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Lobar Pneumonia in Covid-19: A Case Report of Two Patients for an Atypical Imaging Pattern

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ABSTRACT

Introduction: Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2. The role of Computed Tomography (CT) of chest and imaging features of this novel disease are well documented, which include bilateral, peripheral, and basal predominant ground-glass opacity, consolidation or both. Although lobar consolidation is considered an atypical finding and is uncommon in COVID-19, it cannot completely exclude the possibility of COVID-19.

Case Detail: Two young female patients presented with clinical features of COVID-19 pneumonia and confirmed by RT-PCR test. Both the patients showed pattern of lobar pneumonia on CT scan. The patients were successfully managed medically and discharged in stable conditions after 2 negative tests.

Conclusion and Take Away Lessons: Although lobar pneumonia is atypical and uncommon in COVID-19, emerging atypical CT manifestations, including lobar consolidation, can be seen in small group of patients and cannot completely exclude the possibility based only on imaging features.

KEYWORDS: COVID-19; Lobar Consolidation; Lobar Pneumonia; CO-RADS; CT Chest

KEY MESSAGES:

1. CO-RADS - "A categorical CT assessment scheme for patients with suspected COVID-19" has assigned lobar pneumonia as CO-RADS 2, that implies a low level of suspicion for pulmonary involvement by COVID-19 based on CT findings in the lungs and is considered not compatible with COVID-19.

- Although lobar pneumonia is atypical and uncommon in COVID-19, emerging atypical CT manifestations, including lobar consolidation, can be seen in small group of patients and cannot completely exclude the possibility based only on imaging features.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. The imaging features of COVID-19 pneumonia are well documented, which include bilateral, peripheral, and basal predominant ground-glass opacity, consolidation or both [2-4]. Certain Computed Tomography (CT) findings in the lungs that are typical of other infectious pathology and not compatible with COVID-19, including lobar pneumonia [5]. Although lobar consolidation is considered an atypical finding and is uncommon in COVID-19, it cannot completely exclude the possibility of COVID-19. We present case series of 2 young female patients who showed pattern of lobar pneumonia and managed successfully.

CASE SUMMARY

Case 1

A 33-years old previously healthy female patient presented in emergency department with history of non-productive cough and fever for 5 days. She had no other symptoms apart from exertional dyspnea for 1 day, and no definite COVID-19 exposure history. The patient was afebrile (98.6-degree F) and pulse was 76 beats/minute. Blood pressure (110/70 mm Hg) and respiratory rate were normal (20/minute). Blood oxygen saturation was 96% on room air. Blood investigations revealed high C- Reactive Protein level (CRP - 91 mg/L) & serum ferritin level (247 mcg/mL) and marginally high D-Dimer (0.84 mcg/mL), Serum Glutamic Pyruvic Transaminase (SGPT - 38 U/L) & Interleukin - 6 (11 pg/mL). The total leucocyte counts were normal (6940/cumm). Blood investigations are summarised in Table 1. CT chest revealed air space opacifications with air bronchogram confined to left lower lobe, suggestive of "Lobar Pneumonia" (Figure 1). Rest of bilateral lung parenchyma was normal. In view of normal total leucocytes count and on-going pandemic of COVID-19 pneumonia, the patient was suspected of COVID-19 pneumonia and hence further microbiological investigation was not warranted. Nucleic acid testing for SARS-CoV-2 was positive on the same day of admission. Blood oxygen saturation was maintained after admission (95% on room air). At the same time, she was started on antibiotics and other supportive treatments (Intravenous Fluid Resuscitation, multivitamins and zinc supplements). She was also given anticoagulant (Enoxaparine - 40 mg/0.4 ml) once daily and low dose steroid (Dexamethasone - 4mg/2ml) twice daily. The patient remained stable throughout the course while admitted in the hospital and discharged after 6 days of admission.

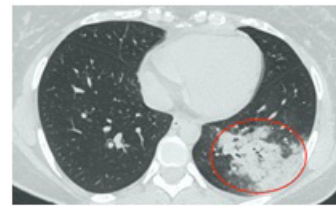


Figure 1a

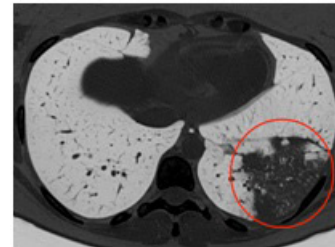


Figure 1b

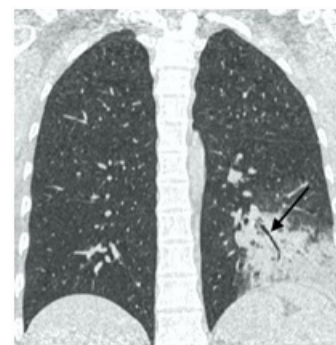


Figure 1c

Figure 1: Axial thin-section unenhanced CT image (Conventional Lung Window – Figure 1a and Inverse image – Figure 1b) of a 33-years-old female patient showed air space opacifications (red circle), and (c) coronal image showed air-bronchogram (black arrow).

