2019 Novel Coronavirus (COVID-19) Pneumonia CT 影像學特徵

放射診斷科 董又誠醫師

Emerging Coronavirus 2019-nCoV Pneumonia

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Table 2. Distribution of the Lesions in 51 Patients with 2019-nCoV pneumonia

Findings	Number of patients (%)	Number of lesions (%)*
Unilateral lung	7 (14%)	40 (3%)
Bilateral lung	44 (86%)	1284 (97%)
One lobe	4 (8%)	12 (0.9%)
Two lobes	8 (16%)	64 (5%)
Three lobes	6 (12%)	54 (4%)
Four lobes	12 (24%)	276 (21%)
Five lobes	20 (39%)	918 (69%)
Involved lung zones		
Upper lobes	43 (84%)	485 (37%)
Middle lobe	30 (59%)	136 (10%)
Lower lobes	46 (90%)	703 (53%)
Predominant distribution		
Anterior	9 (18%)	145 (11%)
Posterior	41 (80%)	1179 (89%)
Peripheral	44 (86%)	1198 (91%)
Central	5 (10%)	42 (3%)
Both central and peripheral	1 (2%)	84 6%)

*Of 1324 chest CT lung abnormalities in 51 patients

Table 3. CT Imaging Findings in 51 Patients with 2019-nCoV pneumonia

Lesions	No. of patients (%)	No. of lesions (%) *
Pure GGO	39 (77%)	395 (30%)
GGO with reticular and/or interlobular septal thickening	38 (75%)	519 (39%)
GGO with consolidation	30 (59%)	238 (18%)
Consolidation	28 (55%)	172 (13%)
Air bronchogram	41 (80%)	279 (-)**
reticulation	11 (22%)	20 (-)
Pleural effusion	4 (8%)	5 (-)
Pericardial effusion	3 (6%)	3 (-)
Lymphadenopathy	3 (6%)	6 (-)

Key results:

Nearly all patients in this series with 2019-nCoV pneumonia (50/51 patients, 98%) had a history of the contact with individuals from Wuhan, China.

Chest CT showed pure ground grass opacities (GGOs) in 77% patients, GGOs with interstitial and/or interlobular septal thickening in 75% patients, GGOs with consolidation in 59% cases.

On chest CT, GGOs were bilateral in 88% of patients involving the posterior lungs in 82% and peripheral in 85% of patients.

Materials and Methods: Fifty-one patients (25 men and 26 women, 16-76 years old) with 2019-nCoV pneumonia confirmed with the positive new coronavirus nucleic acid antibody underwent thin-section CT. The imaging findings, clinical and laboratory data were evaluated.

Conclusions: Patients with fever and/or cough and with conspicuous ground grass opacity lesions in the peripheral and posterior lungs on CT images combined with normal or decreased white blood cells and a history of epidemic exposure are highly suspected of 2019-nCoV pneumonia.

In conclusion, the most common patterns of 2019-nCoV pneumonia on thin-section CT images are pure GGO, GGO with reticular and/or interlobular septal thickening, GGO with consolidation, and consolidation, with prominent distribution in the posterior and peripheral part of the lungs. Consolidation lesions could be served as a marker of disease progression or more severe disease. Though the positive nucleic acid testing is the diagnostic golden standard, patients with fever and/or cough and with GGO prominent lesions in the peripheral and posterior part of lungs on CT images, combined with normal or decreased white blood cells and a history of epidemical exposure, should be highly suspected of the 2019-nCoV pneumonia.

- Positive nucleic acid testing
  - golden standard
- Highly suspect of 2019-nCoV pneumonia
  - patients with fever and/or cough
  - GGO lesions in the peripheral and posterior part of lungs on CT images
  - normal or decreased white blood cells
  - history of epidemical exposure

Table 4. Proportion of ground glass opacity (GGO) and consolidation lesions for patients with

2019 nCOV, stratified by disease onset to CT interval and by age

Type of lung lesion	Interval from disease onset to CT ≤ 4 days (29 patients)	Interval from disease onset to CT > 4 days (22 patients)	p value	Age ≤ 50 years (27 patients)	Age > 50 years (24 patients)	p value
GGO*	483 （79%）	281 （40%）	<.001	656 （77%）	258 （55%）	<.001
Consolidation**	129 （21%）	431 （61%）	<.001	198 （23%）	212 （45%）	<.001
Total lesions	612	712		854	470	

*GGO includes pure GGO and GGO with reticular and/or interlobular septal thickening.

**Consolidation includes GGO with consolidation and pure consolidation.

* The total number of lung lesions (Pure GGO, GGO with reticular and/or interlobular septal thickening, GGO with consolidation, and Consolidation) was 1324. A lesion occupying only one lung segment was counted as one lesion. When a large lesion or fused lesion involved more than 1 lung segment, the lesion number was recorded as the number of the involved lung segments. For example, a large lesion involving 3 lung segments was counted as 3 lesions.

Each side of the chest containing pleural fluid was counted as 1 lesion. A pericardial effusion was counted as 1 lesion.

