

# Laryngeal squamous cell cancer with late presentation of isolated liver metastasis on fluorodeoxyglucose positron emission tomography-computed tomography

Sabire Yılmaz Aksoy, Betül Vatankulu<sup>1</sup>, Metin Halac<sup>1</sup>, Kerim Sönmezoglu<sup>1</sup>

Department of Nuclear Medicine, Ankara Atatürk Training and Research Hospital, Ankara, <sup>1</sup>Department of Nuclear Medicine, Cerrahpasa Medical Faculty, University of Istanbul, Istanbul, Turkey

## ABSTRACT

Laryngeal cancer is the second most common type of head and neck malignancy, representing approximately 45% of all head and neck cancers. Hematogenous spread to the liver rarely occurs without evidence of pulmonary and bone disease. We report a patient who had been treated 7 years earlier for laryngeal squamous cell cancer and who had isolated liver metastasis on fluorodeoxy D-glucose positron emission tomography-computed tomography.

**Keywords:** Fluorodeoxy D-glucose positron emission tomography-computed tomography, laryngeal cancer, liver metastasis

## INTRODUCTION

Laryngeal cancer is the second most common type of head and neck malignancy, representing approximately 45% of all head and neck cancers. The majority of larynx cancer was squamous cell cancer (SCC), and they can involve the supraglottis (30%), glottis (65%), and subglottis (5%).<sup>[1]</sup> These tumors spread regionally by the lymphatic way and distally by the hematogenous way, except for glottic cancers. Tumor volume and biological aggressiveness affect the regional and distant metastases. Regional metastases usually tend to arise ipsilateral to primary tumor. Supraglottic larynx cancers most frequently metastasize to the upper jugular lymph nodes.<sup>[1]</sup>

<sup>18</sup>F-fluorodeoxy-D-glucose positron emission tomography-computed tomography (<sup>18</sup>F-FDG-PET-CT) has been effectively used in evaluation of head and neck squamous cell carcinomas and has been shown to be useful in various clinical

settings, ranging from pretreatment staging to radiotherapy planning, treatment response assessment, and posttherapy follow-up. Locoregional or distant recurrence can occur in head and neck cancers despite initial aggressive treatment, especially within the 1<sup>st</sup> year. Early detection of locoregional disease may improve survival by increasing the effectiveness of salvage therapy. However, the real advantage of early detection of distant metastases in asymptomatic patients is still unclear.<sup>[2]</sup> PET-CT imaging is superior to physical examination and conventional imaging in detection of locoregional recurrence, as well as distant lesions and metachronous primary tumors.

The incidence of distant metastasis is relatively low in head and neck squamous cell carcinoma in comparison to other malignancies but remains a major determinant of prognosis. Therefore, detection of distant metastases is an important factor in clinical decision-making. Distant metastasis is seen in 11–26% of patients with head and neck cancer.<sup>[3,4]</sup> However, one study reported that distant metastasis occurs in only 5% of the patients,

### Address for correspondence:

Dr. Sabire Yılmaz Aksoy, Department of Nuclear Medicine, Ankara Atatürk Training and Research Hospital, Ankara, Turkey.  
E-mail: sbr\_ylmz@yahoo.com

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for whom initial treatment had achieved locoregional control.<sup>[5]</sup> In this case report, we presented a patient with laryngeal SCC who develop isolated liver metastasis 7 years after diagnosis.

## CASE REPORT

A 51-year-old male patient with laryngeal cancer had a history of total laryngectomy + bilateral lymph node dissection operation 7 years ago. The patient had also received adjuvant chemotherapy and local radiation therapy. He had no complaint until the last 2 weeks; however, then, he reported right upper abdominal pain. On physical examination, tenderness in liver area and hepatomegaly were found. Abdominal ultrasound showed a gross mass lesion in the liver, and the patient referred to the nuclear medicine department for FDG-PET/CT scan to restage the disease.

