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RESPIRATORY CASE REPORTS

Unusual Presentation of Cryptogenic Organizing Pneumonia with Multiple Pulmonary Nodules Resembling Pulmonary Metastases: A Case Report

Kriptojenik Organize Pnömoni: Multipl Pulmoner Nodüller ile Akciğer Metastazını Taklit Eden Nadir Bir Olgu

Demet Polat Yuluğ[1], Eylem Sercan Ozgur[1], Sibel Naycı[1], Tuba Kara[2], Feramuz Demir Apaydın[3], Pelin Ozcan Kara[4]

Abstract

Cryptogenic Organizing Pneumonia (COP) is a lung disease characterized by multiple areas of consolidation with a subpleural distribution or ground-glass opacities, various atypical presentations of which have been reported in the literature. A 47-year-old male who presented with a cough underwent thoracic computed tomography, revealing multiple bilateral pulmonary nodules, located predominantly in the upper lobes. The nodules, the largest of which measured 20 mm, had varying border characteristics and some had frosted-glass densities. Positron emission tomography/computed tomography revealed several small lymph nodes without mediastinal pathological FDG uptake. A large number of nodules were identified in both lung parenchyma, some of which were calcified and with mildly elevated FDG uptake (early SUV max: 2.18, late SUV max: 3.14). The patient presented with an unusual radiological pattern of bilateral pulmonary nodules mimicking pulmonary metastases, however, histopathological findings were consistent with COP. This case highlights how the radiological and nuclear imaging characteristics of COP can potentially lead to misdiagnosis, such as malignancy.

Keywords: *Cryptogenic organizing pneumonia, pulmonary nodules, pet-ct.*

Öz

Kriptojenik Organize Pnömoni (COP) genellikle akciğerlerdeki terminal bronşiyoller, alveoler kanallar ve alveollerde granülasyon dokusu proliferasyonunun görüldüğü, radyolojik olarak subplevral bölgelerde yerleşen çok sayıda konsolidasyon alanı ve buzlu cam opasiteleri ile karakterize edilen, çoğunlukla etyolojisi bilinmeyen bir hastalıktır. Kırk yedi yaşında erkek hasta, geçmeyen öksürük şikayetiyle polikliniğe başvurdu. Toraks bilgisayarlı tomografide, bilateral çoğunlukla üst loblarda yerleşen, en büyüğü 20 mm boyutunda, bazıları buzlu cam dansitesinde multipl pulmoner nodüller saptandı. Pozitron emisyon tomografisi/bilgisayarlı tomografide, mediastinal patolojik FDG tutulumunu göstermeyen birkaç küçük lenf nodu mevcuttu. Bilateral akciğer parankiminde hafif artmış FDG tutulumu olan (erken SUV max: 2.18, geç SUV max: 3.14) çok sayıda nodül gözlendi. Histopatolojik analiz, kriptojenik organize pnömoni tanısı olarak sonuçlandı. Radyolojik ve pozitron emisyon tomografisi görüntüleme özellikleri akciğer metastazını taklit eden bu olgu ışığında bilateral multipl pulmoner nodüllerin ayırıcı tanısında kriptojenik organize pnömoninin de göz önünde bulundurulması gerektiğini vurgulamak istiyoruz.

Anahtar Kelimeler: *Kriptojenik organize pnömoni, pulmoner nodül, pet-ct.*

[1]Department of Pulmonary Diseases, Mersin University Faculty of Medicine, Mersin, Türkiye
[2]Department of Pathology, Mersin University Faculty of Medicine, Mersin, Türkiye
[3]Department of Radiology, Mersin University Faculty of Medicine, Mersin, Türkiye
[4]Department of Nuclear Medicine, Mersin University Faculty of Medicine, Mersin, Türkiye

[1]Mersin Üniversitesi Tıp Fakültesi, Göğüs Hastalıkları Anabilim Dalı, Mersin
[2]Mersin Üniversitesi Tıp Fakültesi, Patoloji Anabilim Dalı, Mersin
[3]Mersin Üniversitesi Tıp Fakültesi, Radyoloji Anabilim Dalı, Mersin
[4]Mersin Üniversitesi Tıp Fakültesi, Nükleer Tıp Anabilim Dalı, Mersin

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Correspondence (İletişim): Demet Polat Yuluğ, Department of Pulmonary Diseases, Mersin University Faculty of Medicine, Mersin, Türkiye
e-mail: demetpolat@windowslive.com

Cryptogenic organizing pneumonia (COP) is an interstitial lung disease characterized by proliferations of granulation tissue in the terminal airways, alveolar ducts and peribronchiolar alveoli. The etiology of COP can be either idiopathic or secondary, and known causes include chronic infections (e.g., Legionella, Mycoplasma, adenovirus), toxic inhalants (e.g., NO2), drugs, lung transplantation, radiation and collagen vascular diseases. In most cases, however, the causative agent remains unidentified, making the condition idiopathic (1,2).

