

## Organizing Pneumonia Developing Secondary to Bone Fragment Aspiration in an Adult Patient: A Rare Case

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**Abstract:** Organizing pneumonia is an interstitial lung disease, which occurs with distinctive clinical, imaging, and histomorphological findings in patients. The histopathologic characteristics of organizing pneumonia are the presence of myofibroblastic plugs in the lumens of the respiratory bronchioles, alveoli, and alveolar ducts. Organizing pneumonia may be cryptogenic or secondary to different known reasons. It can also develop secondary to aspiration. Foreign body aspiration is less common in adults than in children. It may appear as a serious medical problem that endangers life, especially in the older age group. In this article, we present a case of organized pneumonia that developed secondary to bone fragment aspiration in an elderly patient with characteristic histological findings.

### INTRODUCTION

Organizing pneumonia (OP) is an interstitial lung disease, which occurs with distinctive clinical, imaging, and histomorphological findings in patients<sup>1</sup>. Histomorphologically, it is described by intra-alveolar buds of granulation tissue, comprising of intermixed myofibroblasts and connective tissue in the bronchiolar lumen, alveolar ducts, and some alveoli. The granulation tissue is called Masson bodies. The clinical and radiological findings of OP can vary and are generally non-specific<sup>2</sup>. Foreign body aspiration is less common in adults than in children. It may appear as a serious medical problem that endangers life, especially in the older age group. However, in adults, foreign-body aspiration can remain undetected for a long time without any symptoms<sup>3</sup>. To the best of our knowledge, there are no cases of organized pneumonia developing after bone fragment aspiration in the literature. We aimed to present a case of organized pneumonia that developed secondary to bone fragment aspiration and had characteristic histological findings.

Received :16.01.2021  
 Received in revised form :08.03.2021  
 Accepted :20.03.2021  
 Available online :03.05.2021

Keywords:

Bone  
 Organizing pneumonia  
 Foreign body aspiration

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 http://dx.doi.org/10.29228/jamp.48918

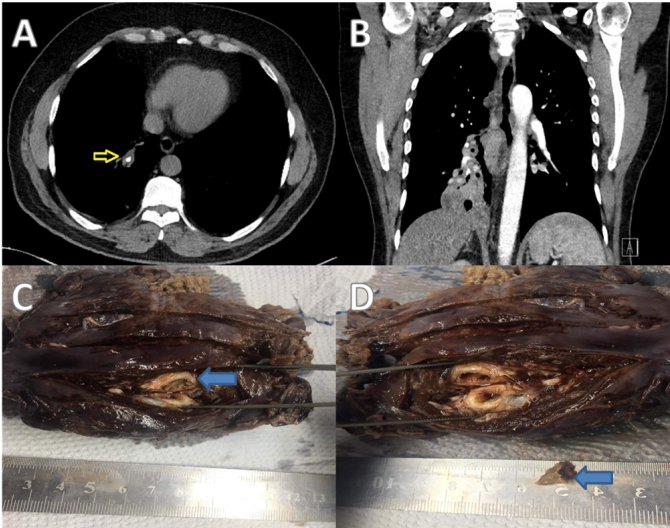
Int J Acad Med Pharm,  
 2021; 3 (2); 192-194

### Case report

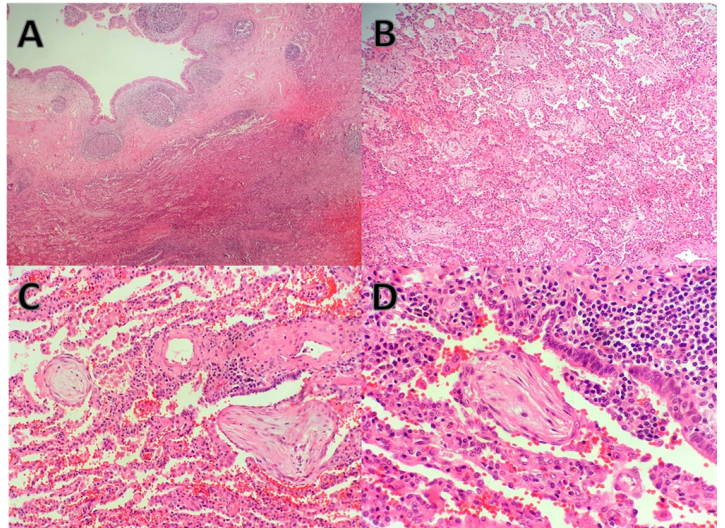
A 60-year-old male patient was admitted to a different department of our hospital two years ago with a cough that has lasted for about a year. Herein, the patient underwent bronchoscopy. After bronchoscopy, the foreign body was seen in the right lower lobe bronchus of the patient and was removed. The removed piece was bone tissue, but the patient could not remember that he had aspirated anything. The patient did not have any symptoms for two years. At the end of the second year, the patient was admitted to our Department of Thoracic Surgery with sputum production and fever. Thorax computed tomography of the patient demonstrated abscess and bronchiectasis in the lower lobe of the right lung. Additionally, a hyperdense appearance was observed compatible with a foreign body [Figure 1 (A)]. Abscess and bronchiectasis did not regress after antibiotic treatment [Figure 1 (B)]. Because of that video thoracoscopic right lower lobectomy was performed. Macroscopically, the lobectomy material had a size of 11x9.5x4 cm. In the sections of the material, an irregularly bound, green-brown, hard consistency material of size 1.4x1x0.6 cm was observed in the bronchus [Figure 1 (C), (D)] and hemorrhage was seen around the bronchus. Microscopically, marked enlargement of the bronchi and intense mononuclear inflammatory cell infiltration with locally formed germinal centers on the bronchial wall was observed [Figure 2 (A)]. Many Masson bodies [Figure 2 (B)], in alveolar sacs [Figure 2 (C)] and ducts [Figure 2 (D)], which are occurred spindled fibroblasts in pale staining matrix of immature loose collagen with polypoid shape, were seen. There were also a large number of fibrous plugs [Figure 3 (A)]. Foamy macrophage accumulation, mixed inflammatory cell infiltration,

