

Primary Pulmonary Paraganglioma: A Case Report

Primer Pulmoner Paraganglioma: Olgu Sunumu

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Abstract

Primary Pulmonary Paraganglioma (PPP) is an uncommon neuroendocrine tumor of the lung. We present the case of an asymptomatic 36-year-old female with a solid, round, mass 4.0 cm in diameter in the lower lobe of right lung. Encapsulated mass was excised and pathologic examination revealed paraganglioma. The diagnosis and treatment of PPP is discussed in relation to the relevant literature. *Türk Jem 2010; 14: 14-6*

Key words: Primary pulmonary paraganglioma, neuroendocrine tumor, lung mass

Özet

Primer pulmoner paraganglioma (PPP), akciğer de nadir olarak görülen bir tümördür. Sağ akciğer alt lobda 4 cm çapında solid kitle tespit edilerek kliniğimize yönlendirilen herhangi bir semptomu olmayan 36 yaşındaki kadın hastayı sunmaktayız. Hastanın kapsüle subplevral kitlesi çıkartılıp patolojik incelemesi yapıldığında paraganglioma olduğu anlaşıldı. Nadir görülen bu primer pulmoner paraganglioma olgusuyla, hastalığın tanı ve tedavisi ilgili literatürler eşliğinde tartışılmıştır. *Türk Jem 2010; 14: 14-6*

Anahtar kelimeler: Primer pulmoner paraganglioma, nöroendokrin tümör, akciğer kitlesi

Introduction

Extra-adrenal paragangliomas arising from neuroectodermal-derived paraganglion tissue are uncommon tumors (1). These low-grade tumors frequently occur in the superior and inferior para-aortic region, but they have also been reported in a variety of uncommon locations, including the lung parenchyma. Both solitary and diffuse primary pulmonary paraganglioma (PPP) have been reported in the lung. Heppleston first described PPP in 1958 (2) and we reviewed 22 other cases of PPP reported in the literature.

Case Report

A 36-year-old female was admitted to the Thoracic Surgery Department because of a lung lesion, which had been found incidentally on a routine chest roentgenogram. The patient

was asymptomatic. The chest roentgenogram showed a homogeneous well-circumscribed solid mass 4.0 cm in diameter centrally located at the right mid-lower lung field (Figure 1A). Computed tomography (CT) findings confirmed a solid round mass without contrast media staining (Figure 1B). Posterolateral thoracotomy was performed via fifth intercostal space. Reddish, solid, homogeneous, encapsulated, round mass was found in the basal segment of the lower lobe. It was slightly adherent to the lower branches of interlobar pulmonary artery. Frozen section study revealed benign lesion and mass encapsulation gave the well-defined surgical margins providing easily and total excision of it.

Pathologic examination revealed paraganglioma. On further histological examination, the tumor was observed to be hypercellular, with well-defined nests of cuboidal cells ("zellballen pattern") separated by highly vascularized fibrous septae (Figure 2A). The individual cells had a moderately abundant

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granular cytoplasm and round-to-oval nuclei with speckled chromatin. Conspicuous nucleoli were noted. Mitosis was observed to be absent. The nests of cuboidal cells were surrounded by satellite spindle sustentacular cells. Chief cells were intensely positive for neuro-endocrine markers such as chromogranin A (Figure 2B), synaptophysin. Sustentacular cells were positive for S-100 protein (Figure 2C), but negative for high molecular cytokeratins, monoclonal CEA.

Postoperative inspection of the adrenal glands and cervical region did not show any other lesions. The patient was discharged 7 days after the operation and a follow-up examination after 24 months, including whole-body CT and MIBG (iodine-131-meta-iodobenzylguanidine), showed no evidence of recurrence or metastatic finding.

Discussion

The normal paraganglia consists of nests of chief cells (type1) and sustentacular cells (type 2). Chief cells contain numerous dense-cored neurosecretory granules thought to contain catecholamines. Two types of paraganglioma have been reported: the former form is multiple miliary tumors, which occur with chronic lung diseases and may be found in 3.0% of the normal population at autopsy and these tumors are probably arising due to ischemic conditions stimulating the preexisting paraganglionic cells by small pulmonary emboli (3). The later form is parenchymal or subpleural solid tumor, as it was in our case. According to the WHO classification, they are tumors belonging to the group of parasympathetic (non-chromaffin) branchiomic paragangliomas, known as chemodectomas (1). Pulmonary paraganglia are identified proximity to blood vessels and nerves and frequently located to the branching pulmonary artery (4).