The clinical and radiological findings of COP typically show dramatic improvement with corticosteroid therapy. Radiologically, COP is often characterized by multiple airspace consolidations with a peripheral, subpleural distribution, or areas of ground-glass opacity, although other, less common presentations have also been reported, making the diagnosis challenging (2,3). This case report describes a rare presentation of COP with a nodular pattern resembling miliary metastasis, highlighting the diagnostic complexity of the condition.

CASE

A 47-year-old male with a 35-year smoking history (10 cigarettes per day) presented with a persistent cough. His medical history included chronic obstructive pulmonary disease (COPD), diabetes mellitus and coronary artery disease. Upon physical examination, his vital signs were stable, but expiratory rhonchus was heard during respiratory examination. Other system examinations were unremarkable.

A chest X-ray revealed bilateral nodular opacities (Figure 1), prompting further imaging studies. A thoracic CT scan revealed multiple pulmonary nodules predominantly in the upper lobes, the largest of which measured 20 mm, and some with ground-glass densities. The scan also revealed some enlarged mediastinal (10 mm) and right suprahilar (15 mm) lymph nodes (Figure 2a).

Laboratory tests revealed the following values: leukocyte count 8.6 $\times$ $10^3/\mu$L (45% polymorphonuclear cells), C-reactive protein 1.61 mg/dL and antistreptolysin O 27.2 IU/mL. Renal and liver function tests and serologic tests for Brucella, hydatid cyst, toxoplasma, cytomegalovirus, hepatitis C and B viruses and HIV were all normal, and all autoimmune markers, including antinuclear antibody (ANA), perinuclear antineutrophil cytoplasmic antibody (p-ANCA) and cytoplasmic ANCA, were negative. A tuberculosis test was also negative.

Pulmonary function tests revealed FEV1: 1.54 L (55%), FVC: 2.59 L (75%) and FEV1/FVC ratio: 59.56%, consistent with a mixed obstructive and restrictive pattern, which could be attributable to the underlying COPD. Following initial treatment with broad-spectrum antibiotics, a follow-up CT scan revealed persistent nodules, although without any significant increase in size.

A positron emission tomography-computed tomography (PET-CT) scan revealed multiple millimetric pulmonary nodules with mildly elevated FDG uptake (early SUV max: 2.18, late SUV max: 3.14), some of which were calcified (Figure 2b). No pathological FDG uptake was detected in the mediastinal lymph nodes.

Given the suspicion of a malignancy due to the patient's smoking history and the characteristics of the nodules, a wedge resection of the lung was performed under video-assisted thoracoscopy (VATS), the histopathological examination of which revealed patchy fibroblastic plugs in the interstitium of alveoli consisting of spindled fibroblasts in a pale-staining matrix with a serpiginous or elongated shape (Figure 3a and b). Foamy macrophages, thickened alveolar septa, and rare neutrophils were also noted, confirming the diagnosis of COP.

