Nodular lymphoid hyperplasia of the lung: the role of positron emission tomography in diagnosis

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ÖZET

Akciğerin nodüler lenfoid hiperplazisi: Tanıda pozitron emisyon tomografının rolü


Anahtar Kelimeler: Hemoptizi, kaviter lezyon, PET, akciğerin nodüler lenfoid hiperplazisi.

SUMMARY

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Pulmonary nodular lymphoid hyperplasia (NLH) is defined as reactive lymphoid proliferation forming solitary or multiple nodules or localized infiltrates localized in the lungs. Radiological presentations are generally solitary or multiple nodules, but air bronchograms and ground glass attenuation may be present. Patients mostly asymptomatic and the lesions were detected coincidentally on routine chest X-rays. We present a case of NLH with cavitary lesion arising in the lung of a 61 year-old man who admitted with cough and massive hemoptysis. The lesion had positive fluorodeoxyglucose (FDG) uptake. To our knowledge, this is the only patient reported in the literature presenting with massive hemoptysis and a cavitary lesion with positive FDG uptake.

**Key Words:** Hemoptysis, cavitary lesion, PET, nodular lymphoid hyperplasia of the lung.

CASE REPORT

A 61-year-old immunocompetent patient was admitted to our hospital with cough and hemoptysis in the last month. He was a heavy smoker without a history of tuberculosis. Physical examination was unremarkable. Chest X-ray demonstrated a mass located in the right middle zone. Thorax computerized tomography (CT) revealed a cavitary pulmonary mass localized to the superior segment of right lower lobe (Figure 1). In further evaluation of the patient with bronchoscopy, endobronchial lesion could not be detected. The histopathological assessments of bronchoalveolar lavage, brush and aspiration fluid were benign, and the smear was negative.
for tuberculosis. A second bronchoscopy to re-
ach the diagnosis was uneventful. A transthorac-
ic needle aspiration of the mass revealed
ymphocytes and leucocytes without an eviden-
ce of malignancy. Regarding the high prevalen-
ce in our country, antituberculosis therapy was
iated although the smear was negative for tu-
berculosis. Four months later, he was referred
from the local tuberculosis dispensary to our cli-
ic with massive hemoptysis. Thorax CT de-
nemonstrated the same characteristics of the for-
erm lesion. Antituberculosis therapy was stop-
ded, due to the negative cultures for sputum and
bronchoscopic materials. Vasculitic syndromes
such as Wegener’s granulomatosis were suspec-
ted in the presence of an unidentified cavitary
esion. Myeloperoxidase and antiproteinase AN-
CA were negative. FDG-positron emission to-
mography (PET) standard uptake value was po-
sitive (SUV: 4.1), indicating malignancy or in-
fecion (Figure 2). There was not any pathologi-
cal FDG uptake in the other parts of the body.
An open lung biopsy confirmed the final diagno-
sis as NLH. The histologic examination was po-
sitive for CD3, CD20 and leukocyte common
agent (LCA) and negative for keratin (Figure
3). The patient was decided to be followed wit-
out resection. He is still stable with no exacer-
bation after the first year.

**DISCUSSION**

Pulmonary lymphoid lesions are inflammatory
and reactive, which clinicians face difficulties
in differential diagnosis of other reactive path-
ologies and malignancies. Formerly, nodular
ymphoid proliferations were accepted as be-
nign lesions, and Sultztein proposed the term
“pseudolymphoma” to describe reactive loca-
zied masses of lymphoid tissue in the lung
(3). However, it was shown that many of the
pseudolymphomas were diagnosed as “muco-
sa associated lymphoid tissue lymphoma
(MALT lymphoma)”, and the impression emer-
ged that most cases with pseudolymphomas
could be classified as malignant lymphomas
(4). The nomenclature was changed through-
ut the time. Kradin and Mark described the le-
sion as benign in 1983. And finally, World He-
alth Organization (WHO) and International As-
sociation for the Study of Lung Cancer accep-
ted the term NLH instead of pseudolymphoma in
1999 (5). A clinicopathological study by Ab-
bondanzo et al. reevaluated 14 cases with NLH
by using modern immunohistochemical and
molecular techniques, and their findings rein-
fected that this entity could be classified as a
subgroup among the reactive pulmonary lesi-
ones (6).

