

CORRESPONDENCE

COVID-19 Case Complicated with Organizing Pneumonia and Pneumothorax: Correspondence

TO THE EDITOR—Organizing pneumonia on imaging may be seen as unilateral or bilateral peripheral peribronchovascular ground glass or air space consolidation, large nodules commonly with consolidation, or in some patients, peripheral consolidation. The bilateral consolidation typically has subpleural extension without subpleural sparing. Subpleural sparing is typically seen in chronic lung disease such as nonspecific interstitial pneumonitis (NSIP). Other descriptions are of a nodule with a reverse halo (atoll sign), where a ground glass nodule is surrounded by a rim of consolidation.

This single axial computed tomography (CT) image of the lungs (**Figure 1**) shows findings more suggestive of atypical pneumonia, such as COVID-19, which was the patient's clinical diagnosis.[1] Although many imaging findings have been reported with COVID-19 pneumonia, the most predominate are ground glass opacities or ground glass opacities with consolidation, which are subpleural. **Figure 1** shows subpleural extension of the opacities, with just a few areas of subpleural sparing. The majority of the opacities extend to the pleural surface. This CT appearance in a patient day 9 after COVID-19 infection is most diagnostic of COVID-19 pneumonia, as the peak in CT chest findings is most typical around day 10. A radiologic diagnosis of organizing pneumonia in the absence of the atoll sign would require a longer-term history of symptoms (several months) or a comparison exam showing long-term unresolved pulmonary opacities. Organizing pneumonia diagnosis, while it may be in a differential on CT, requires histologic sampling for diagnosis.

Anonymous Reviewer

1. Phillips TE, Bhatti HA, Ho MQ. COVID-19 case complicated with organizing pneumonia and pneumothorax: A case report. *Univ Louisville J Respir Infect* **2022**; 6(1):Article 12. doi: [10.55504/2473-2869.1237](https://doi.org/10.55504/2473-2869.1237).

THE AUTHORS' REPLY—We thank the reviewers for their valuable and thought-provoking inputs. We agree with most of their comments and have added additional commentary to contribute to our diagnosis of organizing pneumonia.

(1) We agree that organizing pneumonia typically has a sub-acute manifestation over months; however, it can present over several weeks as noted by King *et al.*[1] It

is possible that the patient had symptoms for longer period of time before he started seeking care as there was other documentation that he has had cough for at least 10 days prior. However, we chose to document 3 days because that was what he reported to us.

(2) We agree that the “atoll sign” is relatively specific for organizing pneumonia; however, several other computed tomography (CT) imaging findings have been recognized as consistent with the diagnosis of organizing pneumonia in the right clinical context.[2, 3] Organizing pneumonia can present as bilateral thick bands of consolidation (>8 mm) which are subpleural in location and radial or curvilinear in configuration as indicated in **Figure 2**.

Similarly, an “arcade-like” sign is also described in the literature as a manifestation of organizing pneumonia. This is a feature of perilobular fibrosis, whereby organizing pneumonia projects on imaging as curved or arched consolidation bands reaching the pleural surface as shown in **Figure 3**. Ujita *et al.* noted this perilobular pattern in 57% of patients presenting as organizing pneumonia on CT scans.[4]

We believe that both forms of these curvilinear CT imaging signs are present in our patient.

(3) Diagnosis of organizing pneumonia is best made through lung biopsy. In many cases, this is not feasible, and a diagnosis of organizing pneumonia can alternatively be established by long-term radiological follow-up showing persistent residual opacities post-therapy.[1] We believe that the CT comparison in **Figure 4** (approximately 3 months apart), speaks to this statement.

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2. Baque-Juston M, Pellegrin A, Leroy S, Marquette CH, Padovani B. Organizing pneumonia: what is it? A conceptual approach and pictorial review. *Diagn Interv Imaging* **2014**; 95(9):771-7. doi: [10.1016/j.diii.2014.01.004](https://doi.org/10.1016/j.diii.2014.01.004). PMID: [24559802](https://pubmed.ncbi.nlm.nih.gov/24559802/).

3. Chiarenza A, Esposto Ultimo L, Falsaperla D, et al. Chest imaging using signs, symbols, and naturalistic images: a

practical guide for radiologists and non-radiologists. *Insights Imaging* **2019**; 10(1):114. doi: [10.1186/s13244-019-0789-4](https://doi.org/10.1186/s13244-019-0789-4). PMID: [31802270](https://pubmed.ncbi.nlm.nih.gov/31802270/).