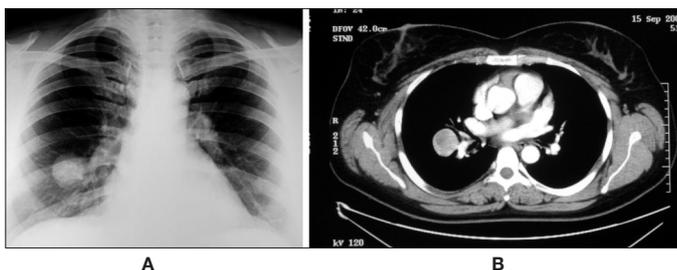


Figure 1. (A) Well-circumscribed homogeneous mass centrally located at the mid-lower lung field, **(B)** Computed tomography shows solid mass with intimate relationship to the pulmonary artery

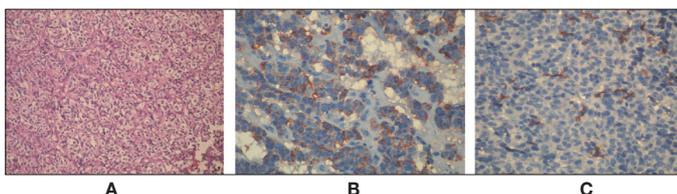


Figure 2. (A) Well-defined nests of cuboidal cells ("zellballen pattern") (H.Ex50), **(B)** Intense immunohistochemical positivity for chromogranin chief cells, **(C)** The "zellballen" are surrounded by S-100 protein positive sustentacular cells

As in most cases reported, the tumor in our case was seen to have intimate relationship to the major pulmonary vessels. Some authors have used this definition for diagnosing PPP and distinguishing it from carcinoid tumors. According to them, a tumor which is intimately related to the pulmonary artery or its tributation and absence of PPP with endobronchial origin should be taken into consideration (5-7). Our operative findings also confirm this definition.

PPP usually presents as asymptomatic nodules, coin lesions or like in our case, as a non-functioning solitary mass. Some of these patients were asymptomatic with a mass being found incidentally on routine chest reontgenogram. Symptoms are usually related to catecholamine excess or local expansion of the mass (8). In a few cases, mild or transient elevation of blood pressure was observed, but etiology remains unclear (3,7). In some cases, the symptoms are related to obstruction of the bronchial tree leading to pneumonia and respiratory symptoms (2). Surgical intervention may vary from enucleation to pneumonectomy (3,7). As histological appearance is not sufficient to discriminate between benign and malign types, lymph node metastasis seems to warrant a diagnosis of malign PPP. Malign PPP is uncommon, with only four cases having been reported (3,5,8,9). Extensive resections of malign cases are not justified, except for the tumor location (3,7,9). Although unresected local invasion of the brachial plexus was observed in one case, a ten-year follow-up showed no evidence of recurrence (10). Tumor-related death has not been reported.

Differential diagnosis between carcinoid tumors including bronchial carcinoids and paraganglioma is difficult as they may show similar appearance. The characteristic cell nests surrounded by highly vascularized stroma ("zellballen pattern") support the diagnosis of paraganglioma. The presence of S-100 protein-reactive sustentacular cells supports this diagnosis, although the presence of these cells has been demonstrated in some bronchial carcinoid tumors. The presence of neurosecretory granules does not permit a distinction between paraganglioma and bronchial carcinoid tumors. Cytokeratin can aid in the distinction between a PPP and a carcinoid, but is not absolutely diagnostic (1,11).

According to Aubertine et.al., some of the reported cases are problematic as they lack illustrations or illustrations that are more compatible with carcinoid tumors than paragangliomas are based upon positive staining for cytokeratin (1).

The tumor in our case was diagnosed as PPP due to the observation of a diffuse zellballen pattern throughout the tumor, the absence of classic carcinoid tumor architecture, the presence of distinctive cytoplasmic vacuoles, a negative immunohistochemical staining for cytokeratin. Furthermore, the exclusion of an extrapulmonary paraganglioma or pheochromocytoma confirms the case as PPP (1,11).

PPP seems to have an indolent manner when compared to intra-abdominal extra-adrenal paragangliomas. Collective experience does not justify extensive resections and the discrimination between a PPP and carcinoid tumor is necessary.

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