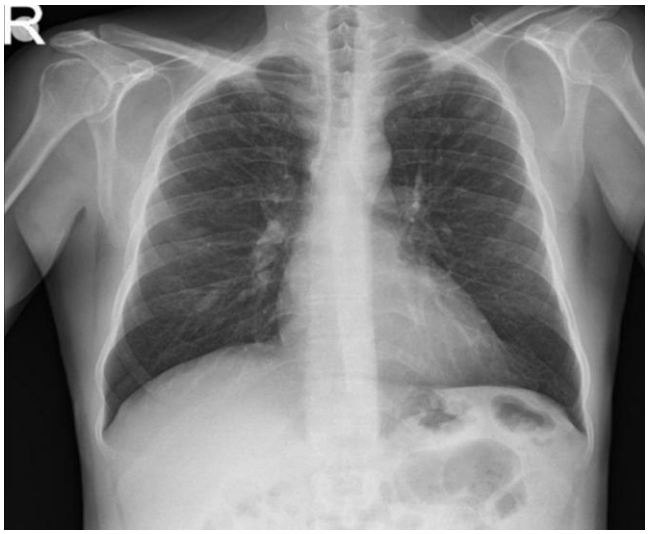

Figure 1: Chest X-ray showing bilateral nodular opacities

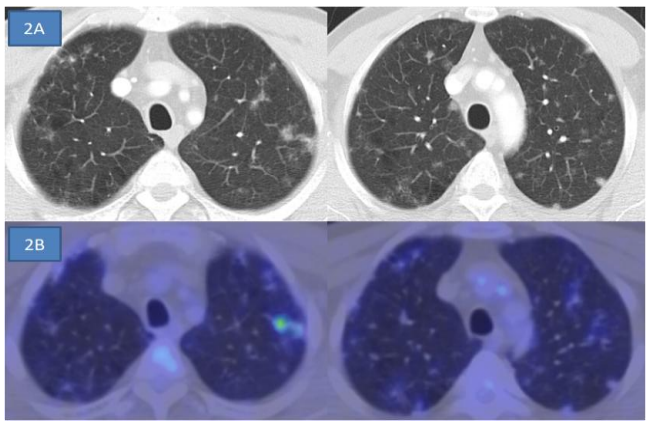

Figure 2: Thorax computed tomography. Multiple bilateral pulmonary nodules (the largest 20 mm) with variable border features detected predominantly in the upper lobe, some with opaque glass densities (A). Pet-CT: A large number of nodules observed in both lung parenchyma, with mildly elevated FDG uptake (early SUV max: 2.18, late SUV max: 3.14) (B)

The patient was started on corticosteroid therapy (48 mg/day), and a follow-up CT scan after 3 months revealed complete resolution of the pulmonary nodules (Figure 4).

The steroid treatment was discontinued at 4 months due to poorly controlled diabetes mellitus, and the patient was followed up for 5 years with no evidence of disease recurrence.

DISCUSSION

COP is a rare condition that can be challenging to diagnose due to its heterogeneous clinical and radiological features. It most commonly affects people between the ages of 50 and 60 years, with no significant predilection for either gender. Hallmark symptoms include dry cough, shortness of breath and, less commonly, fever, weight loss and crackles on auscultation (2). In the presented case, the patient exhibited a mixed pattern of lung function that was likely attributable to the concurrent COPD.

Radiologically, COP most often presents with airspace consolidation, ground-glass opacities and a peripheral distribution, particularly in the lower and middle lung zones (2–5). In the presented case, however, the patient presented with bilateral multifocal nodules predominantly in the upper lobes, which is an atypical finding for COP. This unusual presentation posed a diagnostic challenge, as the nodule pattern raised concern for metastatic disease.

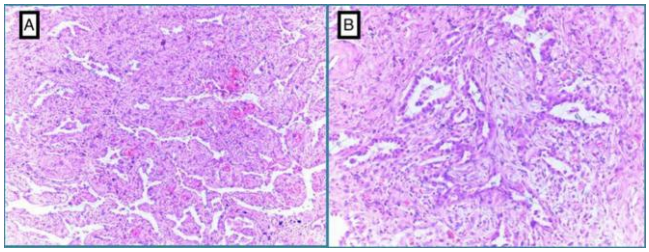

Figure 3: Thickened alveolar septa with fibroblatic plugs (x100, HE) (A); Elongated shaped spindled fibroblast in the alveolar septa (x200, HE)(B)

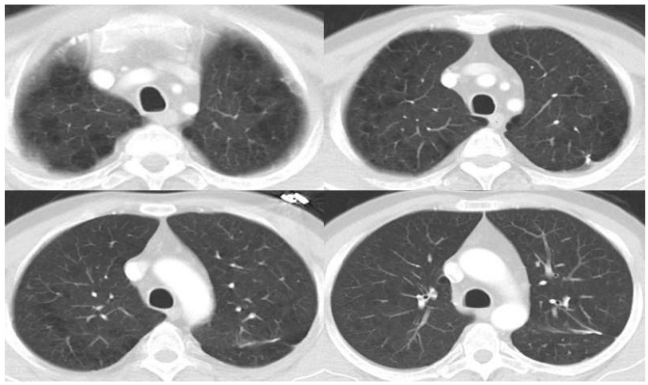

Figure 4: Post-treatment follow-up thorax computed tomography; bilateral nodular lesions completely regressed

Lymphadenopathy is not typically associated with COP. In the present case, however, mild mediastinal and suprahilar lymphadenopathy was noted that resolved completely after corticosteroid therapy. Such findings have not been widely reported in the literature, but should be highlighted as the resemblance to lymphoma or metastatic cancer can potentially complicate diagnosis.

