# An elderly male with nonresolving consolidation

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## ABSTRACT

An 81-year-old male presented with a background history of progressive shortness of breath for 3 years with recent worsening in the past 6 months. Clinicoradiological investigations were consistent with a nonresolving consolidation involving predominantly right lung. This clinicopathologic conference discusses the differential diagnoses of pneumonia of long-standing duration and their management options.

**KEY WORDS:** Mucosa-associated lymphoid tissue lymphoma, nonresolving consolidation, pulmonary

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## PRESENTATION OF THE CASE

### Dr. Hariharan Iyer

An 81-year-old male presented to the pulmonary department with shortness of breath for the past 3 years, which worsened in the past 6 months. He denied a history of orthopnea, paroxysmal nocturnal dyspnea, swelling over the feet, cough, fever, and loss of appetite or weight. He had a history of coronary artery disease and hypertension which were managed well with oral medications. He was a lifetime nonsmoker with no significant family history or any exposure to noxious fumes, pets/birds. Physical examination was unremarkable, and his room air saturation was 95%; however, breath sounds were reduced in the right infraclavicular and mammary areas.

He was initially evaluated at an outside hospital, diagnosed with pleural effusion, and treated with a course of antitubercular medicines on clinicoradiological basis. His pleural fluid was negative for malignant cells. In view of persistent symptoms, a computed tomography (CT) scan of the thorax was done at another hospital which showed dense consolidation in the right upper and middle lobes with patchy consolidation in the left upper lobe [Figure 1a]. The patient, however, did not follow up in that center and presented to our department after a year with persistent symptoms. A repeat CT scan of the thorax revealed persistence of the consolidation [Figure 1b]; a positron emission tomography scan was done, which was suggestive of metabolically active consolidation in the right lung

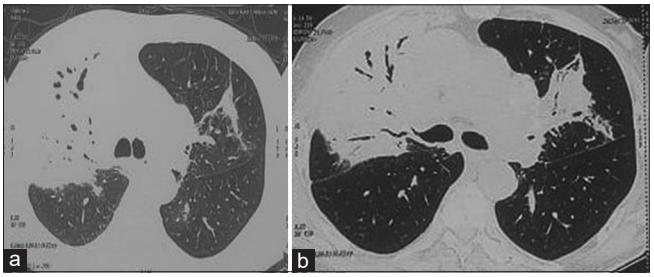


**Figure 1:** (a) Lung window images of computed tomography chest (2018). (b) Lung window images of computed tomography chest (2019)

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with a diffuse solid component and adjacent part showing air bronchograms with metabolically active anterior diaphragmatic and mediastinal lymph nodes [Figure 2]. Flexible bronchoscopy was performed [Figure 3], which revealed mucosal infiltration of the right middle lobe and edematous right lower lobe opening; multiple endobronchial biopsy samples were obtained from the abnormal areas.

## CLINICAL DISCUSSION: SALIENT FEATURES OF THE CASE AND DIFFERENTIAL DIAGNOSIS

### Dr. Anant Mohan

This patient is an elderly, nonsmoker male with a nonresolving consolidation in bilateral lungs with predominance on the right side. The differential diagnosis includes neoplastic causes such as bronchogenic carcinoma, bronchioloalveolar carcinoma, atypical carcinoid, pulmonary lymphoma, or infective causes such as pneumonia caused by organisms such as *Mycobacterium*, fungus, and *Nocardia*. Certain inflammatory conditions such as cryptogenic organizing pneumonia, granulomatosis with polyangiitis, and eosinophilic pneumonias can also present with a nonresolving pneumonia; however, the clinicoradiological profile of these disorders does not fit with the presentation of the present case. Another important differential diagnosis which is frequently overlooked in this age group is aspiration of a foreign body such as dentures leading to endobronchial obstruction and causing a nonresolving pneumonia. However, a flexible bronchoscopy ruled out any such possibility.

Considering the advanced age, long-standing history, with the absence of constitutional symptoms and the presence of metabolically active consolidation and mediastinal nodes, a diagnosis of malignancy is favored over infective causes.

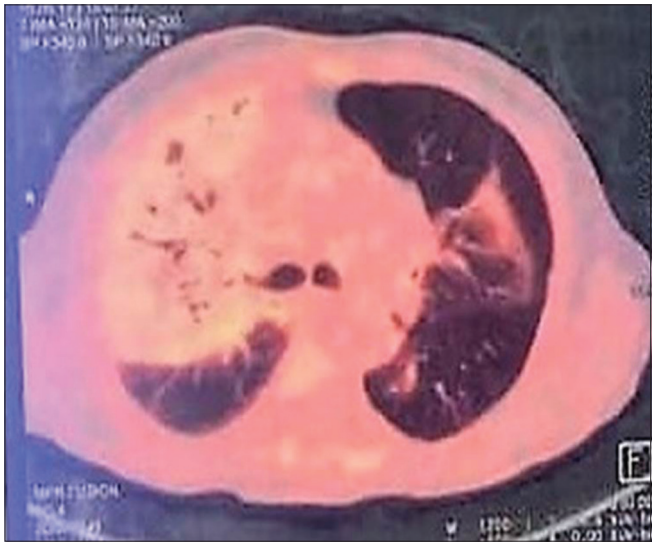

**Figure 2:** Positron emission tomography–computed tomography showing metabolically active consolidation in the right lung

We would like to review the differential diagnoses of various neoplastic and nonneoplastic etiologies presenting with a nonresolving pneumonia.

