Case Report

18FDG PET in primary oat cell carcinoma of the esophagus

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Abstract

The role of FDG-PET in oat cell carcinoma of the esophagus is hitherto unexplored. A MEDLINE search using the terms “small cell carcinoma” or “oat cell carcinoma” combined with “FDG-PET” yielded no report on this issue till date. We report, in this article, two cases depicting the usefulness of this modality in the management of this uncommon neoplasm. While reevaluation of unsuspected metastatic sites missed by other modalities suggest its role in M staging, whole body FDG PET (both baseline as well as post treatment) may find important role in treatment monitoring and evaluation in residual viable disease, taking into account the systemic nature of the disease.

Key Words: Primary small cell carcinoma of esophagus, FDG-PET, Oat cell carcinoma

Introduction

Oat cell carcinoma (small cell carcinoma) of the esophagus is a rare and aggressive tumor with a poor prognosis and early systemic metastasis. The optimal treatment schedule has not yet been defined. Several recent reports have appeared, claiming that small-cell carcinoma can be satisfactorily treated by chemotherapy and radiation therapy combined with surgery.[1-3] In planning therapy, particular importance has been attached to a multimodality approach incorporating systemic treatment. There has not been any literature, however, regarding the utility of 18FDG-PET in this neoplasm. We, in this article, present 2 cases of small cell carcinoma of the esophagus, where FDG-PET detected unsuspected metastatic sites, not detected by conventional investigative modalities, in addition to avid uptake in the primary. To the best of our knowledge, this is the first report investigating the usefulness of FDG PET in this aggressive tumour.

Materials and Methods

PET Studies

Patients were fasting at least for 6 hours. Sixty minutes after injection of 444 MBq FDG, patients were imaged on the dedicated BGO based GE Advance PET scanner (General Electric Medical systems, Milwaukee, WI). Images were reconstructed using the attenuation weighted Ordered Subsets Expectation Maximization (OSEM) algorithm.

Data analysis

Axial, coronal, sagittal and 3D images were visually interpreted and foci of increased tracer uptake were considered as disease involvement. The PET scan was interpreted by two experienced nuclear medicine physicians. The standardized uptake values (SUVmean) were calculated using the inbuilt software designed to do the same.
The findings of PET were then compared lesion by lesion with that of CT regarding staging and disease evaluation.

**Case 1**

A 63 year old female presented with complaints of progressive dysphagia of 3 months duration. A CT scan of the chest and abdomen revealed circumferential wall thickening in the mid lower esophagus with luminal narrowing and few small gastrohepatic nodes (not shown in the figure). However, there was no significant paraesophageal extension or mediastinal adenopathy or pleuroparenchymal lesion in the lungs noted. An endosonography (EUS) revealed a growth at 19 cm from which multiple biopsies were taken. The histopathology report was suggestive of small cell carcinoma of the esophagus. A FDG PET whole body scan (Figure 1a and 1b) showed focally increased abnormal tracer uptake in the primary tumour in the esophagus, in right suprahilar nodes and multiple nodes in the abdomen (broken line), all of which were positive for metastasis from the primary (obtained after surgical removal). The SUVmean was 10.004.

**Case 2**

A 65 yr old female presented with dysphagia to both solid and liquid of recent onset and was found to have esophageal narrowing on barium swallow. CT scan of thorax revealed concentric thickening commencing approximately 0.5 cm distal to carinal and extending over 3 cm. Few small lymph nodes noted in the pretracheal, anterior carinal and aortopulmonary window regions. The upper GI endoscopy revealed a polypoidal ulcerating growth at the same site and biopsy from the region proved it to be case of small cell carcinoma of the esophagus. The patient was referred for a FDG-PET for disease evaluation. The whole body FDG-PET (Figure 2) showed a small linear area of intense FDG uptake in the region of middle 1/3rd of the esophagus. The SUVmean was 8.95. A small focus of FDG uptake was also noted in the right supraclavicular area most likely representing a diseased node. On biopsy, the supraclavicular node was positive for metastasis, while the pretracheal, anterior carinal and aortopulmonary nodes were negative for metastasis.

**Discussion**

Small cell carcinoma arising in the esophagus, histologically indistinguishable from its counterpart of the lung, is a relatively rare disease. It was first described in 1952 by McKeown and around 200 cases have been reported till now. It has a high incidence of metastatic disease at presentation and a poor overall prognosis. Treatment strategies are not well defined because of lack of large studies. FDG-PET significantly improves the detection of stage IV disease in esophageal cancer (squamous cell carcinoma and adenocarcinoma) compared with the conventional staging modalities. It also improves diagnostic specificity for nodal staging. However, there has been no data exploring the role of FDG-PET in small cell carcinoma of the esophagus. A MEDLINE search was done, using the terms “small cell carcinoma” or “oat cell carcinoma” combined with “FDG-PET” and there were no report obtained on this issue till date. We observed the SUV values to be at par with that seen with squamous cell carcinoma of the esophagus.

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**Figures 1a and b:** FDG PET scan showing focally increased abnormal tracer uptake in the primary tumour in the esophagus, in right suprahilar nodes and multiple nodes in the abdomen

**Figure 2:** FDG-PET scan showing area of intense uptake in the region of middle 3rd of the esophagus
It is important to appropriately assess the disease burden at the initial diagnosis, to plan the optimum treatment strategy, which may be helpful in the long-term prognosis even in this very aggressive neoplasm particularly in the background of several isolated reports describing improved survival.[1-3] The above observations in our case have several implications:

1. Though the histochemical and immunohistochemical study[4] has revealed both epithelial and neuro-endocrine differentiation suggesting that this tumour probably originates from multipotential primitive stem cells in the esophageal mucosa, this case proves that there is avid FDG uptake in the primary.

2. The finding of unsuspected metastatic sites missed by other modalities suggest its role in M staging, akin to the other esophageal malignancies.

3. Taking into account the systemic nature of the disease and the major role of multimodality approach, whole body FDG PET (both baseline as well as post treatment) may find important role in treatment monitoring and evaluation in residual viable disease, thereby having a significant impact on tailoring treatment appropriately, many of which have dose limiting toxicity.[5]

References