**Air bronchograms, reticulation, pleural effusions, pericardial effusions and lymphadenopathy were not in the total number of 1324 lung lesions.

Fig. 1 a-c. Baseline CT images (a) at admission of a 35 year old male show multiple patchy pure ground glass opacity (GGO), GGO with reticular and/or interlobular septal thickening. patchy, focal, often rounded, peribronchovascular and subpleural opacities associated with reticulation and architectural distortion. The lesions are mostly distributed in the peripheral and posterior part of the lungs. Follow-up CT images (b-c) on day 5 after admission show prominent progression with increased size and density of the lesions, greater consolidation and with interval new bilateral pleural effusions and likely bibasilar compression atelectasis (c).
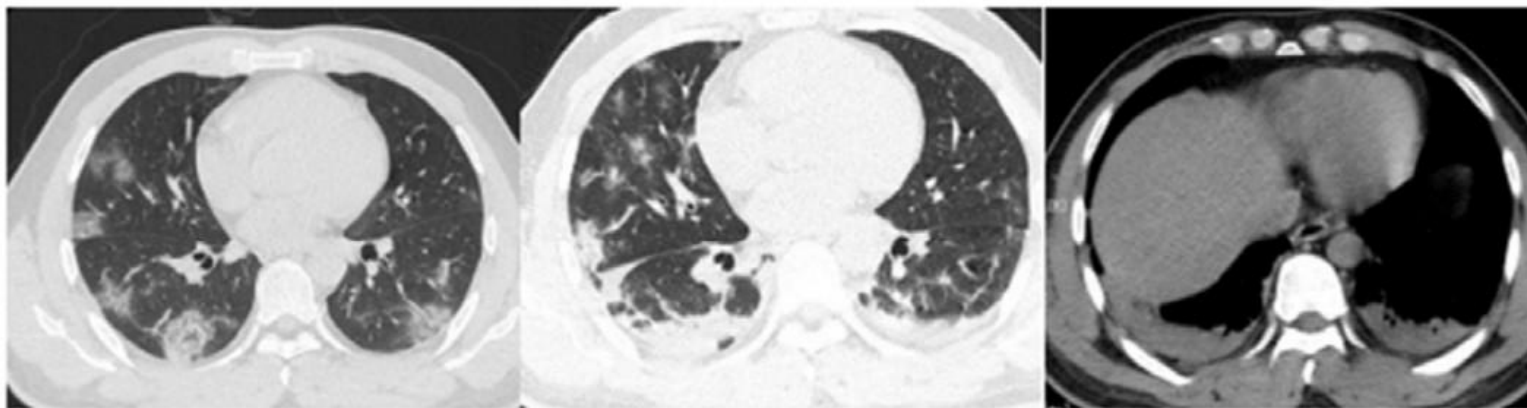
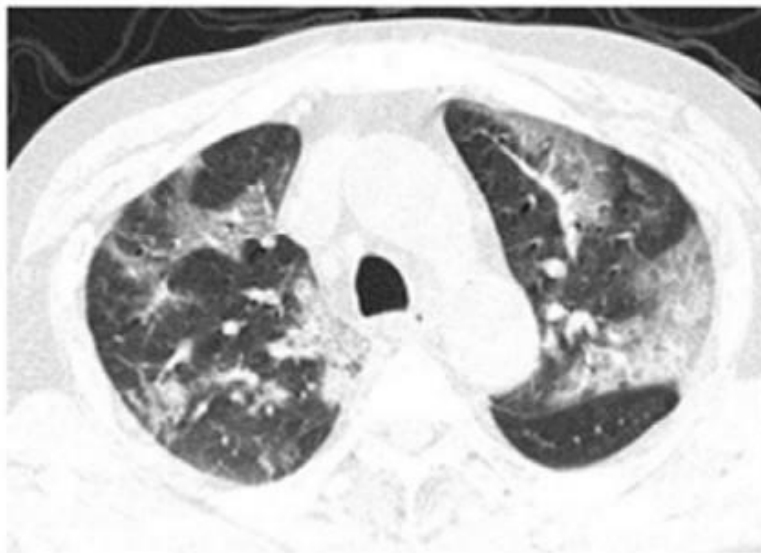

