



Laryngeal Tuberculosis Mimicking Laryngeal Carcinoma on ¹⁸F-FDG PET/CT Imaging

¹⁸F-FDG PET/BT Görüntüleme de Maligniteyi Taklit Eden Laringeal Tüberküloz

Arzu Cengiz¹, Sibel Göksel¹, Yeşim Başal², Şule Taş Gülen³, Füzüzan Döğür⁴, Yakup Yüreklil¹

¹Adnan Menderes University Faculty of Medicine, Department of Nuclear Medicine, Aydın, Turkey

²Adnan Menderes University Faculty of Medicine, Department of Otorhinolaryngology, Aydın, Turkey

³Adnan Menderes University Faculty of Medicine, Department of Chest Diseases, Aydın, Turkey

⁴Adnan Menderes University Faculty of Medicine, Department of Pathology, Aydın, Turkey

Abstract

Laryngeal tuberculosis is a rare presentation of tuberculosis. It can mimic laryngeal carcinoma with its clinical and imaging findings. A 51-year old woman underwent ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography (PET/CT) imaging for clinically suspected carcinoma of the larynx. PET/CT revealed lung lesions consistent with tuberculosis in addition to hypermetabolic focus on larynx. The patient was histopathologically diagnosed with lung and laryngeal tuberculosis.

Keywords: Tuberculosis, laryngeal cancer, positron emission tomography/computed tomography

Öz

Laringeal tüberküloz, tüberkülozun nadir bir formudur. Klinik ve radyolojik bulguları larinks karsinomunu taklit edebilir. Klinik olarak larinks karsinomu şüphesi olan 51 yaşında bir kadın hastaya ¹⁸F-fluorodeoksiglukoz pozitron emisyon tomografisi/bilgisayarlı tomografi (PET/BT) ile görüntüleme yapıldı. PET/BT larinkste hipermetabolik odağa ilave olarak tüberkülozla ilişkili akciğer lezyonlarını ortaya çıkardı. Hasta histopatolojik olarak akciğer ve larinks tüberkülozu tanısı aldı.

Anahtar kelimeler: Tüberküloz, larinks kanseri, pozitron emisyon tomografisi/bilgisayarlı tomografi

Introduction

Laryngeal tuberculosis is an infrequent manifestation of extrapulmonary tuberculosis. It occurs in only 1% of all cases (1,2). Usually, it is seen as a complication of pulmonary tuberculosis, nevertheless, solitary laryngeal involvement is possible. Clinical, laryngoscopic and radiological findings of laryngeal tuberculosis have a tendency to mimic laryngeal cancer (3,4). There are no specific findings of extrapulmonary tuberculosis in ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) positron emission tomography/computed

tomography (PET/CT), which can also mimic malignancy (5). Herein we present a case of laryngeal tuberculosis who underwent ¹⁸F-FDG PET/CT imaging with a preliminary diagnosis of laryngeal carcinoma without any clinical pulmonary manifestations.

Case Report

A 51-year-old woman was referred to our otolaryngology clinic with a history of cough, hoarseness, and sore throat. Her prior medical history was unremarkable. She had been

Address for Correspondence: Arzu Cengiz MD, Adnan Menderes University Faculty of Medicine, Department of Nuclear Medicine, Aydın, Turkey
Phone: +90 505 264 58 57 E-mail: arzukincengiz@gmail.com ORCID ID: orcid.org/0000-0003-2110-4450

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smoking for the past 20 years. The laryngoscopy revealed diffuse swelling and a lesion involving both arytenoids and the marginal portion of the epiglottis, which suggested carcinoma of the larynx. Histopathologic examination of the lesion demonstrated necrosis and was interpreted as suspicious for malignancy, thus recommending a second biopsy.

Contrast-enhanced computed tomography (CT) scan of the neck demonstrated edema and asymmetry of the epiglottic vallecula. Thorax CT showed multiple nodules that resembled pulmonary metastases on both lungs. The patient underwent ^{18}F -FDG PET/CT imaging for diagnosis and staging. PET/CT imaging showed hypermetabolic focus on left aryepiglottic fold and interarytenoid area maximum standard uptake values (SUV_{max}): 8.9 without any anatomical correlation. In addition, there were multiple hypometabolic nodules (SUV_{max} : 1.5) and hypermetabolic infiltrations (SUV_{max} : 6) on both lungs along with mildly hypermetabolic cervical lymph nodes (Figure 1, 2). The second laryngeal biopsy revealed necrotizing granulomatous inflammation suggesting tuberculosis (Figure 3). PCR assay was positive for mycobacterium tuberculosis. The patient was diagnosed as lung and laryngeal tuberculosis, and was started on antituberculosis medication.