4. Ujita M, Renzoni EA, Veeraraghavan S, Wells AU, Hansell DM. Organizing pneumonia: perilobular pattern at thin-section CT. *Radiology* **2004**; 232(3):757-61. doi: [10.1148/radiol.2323031059](https://doi.org/10.1148/radiol.2323031059). PMID: [15229349](https://pubmed.ncbi.nlm.nih.gov/15229349/).

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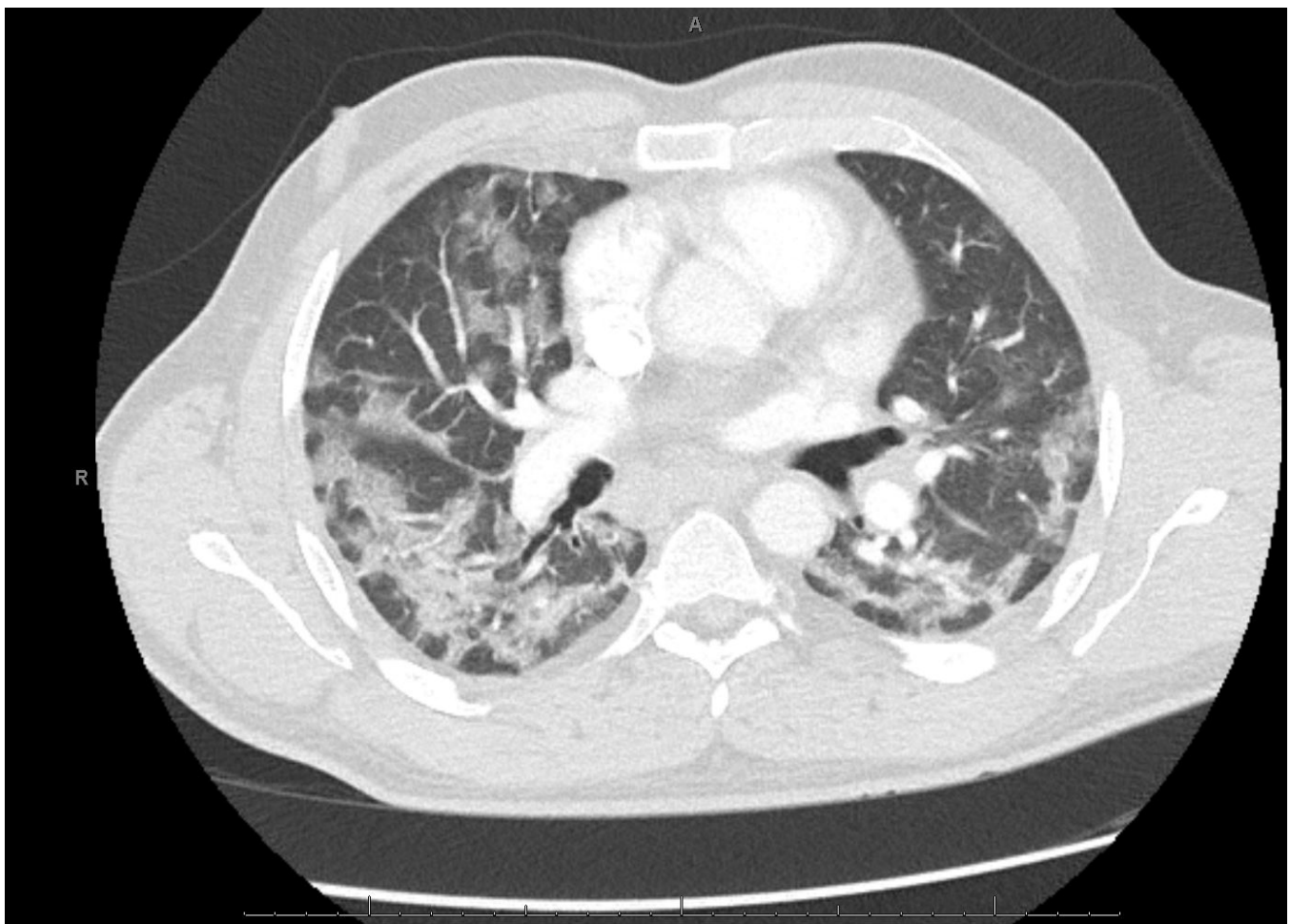


Figure 1. Patient's chest computed tomography from hospital day 0 of the first admission, which showed bilateral patchy curvilinear consolidation pattern with subpleural sparing consistent with organizing pneumonia post-COVID-19 infection (**Figure 3** in original article).

