

# $^{18}\text{F}$ -FDG PET-CT for Staging of Conjunctival Melanoma

Andres Damian<sup>1,2</sup>, Javier Gaudiano<sup>1</sup>, Henry Engler<sup>1</sup>, Omar Alonso<sup>1,2</sup>

<sup>1</sup>Uruguayan Center of Molecular Imaging (CUDIM), <sup>2</sup>Nuclear Medicine Center, Clinical Hospital, University of Uruguay, Montevideo, Uruguay

## Abstract

The value of F-18 fluorodeoxyglucose positron emission tomography/computed tomography ( $^{18}\text{F}$ -FDG PET-CT) for the evaluation of cutaneous melanoma has been demonstrated previously. However, there are few reports regarding the use PET-CT for the staging of conjunctival melanoma (CM). We report here a case, a 34-year-old male with a six-month history of a pigmented nodule at the palpebral conjunctiva of the left eye, and a firm left preauricular lymph node detected on physical examination. Biopsy of the ocular lesion confirmed CM, and fine needle aspiration cytology of the preauricular node was positive for malignancy. CT showed three pulmonary nodules. An  $^{18}\text{F}$ -FDG PET-CT was performed to restage the patient. The study showed hypermetabolic lesions in the left eye, and in the left preauricular node. The scan was negative for metastasis. These findings were important in guiding management of the disease in this patient. Future prospective studies should further evaluate the role of  $^{18}\text{F}$ -FDG PET-CT for the staging of CM.

**Keywords:** Conjunctival melanoma, F-18 fluorodeoxyglucose positron emission tomography/computed tomography, positron emission tomography

## Introduction

Although its prevalence is rare, conjunctival melanoma (CM) is a potentially lethal ocular tumor. Its incidence is increasing in the recent years, ranging from 0.2 to 0.5 cases per million in Caucasians. CM can spread locally or systemically in 9-25% of the patients, often in association with involvement of lymph nodes. Metastatic targets include the lungs, liver, gastrointestinal tract, and the central nervous system. Although there is strong evidence concerning the use of F-18 fluorodeoxyglucose positron emission tomography/computed tomography ( $^{18}\text{F}$ -FDG PET-CT) scanning for staging cutaneous melanoma patients, few studies evaluate the role of this imaging modality in the management of CM.<sup>[1-3]</sup>

## Case Report

A 34-year-old male patient was referred to our hospital with a six-month history of a progressive pigmented nodule in the palpebral conjunctiva of the left eye. The patient reported a previous pigmented lesion detected years before. Full ophthalmologic examination revealed a pigmented lesion encompassing both palpebral margins of the left eye, in the bulbar and palpebral conjunctiva. A firm, preauricular node was detected by physical examination. No conjunctival pigmented lesion was detected in the right eye. Systemic examination was unremarkable.

Magnetic resonance imaging (MRI) revealed thickening of the conjunctiva, with a heterogeneous signal at T1 and short time inversion - recovery (STIR), and positive enhancement with gadolinium. The lesion involved the anterior portion of the ocular globe. There was no evidence of metastatic disease.

Conjunctival biopsy showed atypical melanocytosis, compatible with malignant melanoma *in situ* of the conjunctiva, with 2 mm of intraepithelial extension.

CT with intravenous contrast revealed two nodules at the

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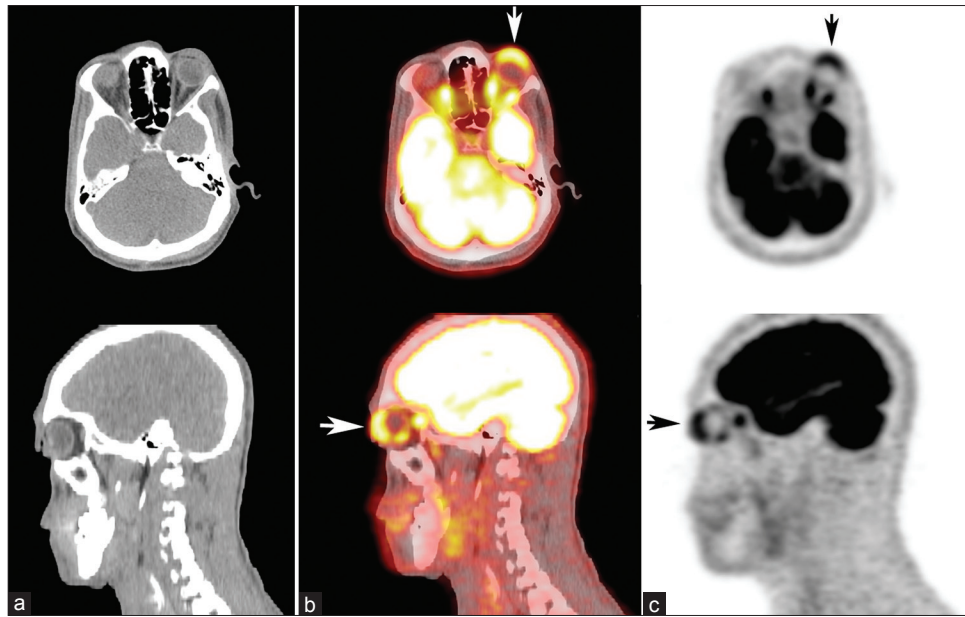
Prof. Omar Alonso, Centro de Medicina Nuclear, Hospital de Clínicas, Av. Italia s/n, Montevideo, Uruguay, PO Box 11600. E-mail: alonso.om@gmail.com

superior lobe of the left lung and one nodule at the inferior lobe of the left lung. A fine needle aspiration biopsy of the preauricular lymph node was positive for malignancy.

