 days from the onset of the disease, symptoms resolved, and PCR rendered negative results.

In the CT scan performed upon admission to the center, multi-lobular GGO opacities were seen in the peripheral areas of both lungs, some of which had a targeted view, with less than 5% lung involvement (severity score of -1) (Fig. 2).

Case 3

A 65-year-old man in Karaj with a history of End-stage renal disease and evidence of dyspnea and drop in O2 saturation presented to our center. Regarding the severity of symptoms, he was hospitalized and underwent non-specific antiviral therapy, supportive treatments, and oxygen therapy. After around two weeks, he was discharged with a good general condition.

Multi-lobular peripheral ground-glass opacities were seen in both lungs in the CT scan in the admission phase. Some of which were seen as two concentric semicircles. Lung involvement was less than 5% (severity score of -1) (Fig. 3).

Case 4

A 25-year-old man was indicated evidence of dyspnea and loss of taste. He did report no history of any specific disease. In clinical examination at covid-19 center in Karaj, tachypnea and mild tachycardia with normal blood pressure were observed. No drop in oxygen saturation was seen. The patient recovered following outpatient supportive treatment and home quarantine.

In the lung CT scan performed upon referral to Covid-19 center, peribronchovascular and peripheral multi-lobular dense opacities were seen in RML, RUL, RLL, and LLL. Lung involvement was less than 5% (severity score of 1-) (Fig. 4)

Case 5

A 43-year-old Afghan man was referred to Covid-19 center in Karaj with fever, chills, and myalgia. He did not report any history of a specific disease or smoking. Upon arrival, he had mild tachypnea and no cough or sputum. O2 saturation was typical, and the patient received outpatient supportive treatment.

In the lung CT scan performed upon admission, multiple peripheral opacities with target view were seen in both lungs. Pulmonary parenchymal involvement was between 5 and 25% (severity score of 2) (Fig. 5).

Case 6

A 26-year-old man was indicated evidence of dyspnea. In clinical examination at covid-19 center in borujerd, tachypnea and normal blood pressure were observed. No drop in oxygen saturation was

seen. The patient recovered following outpatient supportive treatment and home quarantine.

In the lung CT scan performed upon admission, multiple peripheral opacities with target and owl eye view were seen in both lungs. Pulmonary parenchymal involvement was between 5 and 25% (severity score of 2) (Fig. 6).
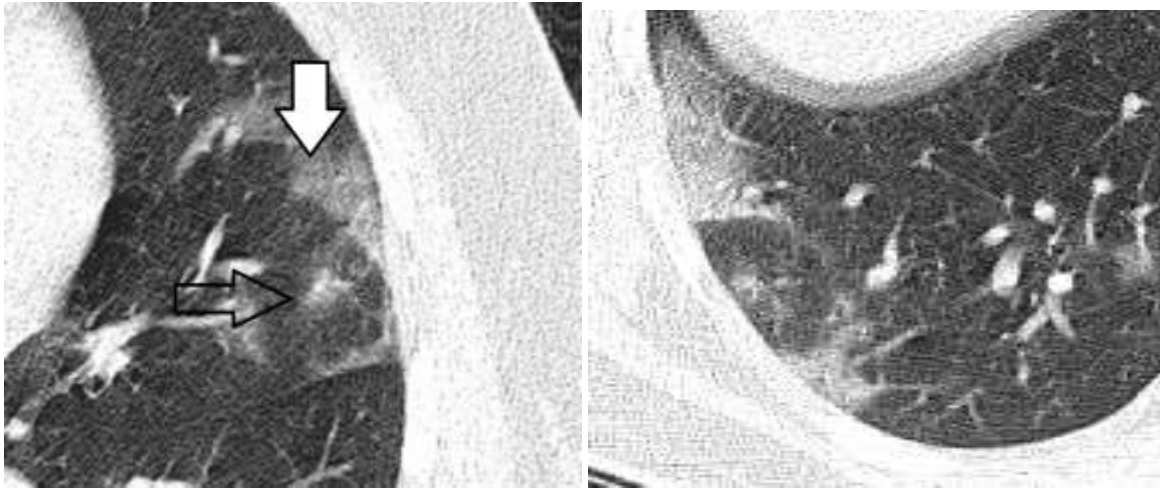

Figure 1. Multi-lobular peripheral ground glass opacity with target view in both lungs