Case 2

A 29-year old female trainee physician came with complaints of sore throat, diarrhoea, weakness and body ache since 4 days; fever since 3 days and new onset breathing difficulty following worsening generalized weakness for 1 day. She was afebrile (98-degree F) and pulse rate was 80 beats/minute. Blood pressure (120/80 mm Hg) and respiratory rate were normal (18/minute). Blood oxygen saturation was 98% on room air. Blood investigations were within normal limits and are documented in Table 1. CT chest revealed patchy and confluent air space opacifications with air bronchogram confined to left lower lobe, suggestive of "Lobar Pneumonia" (Figure 2). Rest of bilateral lung parenchyma was normal. The total leucocyte counts were normal (6542/cumm). In view of normal total leucocytes count and on-going pandemic of COVID-19 pneumonia, the patient was suspected of COVID-19 pneumonia and hence further microbiological investigation was not done to rule out bacterial pneumonia. Nucleic acid testing for SARS-CoV-2 was positive. Blood oxygen saturation was maintained after admission (98-99% on room air). She was treated

with azithromycin and hydroxychloroquine and other supportive treatments (Intravenous Fluid Resuscitation, multivitamins and zinc supplements). She was also given Oral Rehydration Solutions and probiotics for diarrhoea. She remained stable throughout the course while admitted in the hospital, and was discharged after 4 days of hospitalization.

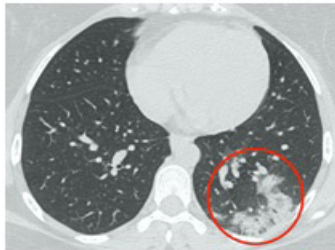


Figure 2a

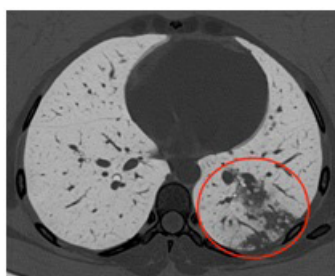


Figure 2b

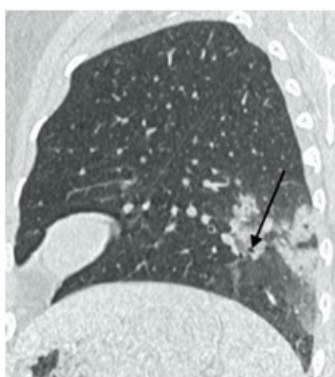


Figure 2c

Figure 2: Axial thin-section unenhanced CT image (Conventional Lung Window –Figure 2a and Inverse image – Figure 2b) of a 29-years-old female patient showed air space opacifications (red circle), and (c) sagittal image showed air-bronchogram (black arrow).

Table 1: - Blood Investigations

Blood Investigations (Normal Range)	Case 1
Total Leukocyte Counts (4000 – 11000 /cumm)	6940
Lymphocyte Counts (20 – 40%)	20
C- Reactive Protein (0 – 5 mg/L)	91
Serum Ferritin (13 – 150 mcg/mL)	247
D-Dimer (< 0.4 mcg/mL)	0.84
Serum Glutamic Pyruvic Transaminase (<34 U/L)	38
Interleukin – 6 (less than 7 pg/mL)	

DISCUSSION

COVID-19 is caused by an enveloped, single stranded positive-sense RNA virus (SARS-CoV-2) [1]. After being detected for the first time in late December 2019, it spread worldwide and reached a pandemic stage in March 2020. Since then, several recent studies have published CT imaging features of COVID-19 pneumonia, the temporal evolution of these features over time, and the performance of radiologists in distinguishing COVID-19 from other viral as well as bacterial infections. COVID-19 often produces a typical CT pattern including bilateral, peripheral, and basal predominant ground glass opacity, consolidation or both [2-5]. There are many similar articles about CT findings on COVID-19 infection which are published by experienced authors from all over the world in the literature [6,7].