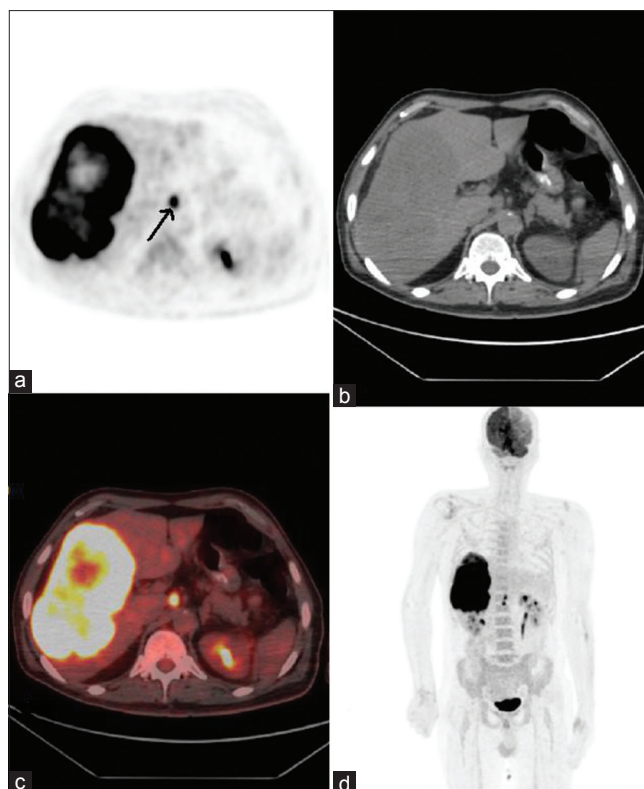
FDG-PET/CT demonstrated that there was a gross mass lesion replacing the right hepatic lobe and extending to medial segment of the left lobe which had very intense FDG accumulation (maximum standardized uptake value: 32, 7), with hypometabolic necrotic area. In addition, there was increased FDG uptake at the celiac lymph node measuring approximately 1 cm in diameter in the upper abdomen [Figure 1, arrow]. On the other hand, there was no pathological tracer uptake at the laryngeal region and cervical-mediastinal lymphatic stations [Figure 1]. The Tru-cut biopsy of the liver mass confirmed poorly differentiated squamous cell metastasis. Upon this, the patient received chemotherapy (cisplatin, docetaxel, and zometa) for 6 months. Posttreatment CT imaging demonstrated progression of liver metastasis and the patient died 15 days after CT imaging.

Here, we reported a case of laryngeal SCC with late liver-only metastasis on FDG-PET/CT.

## DISCUSSION

In head and neck cancer, the majority of distant metastases appear within 2 years of diagnosis which is mostly to the lung (45–85%), followed by bones (10–30%) and liver (5–22%).<sup>[3–5]</sup> Our patient presented with isolated liver metastasis 7 years after complete resection of tumor although hematogenous spread to liver rarely occurs without evidence of pulmonary and bone disease. There were also some reports of soft-tissue metastases from laryngeal cancer including gluteus maximus and scapular muscles. Another report describes supraglottic larynx cancer which involves all five distal phalanges of the left hand with simultaneous metastases to lung and liver.<sup>[6]</sup>

Several posttreatment studies found that FDG-PET had a similar accuracy for the detection of locoregional and distant recurrence in head and neck cancer. Sensitivities ranged from 92% to 100%, specificities from 64% to 100%, positive predictive values from 64% to 100%, negative predictive values from 92% to 100%, and overall accuracy from 88% to 91% in these studies.<sup>[7,8]</sup> The



**Figure 1:** Axial positron emission tomography (a), computed tomography (b), positron emission tomography-computed tomography fusion (c), and maximum intensity projection (d) images of a 51-year-old male patient with laryngeal cancer. Fluorodeoxy D-glucose positron emission tomography-computed tomography demonstrated that there was a gross mass lesion replacing the right hepatic lobe and extending to medial segment of left lobe which had very intense fluorodeoxy D-glucose accumulation (maximum standardized uptake value: 32, 7) with hypometabolic necrotic area and celiac lymph node measuring approximately 1 cm in diameter with increased fluorodeoxy D-glucose uptake (arrow)

performance of PET/CT for the detection of distant metastases in patients with laryngeal cancer was even better, with an accuracy of 100%, probably because posttreatment changes are not seen outside the cervical region.

The goal of the treatment is definitive cure for larynx cancer. The commonly used treatment modalities are both surgery and radiotherapy.<sup>[1]</sup> Several investigators have reported using conformal radiation therapy or hepatic arterial infusion chemotherapy<sup>[9]</sup> for patients with isolated SCC metastasis to the liver. The benefit of liver surgery in hepatic-only metastasis from head and neck cancer is not clear. Although screening for metastasis is believed to be senseless during follow-up, 5-year survival of 15–20% can be expected in patients with isolated liver metastasis by surgery.<sup>[10]</sup> Hence, early and accurate detection of metastases may play an important role for patient survival. Although liver function tests may detect abnormality, elevation in liver enzymes has low sensitivity or specificity for liver involvement. A whole-body FDG-PET/CT scanning is a useful method to restage the disease. In conclusion, hematogenous spread to the liver rarely occurs without evidence of pulmonary and bone disease. Although most of the metastases are seen within the 1<sup>st</sup> year, our patient presented with isolated liver metastasis 7 years after laryngeal

cancer diagnosis. We used PET/CT to define this as an isolated lesion. The systematic use of PET/CT of the usual follow-up could be proposed, but it should be noted that cost-effectiveness and survival analysis is needed.

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### Conflicts of interest

There are no conflicts of interest.

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