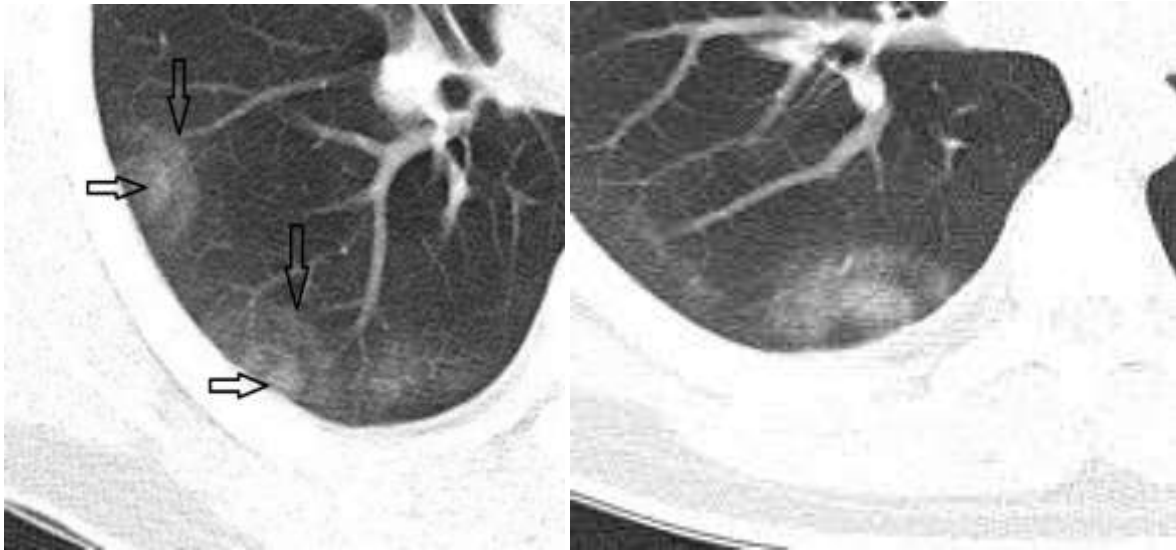Figure 2. Peripheral ground glass opacities with target view in axial lung CT scan

Figure 3. Peripheral ground glass opacities with two concentric semicircles in the axial view of lung CT scan
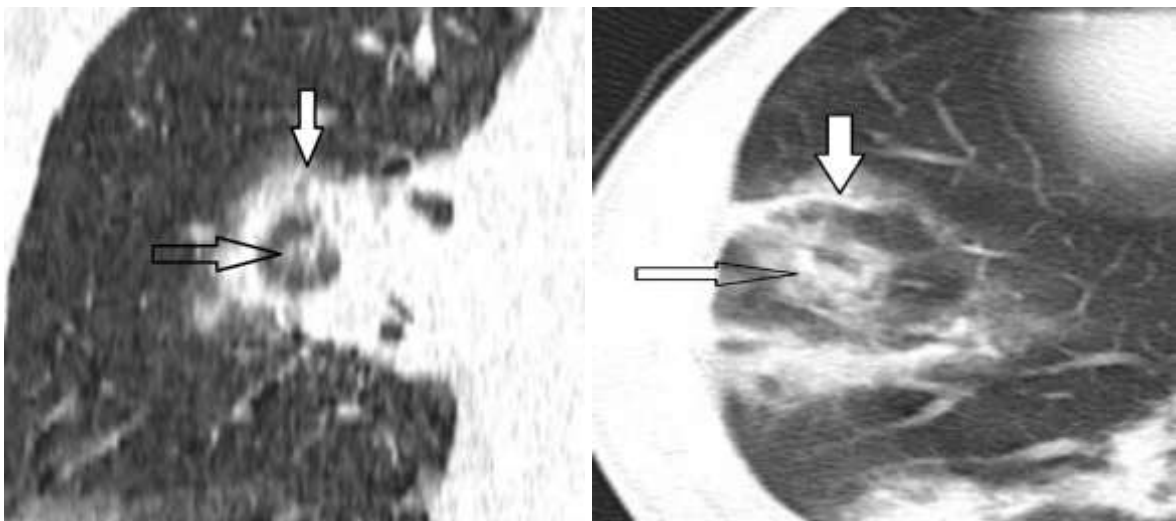