Among the reported CT features of COVID-19, lobar consolidation an atypical finding which is considered uncommon or not occurring in COVID-19, as it is more typical in the setting of a bacterial pneumonia [8-10]. The British society of thoracic imaging considers this finding as NON-COVID as it may exclude the possibility of COVID-19 in ~70% of patients [8]. “CO-RADS – A categorical CT assessment scheme for patients with suspected COVID-19” has assigned lobar pneumonia as CO-RADS 2, that implies a low level of suspicion for pulmonary involvement by COVID-19 based on CT findings in the lungs and is considered not compatible with COVID-19 [5].

Although lobar consolidation is an uncommon finding, it may be seen in small group of patients with COVID-19 pneumonia and cannot completely exclude the possibility based only on imaging features. Kashgari A et al. have documented a case of lobar pneumonia in COVID-19 pneumonia in a paediatric patient of 5 years of age [10]. AKÇAY et al. also have reported a case of lobar pneumonia in a 66 years old male patient as an atypical finding [9].

In conclusion, the imaging features of COVID-19 are well documented. However, few atypical features are still emerging and establishing. With the gradual recognition of radiological findings of COVID-19 pneumonia, it is important to be aware of the imaging spectrum of the disease including atypical findings for rapid and correct diagnosis, which may contribute to effective surveillance and management.

RESEARCH QUALITY AND ETHICS STATEMENT

The authors of this manuscript declare that this scientific work complies with reporting quality, formatting and reproducibility guidelines set forth by the EQUATOR Network. The authors also attest that this clinical investigation was not determined to require Institutional Review Board / Ethics Committee review, and the corresponding protocol / approval number is not applicable.

The patients reported in this article had signed a written informed

consent form, in which the patient was informed that they may be subjects of scientific publication and is informed of the ethical codes of conducts.

Consent for publication: Informed written consent was taken from the patients for publication. Availability of data and materials: All data is available based on a reasonable request.

References

1. Chen Y, Liu Q and Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. *J Med Virol.* 2020; 92:418-43. doi:10.1002/jmv.25681
2. Chung M, Bernheim A, Mei X, Zhang N, Huang M, Zeng X, et al. CT Imaging Features of 2019 Novel Coronavirus (2019-nCoV). *Radiology.* 2020; 295: 202-7. doi:10.1148/radiol.2020200230
3. Pan F, Ye T, Sun P, Gui S, Liang B, Li L, et al. Time Course of Lung Changes at Chest CT during Recovery from Coronavirus Disease 2019 (COVID-19). *Radiology.* 2020; 295: 715-21. doi:10.1148/radiol.2020200370
4. Bai HX, Hsieh B, Xiong Z, Halsey K, Choi JW, Tran TML et al. Performance of Radiologists in Differentiating COVID-19 from Non-COVID-19 Viral Pneumonia at Chest CT. *Radiology.* 2020; 296: E46-E54. doi:10.1148/radiol.2020200823
5. Prokop M, van Everdingen W, van Rees Vellinga T, Quarles van Ufford H, Stöger L, Beenen L, et al. CO-RADS: A Categorical CT Assessment Scheme for Patients Suspected of Having COVID-19-Definition and Evaluation. *Radiology.* 2020; 296: E97-E104. doi:10.1148/radiol.2020201473
6. Zhou S, Wang Y, Zhu T and Xia L. CT Features of Coronavirus Disease 2019 (COVID-19) Pneumonia in 62 Patients in Wuhan, China. *AJR Am J Roentgenol.* 2020; 214: 1287-94. doi:10.2214/AJR.20.22975
7. Hu Q, Guan H, Sun Z, Huang L, Chen C, Ai T, et al. Early CT features and temporal lung changes in COVID-19 pneumonia in Wuhan, China. *Eur J Radiol.* 2020; 128: 109017. doi:10.1016/j.ejrad.2020.109017
8. Simpson S, Kay FU, Abbara S, Bhalla S, Chung JH, Chung M, et al. Radiological Society of North America Expert Consensus Statement on Reporting Chest CT Findings Related to COVID-19. Endorsed by the Society of Thoracic Radiology, the American College of Radiology, and RSNA - Secondary Publication. *J Thorac Imaging.* 2020; 35: 219-27. doi:10.1097/RTI.0000000000000524
9. Akçay Ş, Özlü T, Yılmaz A. Radiological approaches to COVID-19 pneumonia. *Turk J Med Sci* 2020; 50: 604-10. Published 2020 Apr 21. doi:10.3906/sag-2004-160
10. Kashgari A, Al Otaibi M and Alharbi M. Lobar pneumonia in pediatric patient with COVID-19. *Int J Pediatr Adolesc Med.* 2020. doi: 10.1016/j.ijpam.2020.07.002.