The role of PET/CT in evaluating lung lesions is well-documented in malignancies, while its utility in COP is less clear. The mild FDG uptake in the pulmonary nodules observed in the present case could easily be mistaken for malignancy, underlining the importance of histopathological confirmation, as PET/CT findings in COP may overlap with those seen in cancer, particularly in patients with such risk factors as a smoking history.

Although there is evidence suggesting an association between COP and malignancy, particularly in patients with a history of smoking and chronic lung disease (6–8), our patient's response to corticosteroid therapy supported a diagnosis of COP rather than metastatic disease. The complete resolution of the nodules following treatment further strengthens this conclusion.

CONCLUSION

The presented case highlights the diagnostic challenge posed by COP, particularly when presenting with an unusual radiological pattern resembling pulmonary metastases, and the presence of mild lymphadenopathy and FDG uptake on PET/CT further complicated the diagnosis. Clinicians should be aware of these potential mimickers of malignancy and consider COP in the differential diagnosis when encountering patients with unexplained lung nodules. A prompt histopathological evaluation is crucial for appropriate management.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Concept - D.P.Y., E.S.O., S.N., T.K., F.D.A., P.O.K.; Planning and Design - D.P.Y., E.S.O., S.N., T.K., F.D.A., P.O.K.; Supervision - D.P.Y., E.S.O., T.K., F.D.A., P.O.K., S.N..; Funding - D.P.Y., E.S.O., T.K., S.N., F.D.A., P.O.K.; Materials - E.S.O., T.K., F.D.A., P.O.K.; Data Collection and/or Processing - D.P.Y., S.N.; Analysis and/or Interpretation - D.P.Y., E.S.O., S.N., T.K., F.D.A., P.O.K.; Literature Review - D.P.Y., E.S.O., T.K.; Writing - D.P.Y., E.S.O., S.N., T.K., F.D.A., P.O.K.; Critical Review - D.P.Y., E.S.O., S.N., T.K., F.D.A., P.O.K.

REFERENCES

1. King TE Jr, Lee JS. Cryptogenic Organizing Pneumonia. N Engl J Med 2022; 386:1058-69. [CrossRef]
2. Cherian SV, Patel D, Machnicki S, Naidich D, Stover D, Travis WD, et al. Algorithmic Approach to the Diagnosis of Organizing Pneumonia: A Correlation of Clinical, Radiologic, and Pathologic Features. Chest 2022; 162:156-78. [CrossRef]
3. Cordier JF. Cryptogenic Organizing Pneumonia. Eur Respir J 2006;28: 422-46. [CrossRef]
4. Epler GR. Bronchiolitis Obliterans Organizing Pneumonia. Arch Intern Med 2001; 161:158-64. [CrossRef]
5. Vasu TS, Cavallazzi R, Hirani A, Sharma D, Weibel SB, Kane GC. Clinical and Radiologic Distinctions between Secondary Bronchiolitis Obliterans Organizing Pneumonia and Cryptogenic Organizing Pneumonia. Respir Care 2009; 54:1028-32.
6. Romero S, Barroso E, Rodriguez-Paniagua M, Aranda FI. Organizing Pneumonia Adjacent to Lung Cancer: Frequency and Clinico-Pathologic Features. Lung Cancer 2002; 35:195-201. [CrossRef]
7. Song J, Gorgan L, Corkey R, Kwa SL. An Unusual Case of Bronchiolitis Obliterans Organizing Pneumonia Concomitant with Bronchioloalveolar Carcinoma. Respiration 2004; 71:95-7. [CrossRef]
8. Huaringa A, Haro M, Figueroa J, Ro J. Bronchiolitis Obliterans Organizing Pneumonia in Cancer Patients. The Internet Journal of Pulmonary Medicine. 2004 Volume 4 Number 2. [CrossRef]