An intrathoracic schwannoma case in ^{18}F-FDG PET/CT scan

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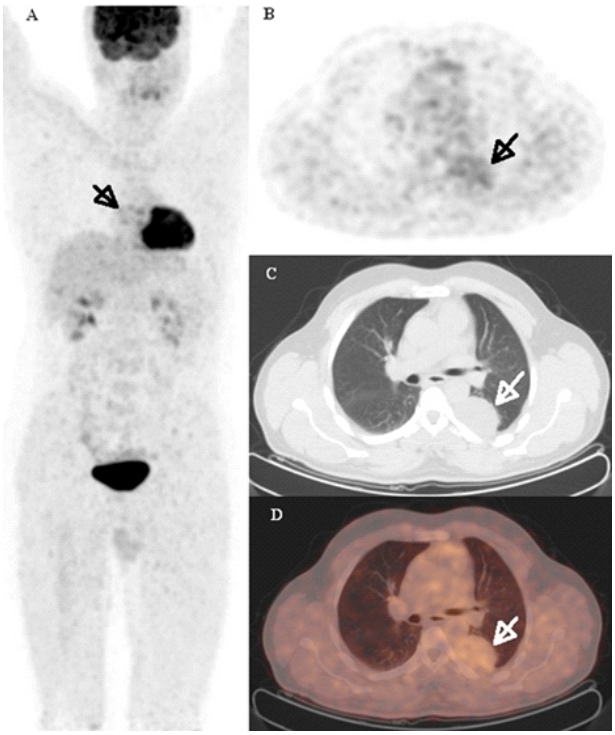

Figure 1. A 39-year-old male patient presented with complaints of increased dyspnea with effort. Computed tomography (CT) was performed to the patient. On CT, a mass was detected in the left lower lobe of superior segment, with a pleural-based soft tissue density based on the posterior costovertebral groove. The mass was closely related to the thoracic aorta. It was decided to perform fluorine-18-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography (PET)/CT to the patient with suspicion of malignancy.

Positron emission tomography /CT images showed a moderately increased ^{18}F-FDG uptake in the mass of left lung lower lobe superior segment (SUVmax: 2.71). No pathological ^{18}F-FDG involvement was detected in another region of the whole body scan (Figure 1; black and white arrows). The patient underwent tru-cut biopsy. Since histopathological diagnosis could not be made, thoracotomy was performed.

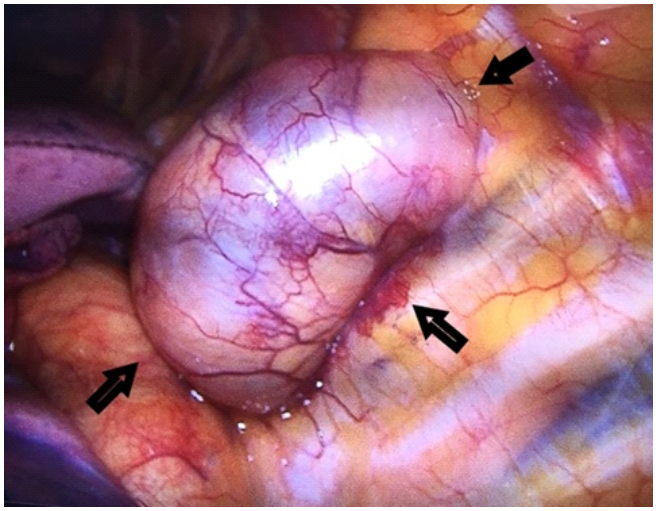

Figure 2. The mass located in the posterior mediastinum of the patient was surgically removed by thoracotomy (black arrows) and sent for histopathological examination.

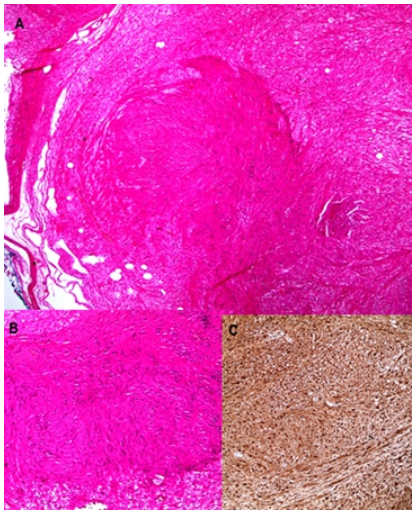

Figure 3. In histopathological examination, neoplastic proliferation formed by wavy elonge spindle cells, where the areas of Antoni A and Antoni B were located on the ground showing xanthomatous and myxoid changes, were observed (A,B). In the immunohistochemical examination, S 100 diffuz (+) (C); Actin, Desmin and CD34 are negative. The Ki-67 proliferation index was 5%. Atypia and necrosis have not been observed. The final diagnosis was reported as schwannoma.

