



Aspiration Pneumonia or COVID-19 Infection: A Diagnostic Challenge

From:

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Dear Editor—Pneumonia caused by aspiration of different materials such as oropharyngeal secretions or gastric content into the airway may result in serious complications. Altered mental status, neurological disorders, and trauma are among the major predisposing factors for aspiration, secondary to impaired natural defense mechanisms such as gag and cough reflexes (1). Aforementioned conditions contribute to a large number of admissions to the emergency departments. Some of these patients may initially undergo Chest CT scan either because of respiratory manifestations or nonrespiratory signs and symptoms (as in trauma patients with suspected fractures). In routine clinical practice, detection of patches of consolidation in posterior parts of upper lobes or superior segments of lower lobes in a patient with a known risk factor for aspiration suggest a correct diagnosis (1,2), however, the interpretation of chest findings may not be necessarily easy for the emergency radiologists and physicians in the setting of corona pandemic, as some radiologic features overlap those of COVID-19 pneumonia. This was one of the problems we encountered during the epidemic, because of the occurrence of a parallel outbreak of alcohol poisoning (3). There were several cases of methanol intoxication referred with altered mental status and simultaneous findings in chest CT scan. Similar cases potentially pose a challenge in making an initial decision for appropriate allocation of the patients to the COVID or non-COVID wards or ICUs before the results of Reverse transcription polymerase chain reaction (RT-PCR) are ready. This is of utmost importance in places where ICU beds are limited. Moreover, correct triage of these patients is mandatory to decrease the risk of spread of infection and to protect the medical personnel from inadvertent exposure to the infection. On the other hand, prompt administration of antibiotics in the presumed cases of aspiration pneumonia is mandatory to prevent morbidity and mortality (4).

Although the gold standard of the diagnosis of COVID infection is PCR testing, radiologic findings together with the clinical data have also been implicated at least for the

initial decision-making (5). In some cases, definite discrimination of the two entities might be impossible solely based on the imaging, however, some radiologic features may suggest one diagnosis over the other. While lobar or segmental pneumonia, lung abscess, and empyema have been reported as complications of aspirations, none of these findings are regarded as typical for COVID-19 pneumonia (5). Centrilobular nodules and tree-in-bud sign are commonly seen in cases with aspiration (64%–74%) (2). Interestingly, these CT findings are not frequent in COVID-19 pneumonia and have been categorized as “Atypical” by Radiological Society of North America (RSNA) (5) and therefore could be of some value in proposing a differential diagnosis.

Bilateral subpleural patches of ground glass opacity (GGO), especially in basal distribution, have been described as typical for the diagnosis of COVID-19 pneumonia in suspected cases. Such a presentation is also fairly common in aspiration pneumonia. These changes which had been present in up to 74% of the patients (2) make the discrimination more difficult. In such cases, attention to the pattern of distribution of the lesions may be helpful. Although posterobasal lung involvement is the most common distribution pattern in both conditions, anterior lung involvement has rarely been reported in aspiration pneumonia, thus detection of radiologic findings in anterior parts is more suggestive of COVID pneumonia rather than aspiration. In addition, Atol sign and subpleural sparing which have been reported in some of the COVID-19 cases, are not usual findings in aspiration pneumonia, although further studies are needed to assess the predictive value of these radiologic signs.

In conclusion, despite possible radiologic and clinical similarities between aspiration and COVID pneumonia, one could suggest a correct diagnosis by careful examination of the CT images together with attention to the clinical scenario and judicious utilization of laboratory tests. Timely diagnosis and treatment positively influence prognosis and reduce mortality.

REFERENCES

1. Franquet T, Giménez A, Rosón N, et al. Aspiration diseases: findings, pitfalls, and differential diagnosis. *Radiographics* 2000; 20:673–685.
2. Komiya K, Ishii H, Umeki K, et al. Computed tomography findings of aspiration pneumonia in 53 patients. *Geriatr Gerontol Int* 2013; 13:580–585.
3. Iranpour P, Firoozi H, Haseli S. Methanol poisoning emerging as the result of COVID-19 outbreak; radiologic perspective. *Acad Radiol* 2020; 27:755–756.
4. Mandell LA, Niederman MS. Aspiration pneumonia. *New Engl J Med* 2019; 380:651–663.
5. Simpson S, Kay FU, Abbara S, 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. *Radiology* 2020; 2:e200152.

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