# $^{18}$F-FDG PET/CT of primary malignant melanoma arising from the Eustachian tube region

**Abstract**

Primary malignant melanoma arising from the Eustachian tube is extremely rare. Herein, we reported a case of a 50-year-old woman with right-sided aural fullness. On fluorine-18-fluorodeoxyglucose ($^{18}$F-FDG) positron emission tomography/computed tomography (PET/CT) scans, it presented as mild soft tissue thickening of the right nasopharynx with shallowing of the Rosenmüller fossa and avid $^{18}$F-FDG uptake with a maximum standardized uptake value (SUVmax) of 10.59. Postoperative pathology confirmed malignant melanoma of the right torus tubarius.

*Hell J Nucl Med 2026; 29(2): 137-138* *Epub ahead of print: 6 August 2026* *Published online: 31 August 2026*

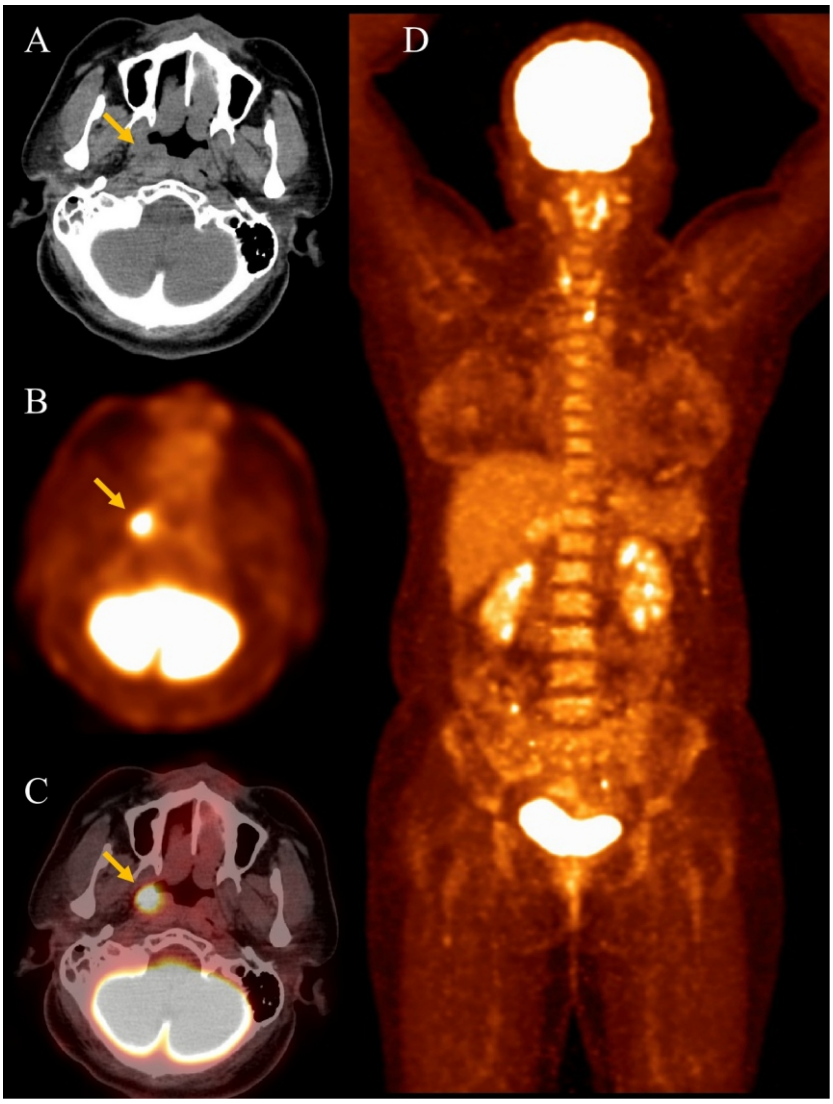


**Figure 1.** A 50-year-old female patient presented with right-sided aural fullness one year ago. An endoscopic examination at a local hospital revealed a nasopharyngeal mass, and she was subsequently referred to our outpatient clinic. Contrast-enhanced magnetic resonance imaging (MRI) of the sinuses at our institution showed soft tissue thickening of the right Eustachian tube with a nodular configuration, as well as stenosis of the pharyngeal orifice of the Eustachian tube, suggesting a neoplastic lesion. To further characterize the disease, the patient underwent positron emission tomography/computed tomography (PET/CT). Axial CT (A), PET (B), fused images (C), and maximum intensity projection (MIP) image (D) demonstrated mild soft tissue thickening in the right nasopharynx with shallowing of the Rosenmüller fossa, along with abnormally increased fluorine-18-fluorodeoxyglucose ($^{18}$F-FDG) uptake (maximum SUV approximately 10.59), consistent with a malignant tumor. The patient subsequently underwent "endoscopic nasopharyngeal tumor resection using a plasma knife combined with endoscopic sinus surgery" under general anesthesia. Postoperative pathology revealed malignant melanoma of the right torus tubarius. Immunohistochemistry: tumor cells positive for HMB45 (+), S-100 (+), MART-1 (focally +), with a Ki67 proliferation index of approximately 40%.

Malignant melanoma is a highly aggressive tumor originating from melanocytes, commonly found in the skin, mucosa, and uveal tract [1]. Among head and neck mucosal melanomas, the nasal cavity is the most common primary site [2]. Melanoma arising primarily in the nasopharynx is extremely rare, accounting for less than 1% of all nasopharyngeal malignancies, and is characterized by high invasiveness, as well as a propensity for recurrence and metastasis [3]. To the best of our knowledge, melanoma primarily originating from the Eustachian tube region is even rarer, with only a few case reports published to date [4], and reports on the $^{18}$F-FDG PET/CT features of Eustachian tube melanoma are especially scarce. Compared with cutaneous melanoma, mucosal melanoma typically exhibits higher $^{18}$F-FDG uptake, and the degree of uptake correlates closely with tumor proliferative activity (e.g., Ki67 index). In this case, the Eustachian tube melanoma showed markedly increased $^{18}$F-FDG uptake (SUVmax 10.59) together with a high Ki67 index of 40%, indicating high proliferative activity and aggressive behavior. This case provides a detailed description of the $^{18}$F-FDG PET/CT findings of malignant melanoma primarily arising from the Eustachian tube region, which may help enhance clinicians' awareness of this rare entity, facilitate differentiation from more common nasopharyngeal tumors such as nasopharyngeal carcinoma, nasopharyngeal lymphoma, and adenoid cystic carcinoma (ACC), and assist in staging, treatment guidance, and disease progression monitoring using PET/CT.

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*The authors declare that they have no conflicts of interest.*

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