Schwannomas are the second most common benign peripheral nerve sheath originated tumor. Due to its development from Schwann cells, it can be seen in all organs or tissues during intracranial, extracranial, or spinal nerve courses where these cells are found [1]. Schwannomas are extremely rare in the lung, regardless of the patient's age. Ohtsuka et al. (2005) [2] stated that in the review of 62 patients with intrapulmonary or bronchial schwannoma (5-83 years; 28 male, 34 female patients), this neoplasm constitutes approximately 0.2% of all pulmonary neoplasms. Although it is usually sporadic and single lesion, it can also be seen with neurofibromatosis NF1 or NF2 [3, 4]. Especially in schwannomatosis cases, NF2 is observed with multiple and benign characters [5]. In patients with tumors located proximal to the lobar bronchus, atelectasis or pneumonia associated with cough and dyspnea may occur. However, most patients with peripheral intrapulmonary schwannoma have no symptoms [2]. Fluorine-18 FDG-PET/CT is a useful imaging modality to separate malignant solitary pulmonary nodules from benign nodules. There are few cases of ^{18}F-FDG PET/CT imaging intrapulmonary schwannoma in the literature [6-9]. Maximum standardized uptake values (SUVmax) of Schwannomas in ^{18}F-FDG PET/CT are variable. Maximum standardized uptake values are generally low and moderate, but have been shown to vary between 1.9-7.2. The reason for the variation in SUVmax is thought to be due to varying degrees of cellularity, microvascular density or vascular permeability [9]. Histopathologically, dense cellular areas (Antony A) and more hypocellular areas (Antony B) specific to Schwannoma appear in varying proportions. Also, the structure formed by spindle schwann cells side-by-side within the fields of Antony (Verocay body) is characteristic [10]. Surgical resection, endoscopic resection and yttrium aluminum garnet (YAG) laser resection were used for the treatment of primary intrapulmonary schwannoma [2].

The contribution of ^{18}F-FDG PET/CT in schwannoma is that it provides malign and benign distinctions of intrapulmonary masses. However, a cut-off for SUVmax has not been identified in the malignant benign distinction. The diagnosis must be verified histopathologically.

Bibliography

1. Skovronsky DM, Oberholtzer JC. Pathologic classification of peripheral nerve tumors. *Neurosurg Clin N Am* 2004; 15: 157-66.
2. Ohtsuka T, Nomori H, Naruke T et al. Intrapulmonary schwannoma. *Jpn J Thorac Cardiovasc Surg* 2005; 53: 154-6.
3. Halliday AL, Sobel RA, Martuza RL. Benign spinal nerve sheath tumors: their occurrence sporadically and in neurofibromatosis types 1 and 2. *J Neurosurg* 1991; 74: 248-53.
4. Ferner RE, O'Doherty MJ. Neurofibroma and schwannoma. *Curr Opin Neurol* 2002; 15: 679-84.
5. Evans DG, Huson SM, Donnai D et al. A clinical study of type 2 neurofibromatosis. *Q J Med* 1992; 84: 603-18.
6. Yabuki H, Tabata T, Sugawara T et al. Schwannoma occurred in the right upper bronchial inlet; report of a case. *Kyobu Geka* 2012; 65: 594-7.
7. Gonzalez M, Prior JO, Rotman S et al. Benign intrapulmonary schwannoma: aspect on F-18 fluorodeoxyglucose PET/CT. *Clin Nucl Med* 2011; 36: 465-7.
8. Nakamura R, Ishikawa S, Sakai M et al. Increased fluorodeoxyglucose-uptake in positron emission tomography with an endobronchial schwannoma occluding the left main stem bronchus. *J Thorac Oncol* 2009; 4: 1183-4.
9. Ushiyama T, Katsuda E, Tanaka M et al. ^{18}F-fluorodeoxyglucose uptake and apparent diffusion coefficient in lung schwannoma. *Clin Imaging* 2012; 36: 65-7.
10. Artico M, Cervoni L, Wierzbicki V et al. Benign neural sheath tumours of major nerves: characteristics in 119 surgical cases. *Acta Neurochir(Wien)* 1997; 139: 1108-16.

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