

COVID-19 pneumonia in a Turkish child presenting with abdominal complaints and reversed halo sign on thorax CT

Süreyya Burcu Görkem 
Benhur Şirvan Çetin 

From the Department of Radiology, Division of Pediatric Radiology (S.B.G. ✉ drburcuogorkem@gmail.com) and Department of Pediatric Infectious Diseases (B.Ş.Ç.), Erciyes University School of Medicine, Kayseri, Turkey.

Dear Editor,

We have read the recent letters in *Diagnostic and Interventional Radiology* describing coronavirus disease 2019 (COVID-19) pneumonia in a child as a result of familial spread (1) and the “reversed halo sign” observed on thorax computed tomography (CT) (2). We would like to share our experience on both topics recognized in a child presenting with abdominal complaints.

A 15-year-old girl presented with a 4-day history of right lower quadrant abdominal pain and vomiting to the pediatric emergency department. Her mother was hospitalized with COVID-19 pneumonia two days ago. Physical examination showed only an epigastric tenderness. She had no fever, no cough. Laboratory tests revealed total white blood cell count $4.01 \times 10^3/\mu\text{L}$, lymphocyte count $1.92 \times 10^3/\mu\text{L}$, C-reactive protein (CRP) 1.6 mg/L, aspartate transaminase 57 U/L, alanine transaminase 68 U/L, and normal levels of serum amylase, bilirubin, and D-dimer. Abdominal ultrasound was performed to exclude any acute abdominal etiology. The abdominal organs were normal; however, the appendix could not be visualized due to bowel gas obscuration. On contrast-enhanced abdominal CT examination, there was no evidence of acute abdominal etiology except bilateral patchy alveolar infiltrations in both basal segments of the lung. The patient underwent an unenhanced low-dose thorax CT with presumed diagnosis of

COVID-19 pneumonia. Thorax CT showed multifocal “reversed halo sign” within the bilateral upper, middle and lower lobes. In the center of the halo there was a centrilobular “dot-like” nodule (Fig.). Bilateral parahilar-peribronchial wall thickening, multiple multi-segmental, peripherally located patchy alveolar infiltrations, and scattered ground-glass opacities (GGOs) within the upper, middle, and lower lobes were shown (Fig.). Bilateral subcentrimetric hilar, mediastinal and axillary lymphadenopathies were also noted. Reverse transcription polymerase chain reaction (RT-PCR) of the first nasopharyngeal swab was negative for SARS-CoV-2. One day later, the second swap test came back positive and diagnosis of COVID-19 was confirmed. She was hospitalized and treated with hydroxychloroquine for 5 days. Antacid therapy relieved the abdominal pain. CRP levels gradually increased to 10.9 mg/L on her fifth day without any respiratory or abdominal symptoms, or other abnormal laboratory findings. During hospitalization, oxygen saturation in room air was never below 95%. She was discharged without any symptoms on the eighth day of her admission and followed-up for 14 days of quarantine at home.

Bilateral peripherally distributed GGOs and patchy alveolar infiltrations with lower lobe predominance are common findings in children (3, 4). The CT findings of our case differed from the COVID-19 positive children in the literature with the evidence of the reversed halo sign. Reversed halo sign is a central GGO surrounded by complete or incomplete crescent-like airspace consolidation. This sign was reported in many critically-ill adult COVID-19 patients in the literature as an indicator of organizing pneumonia or invasive fungal infections in immunocompromised patients or granulomatous diseases such as tuberculosis and sarcoidosis (2). Our case was a child and she had very mild symptoms despite severe CT findings.

We aimed to point out a different clinical and radiological manifestation of a child with COVID-19 pneumonia without any respiratory symptoms. In addition to the GGOs and patchy alveolar infiltrations, the reversed halo sign can also be noted in children with COVID-19 pneumonia on thorax CT. Pediatric radiologists should be aware of this finding while reporting.



Figure. a, b. Axial thorax CT images (a, b) demonstrate multiple multifocal reversed halo sign (white arrows) with a centrilobular dot-like nodule. Multifocal peripherally distributed patchy alveolar infiltrations and ground glass opacities are noted bilaterally (black arrows).

Conflict of interest disclosure

The authors declared no conflicts of interest.

References

1. An P, Zhang M. Novel coronavirus SARS-CoV-2: familial spread resulting in COVID-19 pneumonia in a pediatric patient. *Diagn Interv Radiol* 2020; 26:262–263. [\[Crossref\]](#)
2. Bekci T. "Reversed halo sign" on 3D CT in COVID-19. *Diagn Interv Radiol* 2020. 2020 Apr 30. [Epub ahead of print] [\[Crossref\]](#)
3. Zhong Z, Xie X, Huang W, Zhao W, Yu Q, Liu J. Chest CT findings and clinical features of coronavirus disease 2019 in children. *Zhong Nan Da Xue Xue Bao Yi Xue Ban* 2020; 45:236–242.
4. Lu Y, Wen H, Rong D, Zhou Z, Liu H. Clinical characteristics and radiological features of children infected with the 2019 novel coronavirus. *Clin Radiol* 2020 May 1. [Epub ahead of print] [\[Crossref\]](#)

Received 18 May 2019; revision requested 23 May 2020; last revision received 24 May 2020; accepted 25 May 2020.

Published online 05 June 2020.

DOI 10.5152/dir.2020.20361

You may cite this article as: Gökem SB, Çetin BŞ. COVID-19 pneumonia in a Turkish child presenting with abdominal complaints and reversed halo sign on thorax CT. *Diagn Interv Radiol* 2020; 26:608–609