

Adenoid Cystic Carcinoma of Buccal Mucosa: Role of ¹⁸F-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography in the Detection and Biopsy of Pulmonary Metastases and Assessment of Treatment Response

Abstract

Adenoid cystic carcinoma of the buccal mucosa has an increased propensity for recurrence and distant metastases. Due to the poor prognosis at late detection of distant metastases, it is advisable to keep a close follow-up. In the present case, ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography proved invaluable in the comprehensive workup of the patient, including detection of local recurrence, distant metastases, and in assessing treatment response.

Keywords: ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography, adenoid cystic carcinoma, lung metastasis, positron emission tomography/computed tomography-guided biopsy, response evaluation

A 54-year-old male presented with pain in the left cheek for 2 months. Five years back, he had undergone wide local excision with left segmental mandibulectomy and lymph nodal dissection, followed by radiotherapy for carcinoma of the left buccal mucosa, which revealed adenoid cystic carcinoma (ACC) in postoperative histopathology. In view of this past history, ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography (¹⁸F-FDG PET/CT) was performed for recurrence evaluation. Maximum-intensity projection [Figure 1a], transaxial CT, and fused PET/CT images revealed FDG-avid lesion in the region of left retromolar trigone [arrow; Figure 1b and c; SUV_{max} 9.3] and buccal mucosa, eroding the adjoining alveolar plate and involving the left lateral pterygoid muscle. Multiple FDG-avid parenchymal nodules [arrow; Figure 1d and e; SUV_{max} 11.6] were also noted in bilateral lung fields.

With suspicion of pulmonary metastasis, the patient was scheduled for ¹⁸F-FDG PET/CT-guided biopsy from the parenchymal nodule in the right lung. With the patient in prone position, the nodule with the maximum FDG uptake was selected for performing needle

biopsy. Transaxial [Figure 2a and b] and sagittal [Figure 2c and d] CT and fused PET/CT images confirmed the correct positioning of the needle. Histopathology of the biopsy specimen confirmed metastatic ACC.

The patient was treated with chemoradiation for 6 months and scheduled for ¹⁸F-FDG PET/CT, 4 months later for response evaluation. Maximum-intensity projection [Figure 3a], transaxial CT, and fused PET/CT images revealed FDG-avid lesion in the region of left retromolar trigone [arrow; Figure 3b and c; SUV_{max} 9.5] and buccal mucosa with no significant change from the previous study. Multiple FDG-avid parenchymal- and pleural-based nodules [arrow; Figure 3d and e; SUV_{max} 42.1] were noted in the bilateral lung fields with increase in FDG avidity, size, and number compared to the previous study, suggesting disease progression. The patient refused further treatment and was lost to follow-up.

ACC is a malignant neoplasm developing more commonly in minor (~60%) than major salivary glands (~40%).^[1] The disease often has an indolent course with multiple episodes of recurrence and distant

Ashwin Singh Parihar,
Shelvin Kumar Vadi,
Bhagwant Rai Mittal,
Rajender Kumar,
Apurva Sood,
Harmandeep Singh,
Amit Bahl¹

Departments of Nuclear Medicine and PET/CT and ¹Radiotherapy, Post Graduate Institute of Medical Education and Research, Chandigarh, India

Address for correspondence:

Dr. Rajender Kumar,
Department of Nuclear Medicine, Post Graduate Institute of Medical Education and Research, Chandigarh - 160 012, India.
E-mail: drrajender2010@gmail.com

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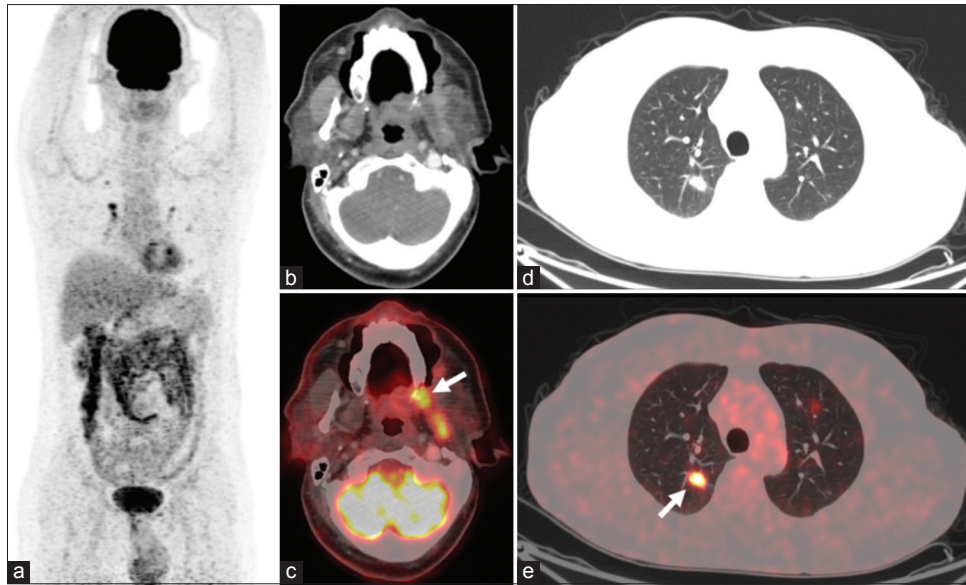


