Pulmonary Placental Transmogrification Presenting as a Small Lung Nodule

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Pulmonary placental transmogrification (PT) is a rare lung disease that takes on the histologic appearance of placental chorionic villi. We herein report a case of PT in a 66-year-old woman who presented with a single nodule on chest radiography performed during a routine health examination. She had no complaints of any symptoms. Chest radiography showed a focal ill-defined nodular opacity in the right lower lobe; chest computed tomography revealed a 17-mm lobulated, focal irregular mass with fissural retraction in the right lower lobe, suggestive of lung cancer. Pathology of a percutaneous needle aspiration biopsy revealed papillary structures resembling placental villi. These were lined by cytotrophoblast-like cells and syncytiotrophoblasts. This characteristic pathologic finding led to a diagnosis of PT. PT of the lung is found mainly in bullous or cystic lesions. However, this patient presented with a single nodule on chest radiography. (Korean J Med 2016;90:144-147)

Keywords: Neoplasm, Lung; Placenta; Chorionic villi

INTRODUCTION

Pulmonary placental transmogrification (PT) is a rare benign lesion first described by McChesney in 1979 [1]. PT is defined as placental villi-like papillary structures in the lung parenchyma; however, this tissue contains no biological components of the placenta despite the morphological similarity [2]. It is composed of epithelial cells, proliferating vessels, inflammatory cells, and fat. Disease pathology is characterized by the formation of papillary structures similar to placental villi surrounding the pulmonary epithelium [3,4]. Radiologically, PT of the lung shows mainly bullous changes [4]. Although many hypotheses have been proposed to describe the pathogenesis of PT, the evidence remains unclear [3,5]. We herein report a case of PT in a 66-year-old woman who presented with a single nodule.
CASE REPORT

A 66-year-old woman presented with a small nodular lesion on chest radiography performed during a routine health examination. She did not complain of respiratory or systemic symptoms. She was a nonsmoker with well-controlled diabetes and hypertension over a 10-year period. There was no other notable familial or occupational history. Physical examination and laboratory tests were unremarkable, and no acid-fast bacilli were detected on sputum culture. Chest radiography showed a focal ill-defined nodular opacity in the right lower lobe zone (Fig. 1). Chest computed tomography (CT) revealed a 17-mm lobulated and focal irregular mass with fissural retraction in the right lower lobe anterobasal segment of the lung, suggestive of lung cancer such as adenocarcinoma in situ (Fig. 2A and B), and two other lung nodules (<5 mm) in the right upper lobe anterior segment and right lower lobe superior segment (Fig. 2C and D). There were
Figure 3. Microscopic examination showed papillary structures and normal keratinizing squamous epithelial tissue in the biopsy specimen. The papillary structure was covered by cytotrophoblasts and syncytiotrophoblasts with an edematous core (A, B) (hematoxylin and eosin (H&E) stain, ×40, ×200). The papillary projections showed immunoreactivity for β-hCG (×100) (C), but no reactivity for TTF-1 (×100) (D).

no contralateral nodules, enlarged lymph nodes, or effusions. Pulmonary function testing showed a forced expiratory volume during 1 second (FEV₁) of 1.89 L (90% of the predicted value), a forced vital capacity (FVC) of 2.69 L (96% of the predicted value), and a diffusion capacity of carbon monoxide of 20.6 mL/mm Hg/min (132% of the predicted value). The FEV₁/FVC ratio was 0.70.

A CT-guided percutaneous needle aspiration biopsy of the right lung nodule was performed for histological confirmation. The two smaller nodules could not be characterized. Because the biopsy was not performed due to their small size and location; regular follow-up CT was planned to monitor these lesions. Microscopy revealed a papillary structure resembling chorionic villi on scanner view (Fig. 3A). The papillary projection was lined by cytotrophoblast-like cells with a single nucleus and basophilic cytoplasm and syncytiotrophoblasts with multiple small nuclei and eosinophilic cytoplasm. An edematous stroma with bland ovoid interstitial cells was evident (Fig. 3B). The cells of the papillary structure were strongly positive for β-hCG (Fig. 3C), but negative for TTF-1 (Fig. 3D). These characteristic histological and immunohistochemical findings led to a diagnosis of PT of the lung. The patient did not complain of symptoms, and there was no interval difference on chest radiography and chest CT during the 1-year follow-up after the diagnosis.

DISCUSSION

PT of the lung is a rare disease that has been adequately documented in only 30 cases [4]. Clinically, this disease typically occurs in men aged 20 to 50 years and usually presents with dyspnea or pneumothorax [4,6]. We have herein presented a rare case of PT in an asymptomatic woman who presented with a single nodule. Most reported cases of PT are accompanied by emphysema and symptoms associated with pneumothorax, requiring pneumonectomy. Ferretti et al. [3] documented a case of PT presenting as a 25 mm pulmonary nodule without
associated bullous emphysema. Our case is similar to that re-
ported by Ferretti et al. [3] which involved a 17-mm nodule and
no associated emphysema. Early diagnosis is important because
PT requires surgical resection.

Cavazza et al. [7,8] suggested that PT may not be a variant
giant bullous emphysema, but an interstitial clear cell prolif-
eration with secondary emphysema-like cystic change. In
addition, they analyzed the immunophenotype of these clear cells
and found them to be positive for CD10 and vimentin but neg-
ative for cytokeratin, actin, desmin, and S-100. In our case, in-
terstitial clear cell proliferation was observed without emphyse-
ma-like cystic change, suggesting that PT may be associated
with proliferation of lining epithelial components in the ham-
martomas, as suggested by Cavazza et al. [7].

Patients diagnosed with PT may remain asymptomatic for
years before presenting with chest pain, dyspnea, or hemoptysis
[7]. Thus, PT presents in many forms, from asymptomatic to
clinically symptomatic associated with other pulmonary diseases,
such as chronic obstructive pulmonary disease, repeated pneu-
mothorax, and even respiratory distress [5,7]. Xu et al. [9] docu-
mented the frequent association of PT with pulmonary fi-
brochondromatous hamartomas and suggested that it may be in-
duced by, or associated with, proliferation of lining epithelial
components of the hamartomas. Therefore, this lesion may occur
with non-cystic lung lesions such as fibrochondromatous ha-
martoma or as a solitary pulmonary nodule on routine chest im-
ages, as in our case. PT is considered benign, but a case of pap-
illary adenocarcinoma arising in a placentoid bullous lesion has
been reported [7]. Surgical resection is commonly curative and
improves lung function and quality of life [7]. In our case, the
patient had no respiratory complaints and there was no sig-
ificant difference on follow-up chest CT. She has been advised
of the possibility of changes in malignancy and is scheduled for
regular outpatient follow-up visits.

In conclusion, PT is a rare pulmonary disease characterized
by papillary structures similar to placental villi surrounding the
pulmonary epithelium. Prior to diagnosis, most patients exhibit
symptoms of severe emphysema or pneumothorax, but our pa-
tient had no symptoms. This case shows that PT may be found
as an incidental solitary pulmonary nodule on routine health ex-
amination, not as an emphysema-like cystic lesion. Patients who
are left untreated upon diagnosis of PT often proceed to suffer
severe complications such as bullous emphysema, recurrent pneu-
mothorax, or tension pneumothorax. Thus, early diagnosis and
close follow-up is critical, as in our case.

중심 단어: 폐의 신생물; 태반; 융모막융모

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