NLH shows a slight increase in female gender.
Patients range from 19 to 65 though majority of
them cumulate between ages 50 and 65. They
are mostly asymptomatic, only one third of
them present with symptoms like shortness of
breath, cough and/or pleuritic chest pain (6).

In asymptomatic patients the lesions are detec-
ted coincidentally on routine chest X-rays. Radi-
ographically NLH mostly presents as a solitary
pulmonary nodule, though two or three nodules
are found in %36 of patients (6). On CT the no-
dules are generally discrete, but ill defined nodu-
lar opacities may also be present. Nodules
which are mostly located in the subpleural area
may range from 0.6 to 6 cm (mean: 2.1 cm) in
size, air bronchograms and ground glass attenu-
ation are the other radiological presentations re-
ported less frequently (2,6). Our patient was ad-
mitted to our hospital with hemoptysis and the-
ere was a cavitary lesion located in subpleural
region. To the best of our knowledge, this is the
only patient presenting with hemoptysis and a
cavitary lesion reported in the literature.

The histological features of NLH are well defi-
ned. A well demarcated nodule contains a reac-
tive germinal center, sheets of interfollicular ma-
ture plasma cells; well preserved mantle zones
om some containing Russell bodies without follicular
colonization. Immunohistochemical findings re-
veal positivity for antibodies CD20, CD3, CD5,
CD43 and CD45RA, and negative for BCL-1. The
immunoglobulin light chain reactivity is polyclo-
nal, whereas it is monoclonal in MALT lympho-
ma (6). The primary differential diagnosis of
NLH should include MALT lymphoma. Primary
non-Hodgkin’s lymphoma in the lungs is very
rare, and the most common is mucosa-associ-
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Figure 2. FDG-PET the lesion’s standard uptake value was positive (SUV: 4.1).

Figure 3. A. Multiple lymphoid clusters in sclerotic ground (HE x4) B. Nodular lymphoid hyperplasia with hematoxylen eosin staining (HE x20) C. CD3 positivity in nodular lymphoid hyperplasia (CD3 x20) D. CD20 positivity in nodular lymphoid hyperplasia (CD20 x20).
ated lymphoid tissue lymphoma (MALToma), that arises from bronchial mucosa-associated lymphoid tissue. The appearance of MALT lymphoma on chest X-ray is highly heterogeneous. It may be a mass, single or multiple nodules or even a pleural effusion, or it may have a bronchiectasis-like appearance (7). Preoperative diagnosis is mostly difficult and it can be made only by pathological examination. Regarding our case, which presented with hemoptysis and a cavitary mass lesion, the differential diagnosis should include malignancies, vasculitic syndromes and tuberculosis.

PET has become very popular in diagnosing lung cancer, and it is reported to have a sensitivity of 79-89%, a specificity of 82-92%, positive predictive value of 40-100%, and a negative predictive value of 75-100% (8-10). PET scanning using injected 18F-fluorodeoxyglucose provides visual and quantitative information for the rate at which glucose is taken up by the lung. The CT scan gives highly accurate density and anatomic information to locate areas of inflammation seen on the PET scan, increasing the accuracy of the interpretation. With regard to organ involvement, PET/CT and contrast-enhanced CT are found to have a sensitivity of, 88% and 50%, and a specificity of 100% and 90%, respectively. Regarding the exclusion of disease, some reporters have concluded that the, PET/CT performed significantly better than contrast-enhanced CT (11). Recently, it has been reported that PET/CT appears to provide relevant information in the staging, therapy and also monitoring of patients with MALT lymphoma (12). PET has shown to be positive in this case. To best of our knowledge, it is the first case with nodular lymphoid hyperplasia with positive FDG uptake.

Although there is no standardized treatment for NLH, resection of the lesion has been suggested. The prognosis is excellent; no recurrence has been detected in patients followed up to 6 years (6). Our patient is also in good clinical condition with no symptoms, and the lesion is stable after one year.

In conclusion; nodular lymphoid hyperplasia, though very rare, should be kept in mind in the differential diagnosis of the cavitary mass lesions with positive FDG uptake.

REFERENCES