Figure 4. Multi-lobular dense central and peripheral opacities with target view in both lungs (left: coronal cut, right: axial cut).
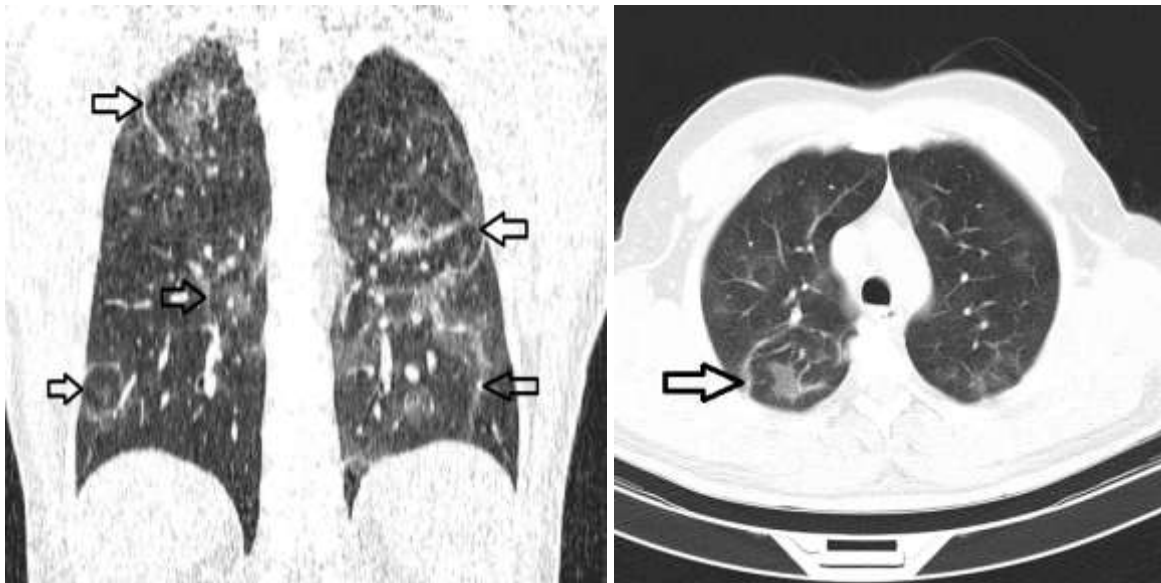
Figure 5. Multiple multi-lobular opacities with target view in both lungs (left: coronal cut, right: axial cut).
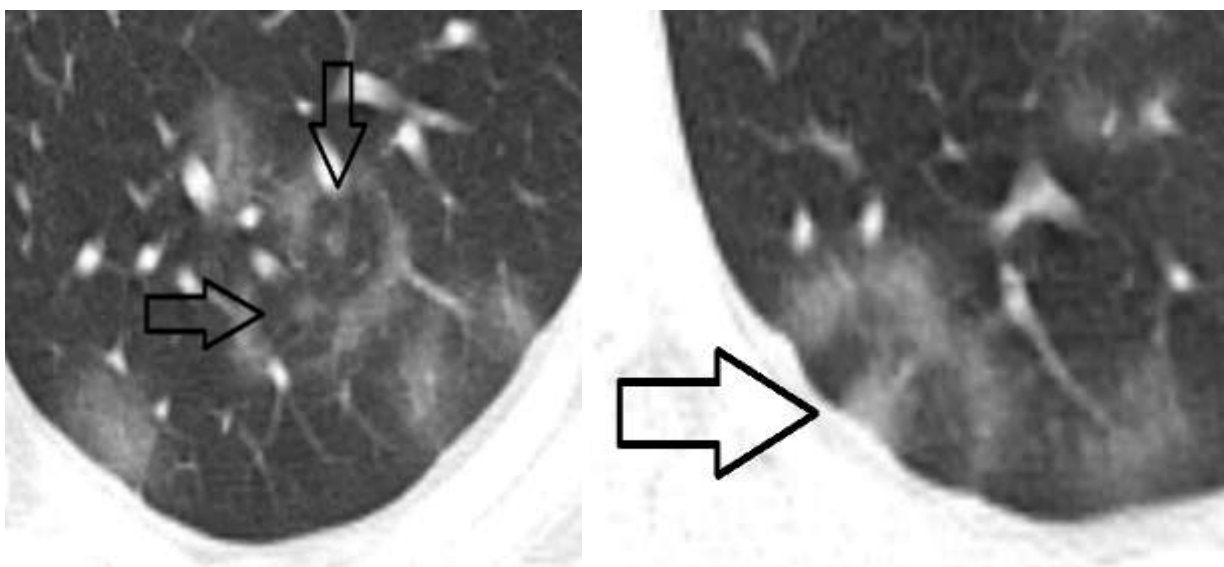

Figure 6. Peripheral ground glass opacities with target and owl eye view in axial lung CT scan

Discussion

No definitive treatment has yet been introduced for Covid-19 disease. Different studies have mentioned Ramsedivir, Favipiravir, and corticosteroids for treating moderate to severe Covid-19 disease [10]. Since early detection and the quarantine of Covid-19 patients are among the best measures that health systems can employ to curb disease spread, performing lung CT scans and reporting characteristic findings in these patients are necessary. In this regard, knowing uncommon CT appearances is very important to identify patients with atypical results in early phases and quarantine them [2].

In addition to common CT scan findings including GGO, interlobular septal thickening, and reticular patterns, less common CT appearances such as target view should also be considered [2]. Understanding Covid-19-specific views can facilitate defining more accurate CT scan diagnostic criteria for this disease.

Conclusion

The new coronavirus disease, which started in

Wuhan, quickly transformed into a pandemic and a life-threatening global infection. Understanding Covid-19-specific views can facilitate defining more accurate CT scan diagnostic criteria for this disease. These views include ground-glass opacity (GGO), consolidation, interlobular septal thickening, reticular, and crazy paving. This case series aimed to assess six Covid-19 patients displaying the target sign view in lung CT scans.

Acknowledgments

None

Conflict of Interest Disclosures

The authors declared no potential conflict of interests.

Funding Sources

None.

Authors' Contributions

All authors contributed equally in this study.

Ethical Statement

All patients confirmed consent form.

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