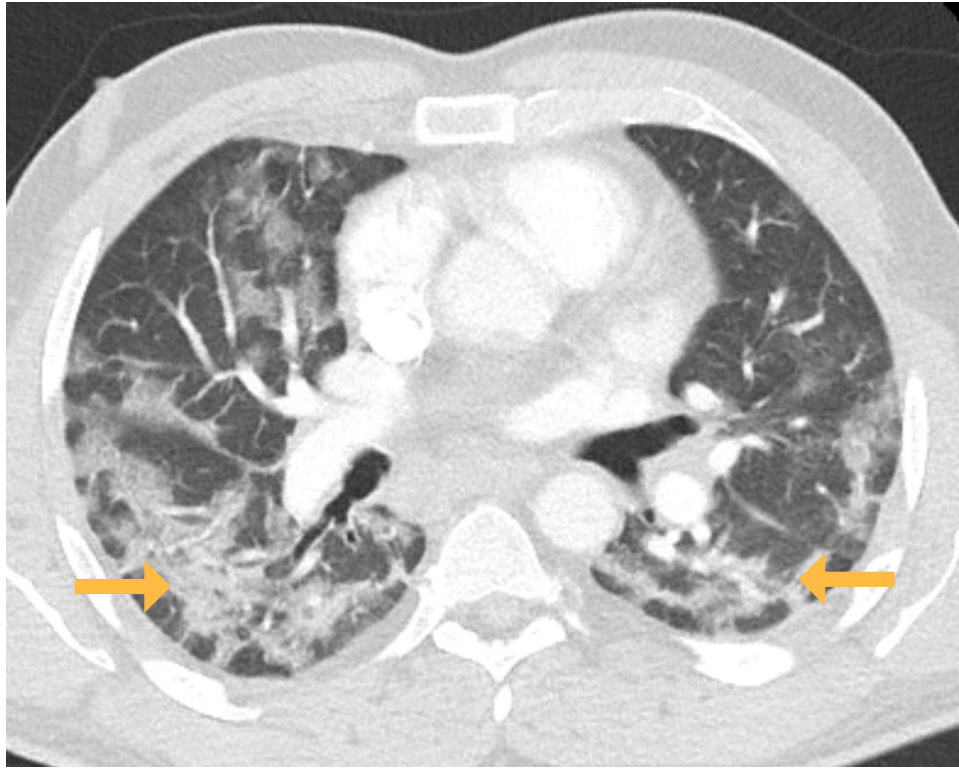


Figure 2. Bilateral thick bands of consolidation, subpleural in location and radial or curvilinear in configuration.

