INTRODUCTION

Sclerosing hemangioma is relatively rare, the second most common benign pulmonary neoplasm, which usually presents the peripheral location. Central location of this neoplasm is extremely rare with only a few reports. Herein, we would like to report an extremely rare case of central sclerosing hemangioma with descriptions of radiological characteristics. It was initially misdiagnosed as a papillary adenoma by bronchoscopic biopsy and mimicked central lung malignancies such as carcinoid tumors on non-invasive image evaluations. However, the patient was finally confirmed with surgery.

Index terms
Sclerosing Hemangioma
Pneumocytoma
Endobronchial
Pulmonary Neoplasm

CASE REPORT

A solitary lung mass with central location in right upper lobe was discovered in 58-year-old female without specific symptoms. The initial chest PA radiograph showed about 3 cm sized nodular opacity in the right hilar area (Fig. 1A), and the initial chest CT revealed a well-defined centrally located mass of about 3 cm diameter, and heterogeneous contrast enhancement in the
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J Korean Soc Radiol 2013;69(4):283-286

right upper lobe (RUL) abutting the posterior segmental bronchus (Fig. 1B). There was no evidence of infiltration on the surrounding lung parenchyma or lymphadenopathy. Bronchoscopically, there was an endobronchial lesion obliterating posterior segmental bronchus of RUL with easy touch bleeding, and the bronchoscopic suspicion was a carcinoid tumor (Fig. 1C). The pathologic result of initial bronchoscopic biopsy was a papillary adenoma (Fig. 1D).

However, the serial of follow-up chest CT scans show gradual increases of the mass with small endobronchial portion. The last follow-up CT scan obtained 7 years after the initial exam indicated about 1.1 cm interval growth of central mass in the posterior segment of RUL with ice-burg sign. The large extraluminal portion with relatively small endobronchial portion is known as a typical radiologic finding of slow growing central carcinoid tumor (3), with newly developed distal obstructive pneumonitis and subsegmental atelectasis (Fig. 1E). The follow-up positron emission tomography-CT (PET-CT) scan also revealed high fluorodeoxyglucose (FDG) uptakes of the mass [maximal standardized uptake value (SUV<sub>max</sub>): 5.8] (Fig. 1F). These image findings suggested a slow growing low grade central lung malignancy with some hypervascularity such as a carcinoid tumor rather than benign neoplasm. For accurate diagnosis and treatment, the patient underwent posterior segmentectomy of the RUL, and the mass was completely removed. The mass showed papillary, hemorrhagic, and sclerotic pattern composed of surface cuboidal cells and sheets of round cells (Fig. 1G). There was no necrosis or mitotic figures. On the immunohistochemical stains, surface cuboidal cells were positive for cytokeratin (CK), epithelial membrane antigen (EMA), and thyroid transcription factor-1 (TTF-1), but round cells were positive for EMA and TTF-1, and negative for CK. Therefore, the final histopathologic diagnosis of the specimen was a sclerosing hemangioma.

DISCUSSION

Sclerosing hemangioma is relatively rare, the second most common benign pulmonary neoplasm, and named due to histologically prominent features of sclerotization and vascularization of the tumor (1). Many recent immunohistochemical stud-
ies supported that pulmonary sclerosing hemangioma arises from epithelial cells, probably the type II pneumocyte (4).

Typically, it occurs in middle-aged adults, with a predilection on females, who are usually asymptomatic until the time of diagnosis similar to this case (5). The tumor has well-defined margins, but not a definite capsule, and can grow expansively by compressing the adjacent lung parenchyma or bronchus. The CT findings show round or ovoid shape, a smooth margin, homogeneous attenuation, calcification, and strong early enhancement (6). In PET-CT scans, the majority of sclerosing hemangioma show increased FDG uptakes, the SUV_max of tumors ranged from 0.60 to 4.7 (median 2.30), and tumor ≥ 2 cm can frequently be falsely interpreted as malignancy (7). The tumor in our case shows intense FDG uptakes (SUV_max: 5.8). Single tumor localizations in the pulmonary parenchyma is a major concern. However, there are exceptional presentations such as endobronchial localization, which is extremely rare and mimics a slow growing low grade central lung malignancy such as carcinoid tumor. The reported doubling time of carcinoid tumor was 417 days and shorter than that of sclerosing hemangioma, which was reported to be 965 days (8, 9). The presence of sclerosing hemangioma inside a bronchus may not be a proliferation from the bronchus itself but a proliferation from peribronchial lung parenchyma invading adjacent bronchus (2). Histologically, the sclerosing hemangioma is a mixture of solid, papillary, sclerotic or hemorrhagic patterns. The proportions of these four components in the tumor usually vary, although one of them tends to predominate. Sugio et al. (1) reported that most sclerosing hemangioma cases exhibit a papillary pattern, while Devouassoux-Shisheboran et al. (10) reported that predominant endobronchial component by bronchial biopsy of this tumor was papillary and solid pattern.

The sclerosing hemangioma of our case exhibited endobronchial portion in the posterior segmental bronchus of RUL, and this tumor was initially misdiagnosed as a papillary adenoma. The initial specimen obtained by bronchoscopic biopsy contained only papillary patterns of the mass. The endobronchial mass biopsy obtained by bronchoscopy is widely used for the diagnosis of central lung lesions with endobronchial portion, regardless of benignity or malignancy as this method is less invasive and simpler than surgical biopsy. However, the bronchoscopic biopsy may not be a sufficient method for the pathologic diagnosis of sclerosing hemangioma which has four different pathologic components. Nevertheless, a tiny specimen does not show the entire features of sclerosing hemangioma and may result in inaccurate diagnosis. Therefore, surgical methods, including wedge resection or segmentectomy, can exhibit entire features of sclerosing hemangioma and establish complete resection of the tumor. Furthermore, sclerosing hemangioma can grow and usually show high FDG-uptakes. Therefore, within such situations, results of limited biopsy specimens should be doubted.

Sclerosing hemangioma is a progressively growing benign tumor with high FDG uptake and may have endobronchial portion which is extremely rare. Therefore, it can mimic slow growing central lung malignancy such as carcinoid tumor on imaging findings. Furthermore, this tumor is composed of four pathologic patterns: the papillary, sclerotic, solid and hemorrhagic components. Thus, the diagnosis by limited specimen through bronchoscopic biopsy may be insufficient. For accurate diagnosis, a complete surgical resection should be recommended in radiological suspicions of central lung malignancy or central sclerosing hemangioma with endobronchial extensions.

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