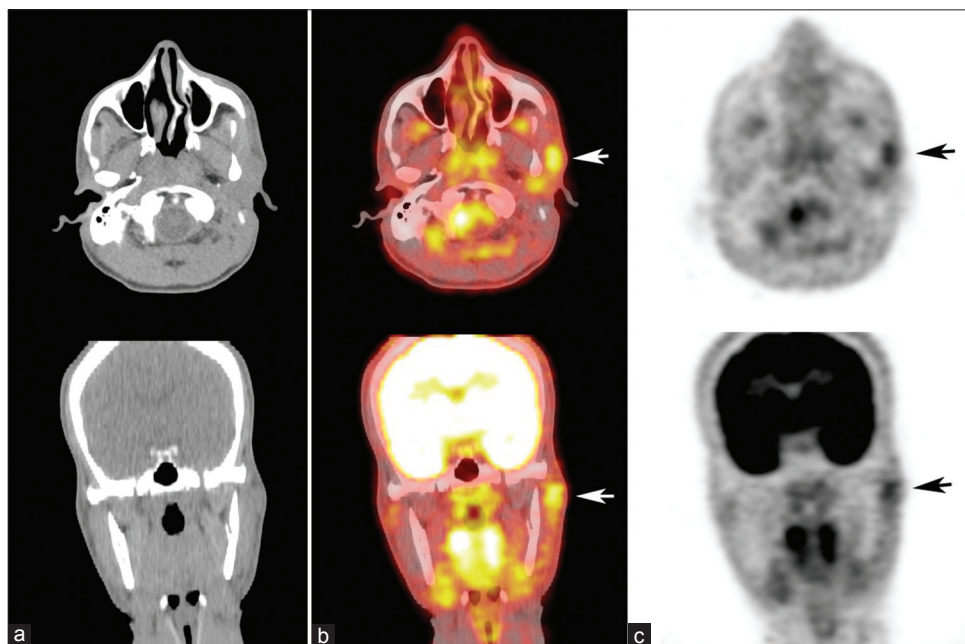
To restage the patient for planning of treatment, a PET-CT scan with  $^{18}\text{F}$ -FDG was performed. This study revealed increased tracer uptake at the primary ocular lesion [Figure 1] and at the preauricular node [Figure 2]. The scan was negative for systemic spread of the disease.

## Discussion

The value of PET-CT for the evaluation of cutaneous melanoma has been demonstrated previously.<sup>[4]</sup> All systematic reviews conclude that sensitivity and specificity for detecting metastasis are higher for PET than for any other conventional imaging procedures.<sup>[4]</sup> Prichard *et al.*<sup>[5]</sup> showed an overall sensitivity and specificity of PET to be 91 and 94%,



**Figure 1:** Transaxial (upper row) and sagittal (lower row) section computed tomography (CT) (a), F-18 fluorodeoxyglucose positron emission tomography/CT ( $^{18}\text{F}$  FDG PET/CT) (b) and PET (c) Images of head and neck region showing increased  $^{18}\text{F}$ FDG uptake in the anterior portion of left ocular globe (arrows), corresponding to the known conjunctival melanoma



**Figure 2:** Transaxial (upper row) and coronal (lower row) section computed tomography (CT) (a), F-18 fluorodeoxyglucose positron emission tomography/CT ( $^{18}\text{F}$  FDG PET/CT) (b) and PET (c) images of head and neck region showing increased  $^{18}\text{F}$ FDG uptake in a preauricular lymph node (arrows)

respectively, compared to 57 and 45%, respectively, for CT. However, there is a remarkable lack of studies evaluating the use of PET-CT in the staging of CM.<sup>[6]</sup> Kurli *et al.*<sup>[6]</sup> evaluated the use of PET-CT for lymph node and metastatic staging of 14 patients with CM. The study was positive for metastatic disease in the liver, lung, peritoneal cavity, lumbar spine, as well as a supraclavicular node in one of these patients. Shulman *et al.*<sup>[7]</sup> reported two patients with synchronous sarcoidosis and CM evaluated with  $^{18}\text{F}$ -FDG PET-CT. They demonstrated the usefulness of PET-CT in evaluating the response to steroid treatment and identifying sarcoidosis granulomas.<sup>[7]</sup>

In this report, we show the potential application of PET-CT to detect lymph node metastasis and guide initial staging of patients with CM. The exclusion of the involvement of other lymph nodes or unidentified systemic lesions was important in guiding management of the disease in this patient. Further clinical trials are needed to evaluate the role of PET scanning in the management of CM.

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