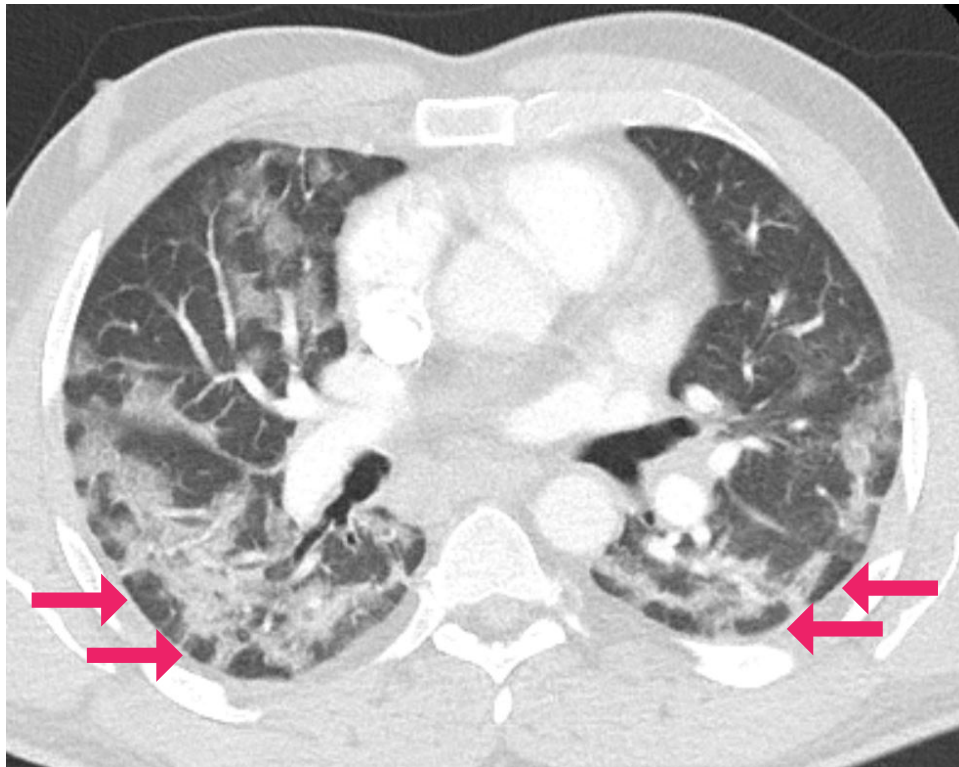
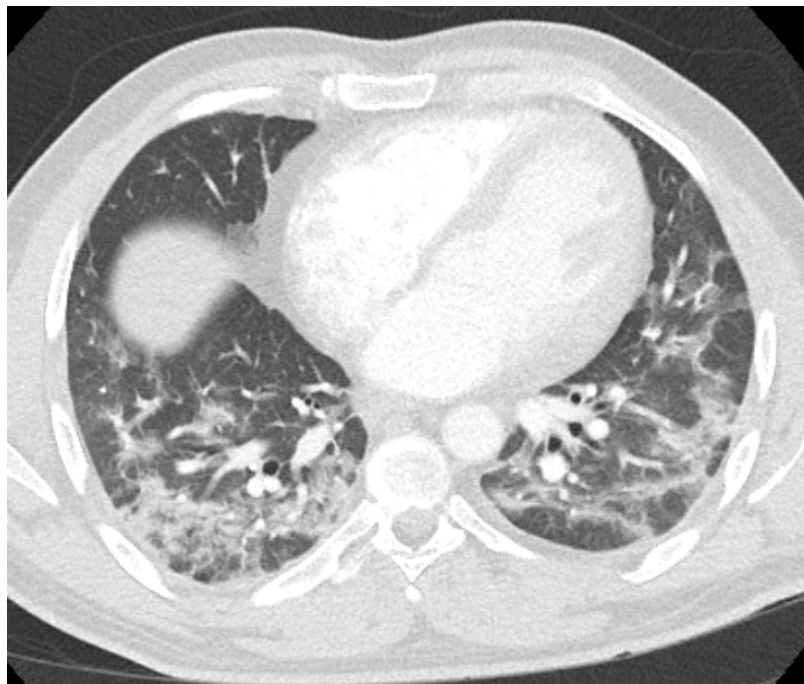
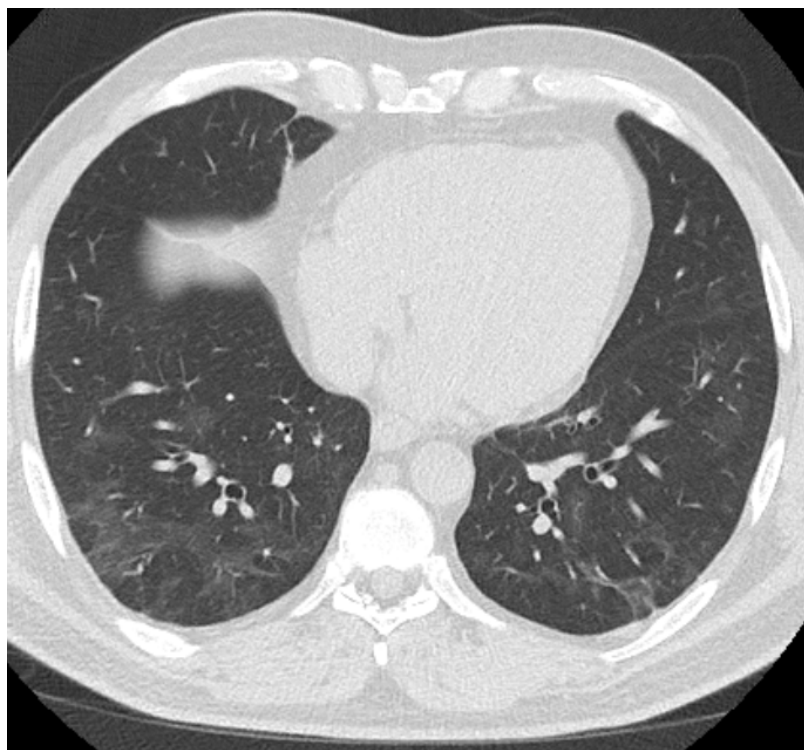


Figure 3. Perilobular pattern of curved or arched consolidation bands reaching the pleural surface.



a)



b)

Figure 4. Computed tomography of the lungs, showing persistent residual opacities post-therapy. Images a) and b) were taken three months apart.