### Dr. Hariharan Iyer

#### *Bronchogenic carcinoma*

Bronchogenic carcinoma can cause bronchial compression either by endobronchial involvement or due to extrinsic pressure, thereby causing postobstructive pneumonia due to failure of clearance of secretions and subsequent infection.[1] Bronchogenic carcinoma as a cause of nonresolving pneumonia is reported in up to 26% of cases.[2] Both squamous cell carcinoma and adenocarcinoma are implicated to be causes of nonresolving pneumonia. Squamous cell carcinoma probably scores over adenocarcinoma due to its central location, whereas adenocarcinomas usually are peripherally located. Although both these tumors are usually associated with smoking, lung malignancy is well known in nonsmokers as well. Furthermore, the bronchoscopic abnormalities suggest an endobronchial involvement, and hence, this possibility is strongly considered at this point.

#### *Bronchioloalveolar carcinoma*

Bronchioloalveolar carcinoma is a subtype of adenocarcinoma. Currently, it is referred to as invasive mucinous adenocarcinoma. This morphological type has varied clinical presentations ranging from solitary nodule to a lobar consolidation or a diffuse infiltrate. In view of its relatively slow growth, this tumor can remain undiagnosed for a long time.[3]

#### *Lymphoma*

Lymphoma can involve the lung either as a part of systemic disease or as a primary pulmonary lymphoma. Both the major varieties, i.e., low-grade B-cell lymphoma arising from mucosal tissue (mucosa-associated lymphoid tissue [MALT]) and high-grade diffuse large B-cell lymphoma, commonly involve the lung and can present with nonresolving consolidation. However, primary

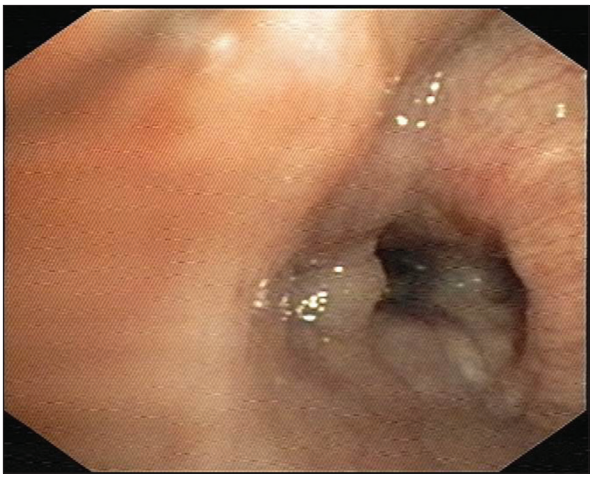

**Figure 3:** Bronchoscopic image showing mucosal edema and infiltration in the right middle lobe

pulmonary lymphoma is very rare, with only 10% of Hodgkin lymphomas and 4% of non-Hodgkin lymphomas presenting with an alveolar infiltrate. It is notable that these are relatively slow-growing tumors, and the interval between clinicoradiological manifestations and diagnosis can be as long as 8 years.[4] Although a relatively rare diagnosis, it remains a consideration in this particular patient.

### *Infectious causes of nonresolving consolidation*

Tuberculosis is one of the important differentials of nonresolving consolidation, especially in endemic countries such as India. It is reported that up to 16% of cases of nonresolving pneumonia can be attributed to tuberculosis.[2] Atypical presentations are especially common in older and immunocompromised individuals. Similarly, infection with other pathogens such as *Nocardia* and actinomycetes may lead to pneumonia with cavities and propensity to extend across the lung fissures. In one series, <7% of the cases were diagnosed correctly on admission with actinomycosis, with the average duration of the illness before definite diagnosis being around 6 months.[5]

## CLINICAL DIAGNOSIS

Non-resolving pneumonia likely due to neoplastic etiology.

**Dr. Anant Mohan**

With these clinical possibilities, can we have the histopathological evaluation of the specimen?

**Dr. Saumyaranjan Mallick**

Histopathological examination of the endobronchial biopsy revealed multiple mucosal fragments with focal areas of ulceration. Subepithelium showed diffuse infiltration by small atypical lymphoid cells which are diffusely immunopositive for CD20 while negative for CD3, CD23, CD5, cyclin D1, CD10, CK, and synaptophysin [Figure 4]. Ki67 labeling index is 10%. These morphological features are suggestive of MALT lymphoma.

Pathological diagnosis: Pulmonary MALT lymphoma.

Final diagnosis: Pulmonary MALT lymphoma.