Figure 1. Whole body ^{18}F -FDG PET/CT imaging revealed high FDG accumulation in the larynx, lung parenchyma and milimetric cervical lymph nodes

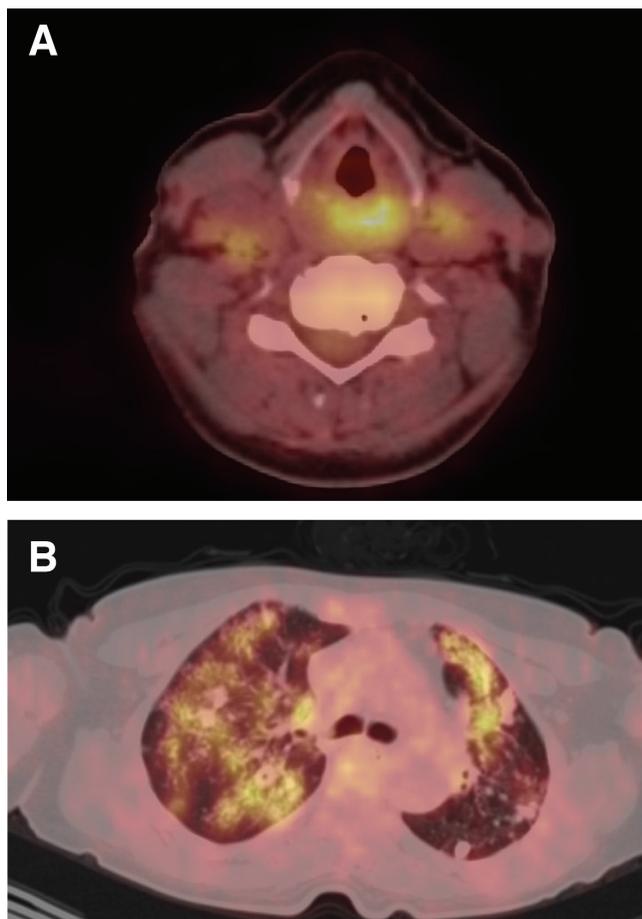


Figure 2. PET/CT fusion images showed hypermetabolic foci in the left aryepiglottic fold and interarytenoid area maximum standard uptake values (SUV_{max}): 8.9 (A). On transaxial thorax fusion images, there were multiple hypometabolic nodules (SUV_{max} : 1.5) and hypermetabolic infiltrations (SUV_{max} : 6) on both lungs, indicating tuberculosis (B)

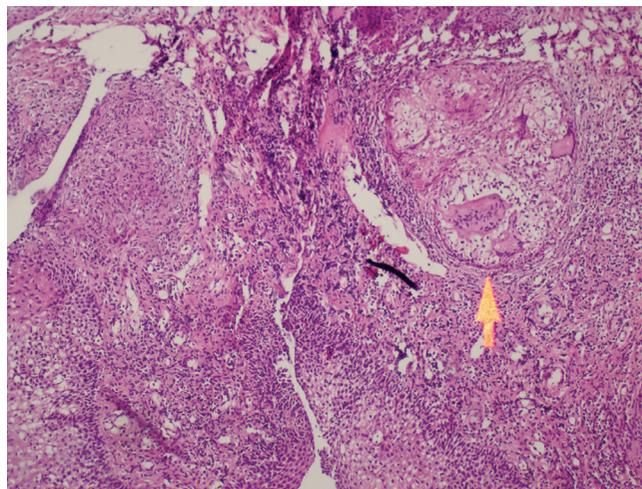


Figure 3. Photomicrograph showing giant cell granuloma (hematoxylin&eosin x200)