Figure 1: ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography maximum-intensity projection (a), transaxial computed tomography, and fused positron emission tomography/computed tomography images showing fluorodeoxyglucose-avid lesion in the region of left retromolar trigone (arrow; b and c) and buccal mucosa, eroding the adjoining alveolar plate and involving the left lateral pterygoid muscle. Multiple fluorodeoxyglucose-avid parenchymal nodules (arrow; d and e) noted in the bilateral lung fields

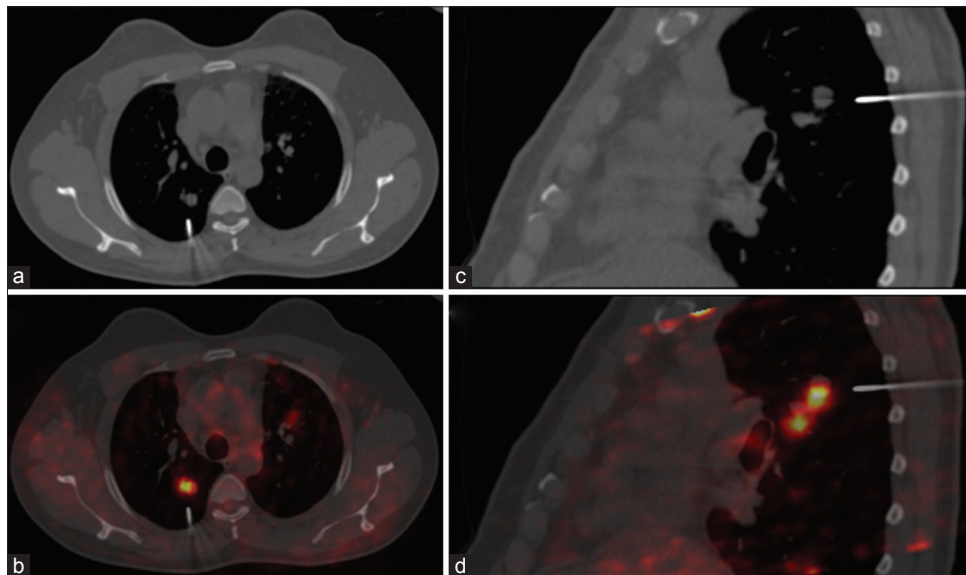


Figure 2: ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography for guided biopsy: transaxial (a and b) and sagittal (c and d) computed tomography and fused positron emission tomography/computed tomography images confirming the correct positioning of the biopsy needle

metastases, commonly to the lung and bones, as a late occurrence.^[1] ACCs have been typically characterized as low grade-to-non-FDG avid tumors, reported as false negative on ^{18}F -FDG PET/CT.^[2,3] Later, various reports demonstrated the role of ^{18}F -FDG PET/CT in evaluating disease recurrence and identification of distant metastases in ACC, thus affecting patient management.^[4,5] In comparison with magnetic resonance imaging, ^{18}F -FDG PET/CT showed superior sensitivity for detection of local tumor recurrence and regional and distant metastases.^[6] Due to the inherent aggressive nature of the primary neoplasm, distant metastases in most patients is inevitable, even after being

treated with curative intent, leading to poor prognosis.^[7,8] The present case illustrates the holistic role of ^{18}F -FDG PET/CT in the entire workup of the patient including identification of local tumor recurrence and distant lung metastases, in their histopathological confirmation by guided biopsy, and in assessing treatment response evaluation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The

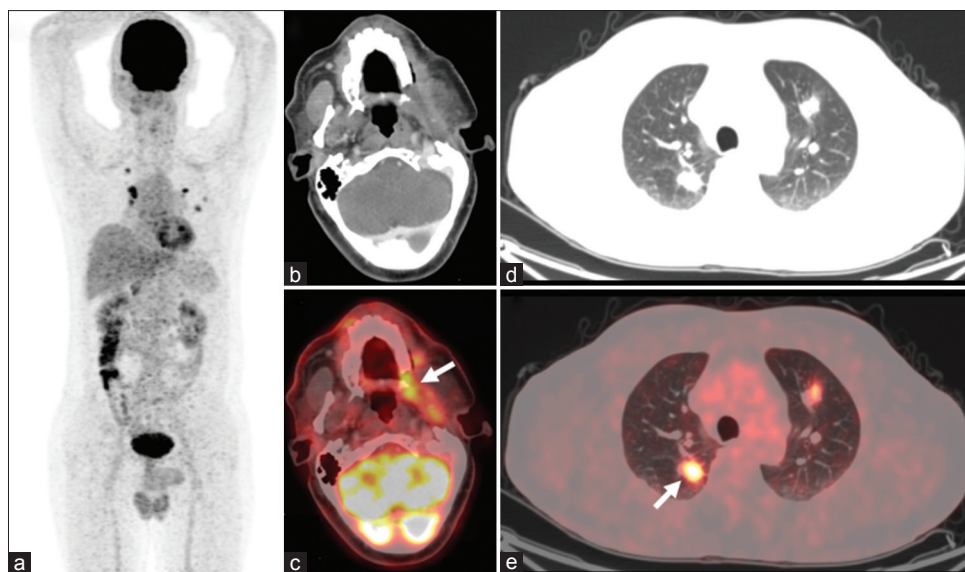


Figure 3: ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography maximum-intensity projection (a), transaxial computed tomography, and fused positron emission tomography/computed tomography images showing fluorodeoxyglucose-avid lesion in the region of left retromolar trigone (arrow; b and c) and buccal mucosa. Multiple fluorodeoxyglucose-avid parenchymal- and pleural-based nodules (arrow; d and e) noted in the bilateral lung fields

patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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