Admission   Day 5   Day 5
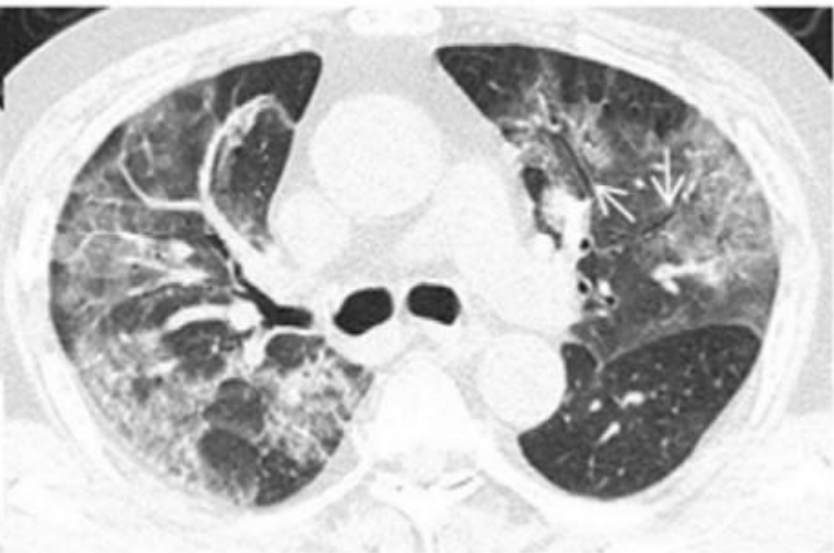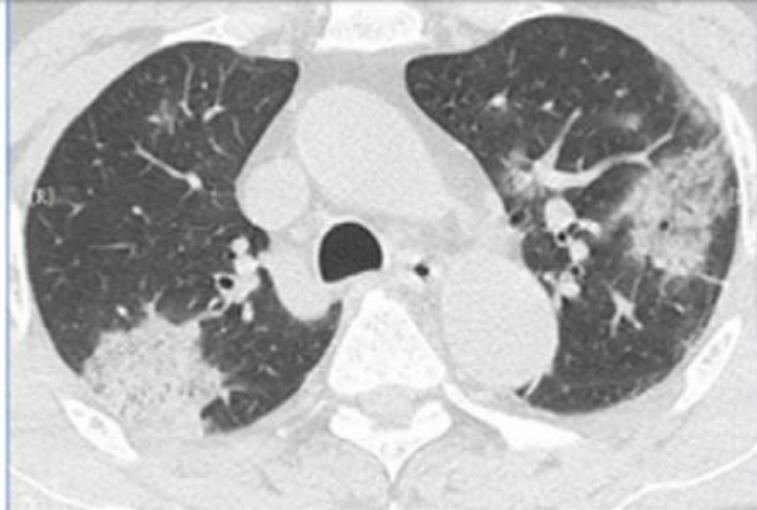
a.   b.   c.
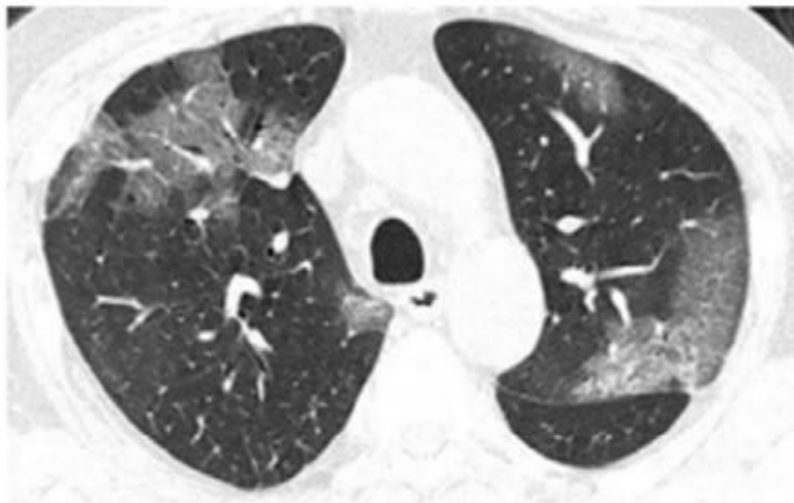
Admission

a.

Admission

b.

Day 3
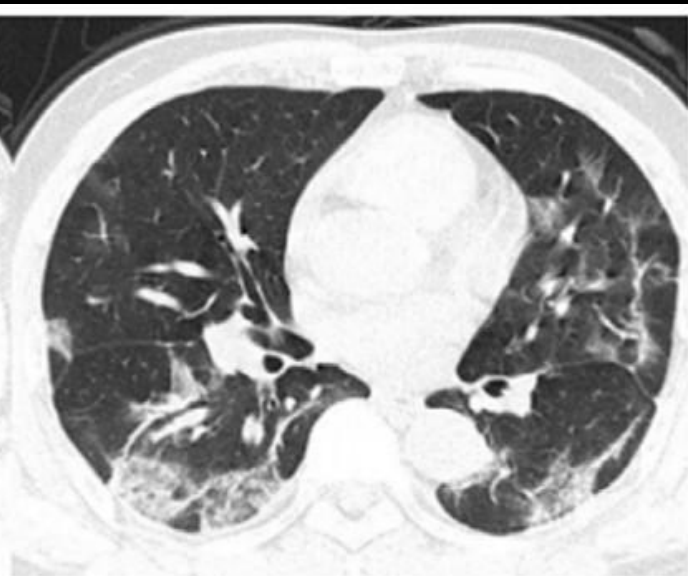
c.

Day 3

d.

Admission

Day 2

a

b

Day 4

Day 6

c

d

Admission

a.

Admission

b.

Day 5

c.

Day 5

d.