Literature Review and Discussion

Although a rare clinical condition, laryngeal tuberculosis is the most common granulomatous disease of the larynx. Primary laryngeal disease is rare and it usually occurs due to hematogenous dissemination or direct extension of a pulmonary tuberculosis infection (6). The chief complaints in our patient were cough, hoarseness and sore throat. The most common presenting symptom is hoarseness, which is reported to be present in 80-100% of patients. Other symptoms include odynophagia, dysphagia, dyspnea, stridor, cough and hemoptysis (7). These symptoms are also associated with laryngeal carcinoma. On physical examination, laryngeal tuberculosis can manifest as edema, hyperemia, ulcerations, nodule or an exophytic mass. Vocal cords are the most affected site followed by the ventricular strip, epiglottis, subglottic region and posterior commissure (8). CT and MR imaging demonstrate the diffuse nature of the disease and the involvement of the paralaryngeal spaces more accurately than laryngoscopy. Consistent with other studies, Moon et al. (9) detected focal thickening or a mass in the vocal cords, epiglottis and paralaryngeal tissue on CT imaging. ^{18}F -FDG PET/CT is a non-invasive imaging method that is being widely used for the differentiation of benign and malignant lesions. However, ^{18}F -FDG may also accumulate in inflammatory cells. ^{18}F -FDG uptake has previously been reported in tuberculomas and other tuberculosis related lesions (10). In a study, 88 cases with extrapulmonary tuberculosis was reported to show high ^{18}F -FDG uptake on PET imaging with a SUV_{max} ranging from 1.3 to 23.2 (11). In our case, PET/CT imaging showed high ^{18}F -FDG uptake in the extrapulmonary tuberculosis focus with a SUV_{max} of 8.9. In addition, there were multiple hypometabolic nodules (SUV_{max} : 1.5) and hypermetabolic infiltrations (SUV_{max} : 6) on both lungs, which were consistent with pulmonary tuberculosis that has not been previously diagnosed. As a whole body scanning method, ^{18}F -FDG PET/CT facilitates the detection of extra pulmonary tuberculosis. Although it is a rare condition, extrapulmonary tuberculosis of the head and neck should be kept in mind as part of differential diagnosis, especially in regions where pulmonary tuberculosis is common.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Y.B., Ş.T.G., Concept: A.C., Y.Y., Design: A.C., Data Collection or Processing: A.C., S.G., F.D., Y.Y., Analysis or Interpretation: A.C., Y.Y., Literature Search: A.C., Writing: A.C., Y.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

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References

1. Topak M, Oysu C, Yelken K, Sahin-Yilmaz A, Kulekci M. Laryngeal involvement in patients with active pulmonary tuberculosis. *Eur Arch Otorhinolaryngol* 2008;265:327-330.
2. Egeli E, Oghan F, Alper M, Harputluoglu U, Bulut I. Epiglottic tuberculosis in a patient treated with steroids for Addison's disease. *Tohoku J Exp Med* 2003;201:119-125.
3. Kim MD, Kim DI, Yune HY, Lee BH, Sung KJ, Chung TS, Kim SY. CT findings of laryngeal tuberculosis: comparison to laryngeal carcinoma. *J Comput Assist Tomogr* 1997;21:29-34.
4. Lim JY, Kim KM, Choi EC, Kim YH, Kim HS, Choi HS. Current clinical propensity of laryngeal tuberculosis: review of 60 cases. *Eur Arch Otorhinolaryngol* 2006;263:838-842.
5. Fernandez P, Guyot M, Lazaro E, Viallard JF, Allard M, Ducassou D. Systemic tuberculosis presenting as an epiglottic mass detected on F-18 FDG PET/CT. *Clin Nucl Med* 2007;32:719-724.
6. Rizzo PB, Da Mosto MC, Clari M, Scotton PG, Vaglia A, Marchiori C. Laryngeal tuberculosis: an often forgotten diagnosis. *Int J Infect Dis* 2003;7:129-131.
7. Smulders YE, De Bondt BJ, Lacko M, Hodge JA, Kross KW. Laryngeal tuberculosis presenting as a supraglottic carcinoma: a case report and review of the literature. *J Med Case Rep* 2009;20;3:9288.
8. Yencha MW, Linfesty R, Blackmon A. Laryngeal tuberculosis. *Am J Otolaryngol* 2000;21:122-126.
9. Moon WK, Han MH, Chang KH, Kim HJ, Im JG, Yeon KM, Han MC. Laryngeal tuberculosis: CT findings. *AJR Am J Roentgenol* 1996;166:445-449.
10. Goo JM, Im JG, Do KH, Yeo JS, Seo JB, Kim HY, Chung JK. Pulmonary tuberculoma evaluated by means of FDG PET: findings in 10 cases. *Radiology* 2000;216:117-121.
11. Liu W, Li X, Yin J, Li X, Wang X. [Diagnostic value of (18)F-FDG PET/CT in extrapulmonary tuberculosis]. *Nan Fang Yi Ke Da Xue Xue Bao* 2013;33:1083-1086.