and hemorrhage in surrounding airspace were present [Figure 3 (B)]. Microscopic images of the foreign body were compatible with bone tissue [Figure 3 (C), (D)]. With these findings, we diagnosed the

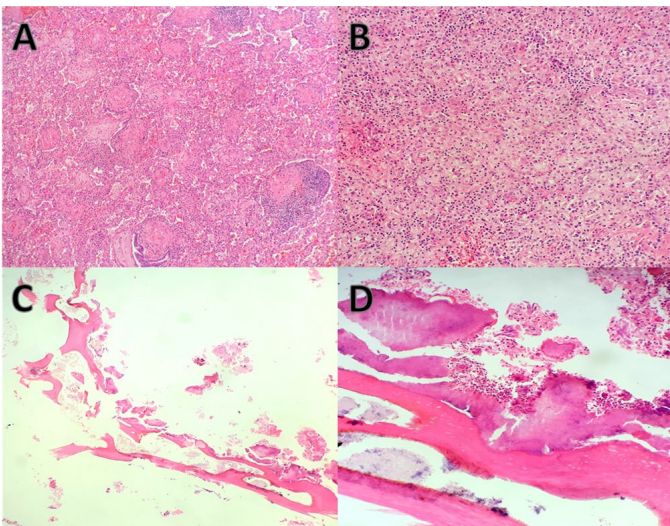
patient with organized pneumonia secondary to bone fragment aspiration. The patient was discharged on the 5th postoperative day without any problem.



**Figure 1.** (A) CT scan of the chest showing hyperdense appearance compatible with a foreign body. (B) CT scan of the chest showed that abscess and bronchiectasis developed in the lower lobe of the right lung. (C) The foreign body is seen in the bronchus. (D) A foreign body which gray-brown colored, irregularly bounded is seen.



**Figure 2.** (A) Marked enlargement of the bronchi and intense mononuclear inflammatory cell infiltration (H&E  $\times 50$ ). (B) Numerous Masson bodies in ducts and alveoli (H&E  $\times 100$ ). (C) Masson bodies which are occurred spindled fibroblasts in pale staining matrix of immature loose collagen (H&E  $\times 200$ ). (D) Masson body in the duct (H&E  $\times 400$ ).



**Figure 3.** (A) A large number of fibrous plugs are visible (H&E  $\times 100$ ) (B) Foamy macrophage accumulation and mixed inflammatory cell infiltration (H&E  $\times 200$ ). (C) Mature lamellar bone tissue (H&E  $\times 40$ ). (D) Mature bone tissue on the lower side and spilled respiratory epithelium on the upper side (H&E  $\times 200$ ).

## DISCUSSION

OP is a rare entity and it has very characteristic clinicopathological features among lung diseases. It may be cryptogenic or may develop secondary to different known reasons. Some of the known reasons are infections, connective tissue diseases, drug reactions, neoplasias, radiation, organ transplantation, and aspiration. If an underlying cause cannot be found, it is called cryptogenic organizing pneumonia<sup>2</sup>.

The exact mechanism of injury leading to the formation of OP remains unclear. However, recent pathologic studies suggest that injury to the alveolar epithelium may play a significant role<sup>4</sup>. Al-Ghanem et al<sup>5</sup> demonstrated that the pathogenic mechanism of OP is that of an inflammatory lung disease rather than a fibrosing course. Since OP is an effect of an inflammatory reaction to lung injury, good treatment response is seen with broad-spectrum anti-inflammatory agents<sup>6</sup>.