**Dr. Anant Mohan**

Isolated pulmonary lymphoma is very rare (0.5%–1% of all extranodal localization). It develops more often in the sixth and seventh decades of life in men as often as women.[6]

MALT lymphoma is the most frequent subset of primary pulmonary lymphomas and accounts for 90% of primary pulmonary lymphomas.[7] MALT lymphoma is a low-grade B-cell extranodal lymphoma that is characterized by a proliferation of clonal marginal zone lymphocytes which invade epithelial structures and form characteristic lymphoepithelial lesions.

In approximately 36% of cases, patients are asymptomatic at the time of diagnosis. The common symptoms include dry cough, chest pain, exertional dyspnea, fatigue, weight loss, fever, and night sweats.[8] The median duration between the onset of symptoms or radiological abnormalities and achieving a diagnosis is approximately 9 months, with a significantly longer duration required for diagnosis in asymptomatic individuals. About 15% of patients with primary pulmonary lymphoma have associated autoimmune diseases such as systemic lupus erythematosus, rheumatoid arthritis, or Sjögren's syndrome.[9]

The diagnosis of pulmonary MALT lymphoma is based on a combination of histopathological findings and immunohistochemistry, gene rearrangement studies, cell marker studies, and molecular techniques. In the absence of endobronchial involvement, bronchoalveolar lavage can be useful, if the fluid reveals a lymphocyte rate >20% of

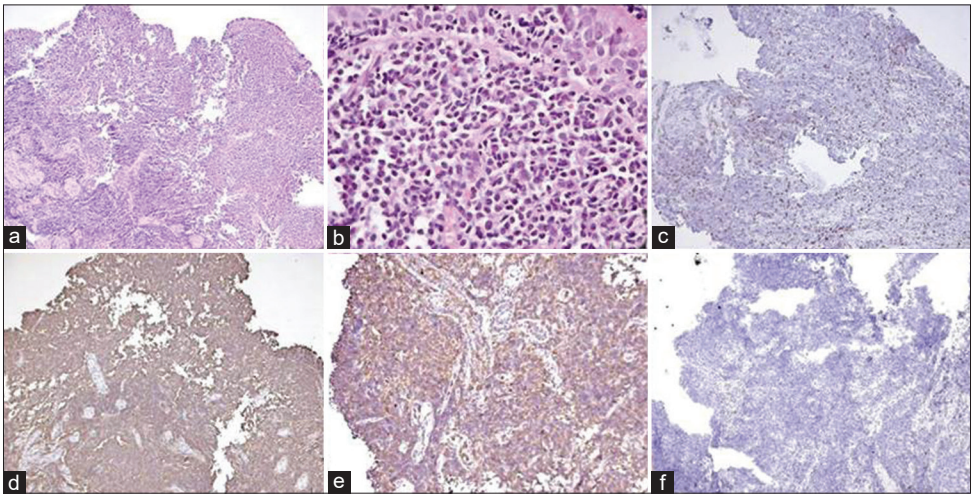


**Figure 4:** Microphotograph shows respiratory lined mucosa with dense infiltration of submucosa by small-sized lymphoid cells. (a) H and E, ×40, (b) H and E, ×200 lymphocytes are immunopositive for CD20 (d) ×100, CD43 (e) ×100 while negative for CD3 (c) ×100 and cyclin D1 (f) ×100

total cells and >10% of them are B-cells (especially with clonal gene rearrangement).[10]

## MANAGEMENT AND PROGNOSIS

### Dr. Kutty Sharada Vinod

There is no unified treatment strategy for MALT lymphoma. At present, treatment options are surgery or radiotherapy for localized lymphoma and chemotherapy with or without the anti-CD20 monoclonal antibody for disseminated lymphoma.

Asymptomatic patients may be subjected to a watch-and-wait policy rather than immediate aggressive therapy, because spontaneous regression has been documented. In a series of 11 patients with pulmonary MALT lymphoma, who were only observed, without any definite treatment following diagnosis, there was no progression in the disease for a median duration of 28 months. Six of these patients also had a spontaneous regression.[11]

In symptomatic patients, chlorambucil-based chemotherapy with or without immunotherapy with the anti-CD20 antibody–drug, i.e., rituximab, is recommended. There is a paucity of data to recommend the superiority of one drug over the other.[12]

The overall reported 5-year and 10-year survival rates of pulmonary MALT lymphoma are 90% and 72%, respectively.[9] No difference in survival rates has been observed between gastrointestinal and nongastrointestinal lymphoma or between localized versus disseminated disease. However, relapses are more frequent in patients with nongastric localizations. Advanced age and low economic status have been found to be two negative prognostic factors for survival. The median time to relapse is 47 months. In view of the high relapse rate of around 37%, patients with MALT lymphoma should be kept under long-term observation.[13] Follow-up visits at 3–6 monthly intervals are recommended.[13]

## SUMMARY

This case tracks the long clinical course of a nonresolving pneumonia and highlights the importance of thorough investigation so as to pick up indolent malignant disorders early and offer longer curative benefits. Routine surveillance is necessary in such cases after initiation of therapy to detect relapses.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that their name and initial will not be published, and due to efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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