Case 16630

Evolution of CT Images in a patient recovered from COVID-2019
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Section: Chest imaging
Area of Interest: Lung Thorax
Imaging Technique: CT
Case Type: Clinical Cases
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Patient: 22 years, male

Clinical History:
A male patient, 22-years-old, fever (38.5°C) and sore throat for 3 days. The patient had traveled within China in January 2020. Laboratory examination results were normal at admission.

Imaging Findings:
An axial chest CT examination obtained on day three after the onset of symptoms was normal (Fig. 1). Chest CT obtained on day seven after the onset of symptoms shows multiple patchy ground-glass opacities in both lower lobes, as well as consolidation (Fig. 2). CT examination obtained on day nine shows improvement in the extent of ground-glass opacities and consolidation, with subpleural curvilinear lines (Fig. 3). CT examinations obtained on day 14 and 18 show almost healing of the consolidations and ground-glass opacities (Fig. 4, 5). CT scan obtained on day 22 shows completely healing of the consolidations and ground-glass opacities (Fig. 6).

Discussion:
Background:
COVID-19 is a new infectious disease that currently occurs mainly in China, with a small number of cases in other countries [1]. Statistical analysis on 483 patients reveals that the estimated average, mode and median incubation periods are 7.4, 4 and 7 days; Incubation periods of 92% patients were no more than 14 days [2]. While Char Leung thought the duration of quarantine should be extended to at least 3 weeks [3]. The Chinese government proposes that all people be isolated at home, and the rise in the number of infections is significantly reduced. However, there are news reports that a large increase in the number of infections caused by gatherings in South Korea has shown that prevention and control of the disease is very important. The early symptoms of the patient were fever, dry cough and fatigue [4]. Laboratory tests show that the white blood cell count is not high or decreased, and there may be a decrease in lymphocyte count. Epidemiological history and symptoms are of great help in the diagnosis of COVID-19. 2019-nCOV mainly invades lower respiratory tract infections, and CT image changes are highly characteristic [5, 6]. In this report, we present the chest CT abnormalities found on consecutive examinations obtained in the same patient.

Clinical Perspective:
Current treatments have shown that the antiviral treatment of COVID-19 combined with traditional Chinese medicine decoction is effective.

Outcome:

Initially laboratory studies on January 23 showed normal white blood cell count and lymphocyte cell count and the chest CT examination obtained on day three after onset of the symptoms shows normal (Fig. 1). In light of the clinical presentation, the patient was diagnosed with suspected novel coronavirus pneumonia. During hospitalisation, the laboratory studies showed lymphopenia. Several additional laboratory tests were abnormal, including C-reactive protein (41.6 mg/L; normal range, 0–10 mg/L), serum amyloid A protein (146.3 mg/L; normal range, 0–10 mg/L); serum interleukin-6 (11.2 pg/ml; normal range 0.373–0.463 ng/L); lymphocyte subgroups: CD4+T-lymphopenia (149/?l; normal range 450-1440/?l), CD8+T-lymphopenia (132/?l; normal range 320-1250/?l). CT examination obtained on day seven after the onset of symptoms shows multiple patchy ground-glass opacities and consolidation in both lower lobes. CT examination obtained on day nine shows decreased ground-glass opacities and consolidation, with subpleural curvilinear lines. CT examinations obtained on day 14 and 18 show almost healing of the consolidations and ground-glass opacities. On day 22 the CT images are normal.

The patient was treated with antiviral drugs ((Celiba) lopinavir / ritonavir), Chinese medicine decoction and nasal cannula oxygen (concentration: 30%). The patient was discharged on day 24 after onset of the symptoms.

Essentials for radiologists:

The CT images of the novel coronavirus pneumonia are characterised by peripheral ground-glass opacities and consolidation. However, this manifestation is not specific; COVID-19 infection is a diagnosis of exclusion until a specific lab test is obtained.

Take Home Message:

CT examination plays an important role in displaying the occurrence, development, and healing of the novel viral infection in the lungs of the COVID-19 patient.

Written informed patient consent for publication has been obtained.

**Differential Diagnosis List:** Coronavirus disease-19 (COVID-19), Upper respiratory tract infection, Bacterial pneumonia, Hypersensitivity pneumonitis (HSP)

**Final Diagnosis:** Coronavirus disease-19 (COVID-19)

**References:**


Leung CJm. Estimating the distribution of the incubation period of 2019 novel coronavirus (COVID-19) infection between travelers to Hubei, China and non-travelers. 2020. This article is a preprint and has not been peer-reviewed.


Pan F, et al. Time course of lung changes on chest CT during recovery from 2019 novel coronavirus (COVID-19) pneumonia. 2020. This article is a preprint and has not been peer-reviewed.

Figure 1

Description: Axial chest CT examination obtained on day three after the onset of symptoms is normal.
Origin: Department of Radiology, Fuyang Second People’s Hospital, Fuyang, Anhui, China 2020
Description: Note progression of disease on day seven after the onset of symptoms, with multiple patch ground-glass opacities (black arrows) in bilateral lower lobes, as well as consolidation (white arrows). Origin: Department of Radiology, Fuyang Second People’s Hospital, Fuyang, Anhui, China 2020
Description: Note progression of disease on day seven after the onset of symptoms, with multiple patch ground-glass opacities (black arrows) in bilateral lower lobes, as well as consolidation (white arrows). Origin: Department of Radiology, Fuyang Second People’s Hospital, Fuyang, Anhui, China 2020
Description: CT examination obtained on day nine shows improvement in the extent of ground-glass opacities and consolidation (black arrow), with subpleural curvilinear lines (white arrow). Origin: Department of Radiology, Fuyang Second People's Hospital, Fuyang, Anhui, China 2020
Figure 4

Description: CT examination obtained on day 14 shows almost healing of the consolidations and ground-glass opacities (white arrows). Origin: Department of Radiology, Fuyang Second People’s Hospital, Fuyang, Anhui, China 2020
**Figure 5**

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**Description:** CT examination obtained on day 18 shows that the consolidations and ground-glass opacities are almost healed. **Origin:** Department of Radiology, Fuyang Second People’s Hospital, Fuyang, Anhui, China 2020
Figure 6

Description: CT examination obtained on day 22 shows healing of the consolidations and ground-glass opacities. Origin: Department of Radiology, Fuyang Second People's Hospital, Fuyang, Anhui, China 2020