Although foreign body (FB) aspiration is a rare condition, it can cause serious problems. It is associated with significant morbidity and mortality. FB aspiration occurs more frequently in children. Approximately 75% of cases occur in children younger than 3 years of age. The probability of incidence increases with aging, and aspiration may be life-threatening particularly for older patients. Due to the non-specificity of the clinical presentations, FB aspiration can be misdiagnosed, and the diagnosis can be delayed for months to years, especially in elderly patients<sup>7</sup>.

Symptoms such as coughing, wheezing, shortness of breath, hemoptysis, and choking are widely seen in the case of FB aspiration. This can usually be diagnosed by chest radiography. Computed tomography of the chest can be valuable in identifying small aspirated objects or when an associated chest disease is suspected. Bronchoscopy is often used for diagnostic and therapeutic purposes. Surgery is the final treatment option<sup>3</sup>. The most common symptom of OP is coughing. Other symptoms are dyspnea, malaise, fever, pleuritic pain, crackles, and wheezing. There is no difference between the symptoms of the cryptogenic and secondary OP. The most common radiographic abnormalities are patchy bilateral airspace opacities<sup>8</sup>. Video-assisted thoracoscopic lung biopsy is the preferred technique as it is more likely to provide sufficient tissue<sup>6</sup>.

The histopathologic characteristics of OP are the presence of myofibroblastic plugs in the lumens of the respiratory bronchioles, alveoli, and alveolar ducts. Because of these characteristics pathologic findings, biopsy for diagnosis of OP is necessary<sup>2</sup>.

Some OP cases have been reported to progress rapidly and severely. Such cases may occur mostly with acute interstitial pneumonia or acute respiratory distress syndrome. Poor prognostic features are radiological findings of interstitial fibrosis, the absence of lymphocyte predominance in bronchoalveolar lavage, the presence of accompanying disease. The histopathological findings include organized pneumonia as well as scarring and restructuring in the lung parenchyma<sup>9</sup>.

Intraalveolar fibrosis that develops after organized pneumonia regresses with corticosteroid therapy. The intra-alveolar plugs in OP have some histomorphological features with the fibroblastic foci present in usual interstitial pneumonia. However, OP is not associated

with progressive irreversible fibrosis, unlike interstitial pneumonia<sup>10</sup>.

### **Conclusion**

Foreign body aspiration in adults is extremely rare and is usually detected incidentally. Organized pneumonia can be seen after foreign body aspiration. Delayed treatment can cause complications. In an adult patient with chronic lung symptoms, foreign body aspiration should be kept in mind, even if there is no history of aspiration.

### **Conflict of interest**

The authors declare that they have no conflict of interest.

### **Acknowledgements**

None.

### **REFERENCES**

1. Akyil FT, Agca M, Mısırlıoğlu A, Arsev AA, Akyil M, Sevim T. Organizing pneumonia as a histopathological term. *Turk Thorac J* 2017;18:82–7.
2. Baha A, Yildirim F, Kocuturk N, Galata Z, Akyurek N, Demirci NY, et al. Cryptogenic and secondary organizing pneumonia: Clinical presentation, radiological and laboratory findings, treatment, and prognosis in 56 cases. *Turk. Thorac. J.* 2018;19:201-8.
3. Qureshi A, Behzadi A. Foreign-body aspiration in an adult. *Can J Surg.* 2008;51:69–70.
4. Wang HP, Chen CM, Chen YY, Chen W. Bronchiolitis obliterans organizing pneumonia as an initial presentation of systemic lupus erythematosus: A rare case report and literature review. *Case Reports in Medicine.* 2016;2016:3.
5. Sara AG, Hamdan AJ, Hanaa B, Nawaz KA. Bronchiolitis obliterans organizing pneumonia: Pathogenesis, clinical features, imaging and therapy review. *Annals of Thoracic Medicine.* 2008;3:67.
6. Jung IY, Jeon YD, Ahn MY, Goag E, Lee EH, Ahn HW, et al. A case of bronchiolitis obliterans organizing pneumonia in an hiv-infected korean patient successfully treated with clarithromycin. *BMC Infect Dis.* 2015;15:280.
7. Lin L, Lv L, Wang Y, Zha X, Tang F, Liu X. The clinical features of foreign body aspiration into the lower airway in geriatric patients. *Clin Interv Aging.* 2014;9:1613-8.
8. Sveinsson OA, Isaksson HJ, Sigvaldason A, Yngvason F, Aspelund T, Gudmundsson G. Clinical features in secondary and cryptogenic organising pneumonia. *Int J Tuberc Lung Dis.* 2007;11:689-94.
9. Cordier JF. Update on cryptogenic organising pneumonia (idiopathic bronchiolitis obliterans organising pneumonia). *Swiss Med Wkly.* 2002;132:588-91.
10. Cordier JF. Cryptogenic organising Pneumonia. *Eur Respir J.* 2006;28:422-46.