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Schneiderian Papillomas of the Maxillary Sinus: High Uptake on Positron-Emission Tomography Using Fluorodeoxyglucose

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Background

Sinonasal papillomas/Schneiderian papillomas (SP) are rare, benign tumors arising from the Schneiderian mucosa (the ectodermalderived pseudostratified ciliated epithelium that lines the nasal cavity and sinonasal tract) and represent the 0.5–4% of all nasal tumors [1,2]. According to the 2017 fourth edition of the WHO classification of Head and Neck tumors, SPs are divided into three subtypes: inverted (ISP), exophytic (ESP), and oncocytic (OSP) [3]. ISPs and OSPs are frequent in the 5th or 6th decades and usually involve the lateral nasal wall and/or paranasal sinuses. ESPs develop in younger patients (3rd or 5th decades) almost always in the nasal septum (especially in the lower anterior aspect). OSP is rare (3–5% of all papillomas) and occurs in older adults (6th to 7th decades) without specific sex predilection. ISP is the most common subtype and microscopically is characterized by invagination of the superficial epithelium (squamous keratinized, respiratory or transient) into the underlying stroma; infiltration of neutrophils in the epithelium and neutrophilic microabscesses are frequent [4,5]. ESP has a papillary architecture with a fibrovascular core lined by squamous, ciliated, columnar, or pseudostratified epithelium [4,6]. OSP can have endophytic or exophytic growth patterns with pseudostratified columnar epithelium composed of cells with abundant eosinophilic granular cytoplasm and uniform hyperchromatic nuclei; microcysts and neutrophil microabscesses are common [4]. Despite being benign lesions, SPs may present an increased FDG uptake that can be misinterpreted as suggestive of malignant conditions.

Case presentation

A 64-year-old Caucasian female patient who underwent surgery for the excision of a lung adenocarcinoma 4 years earlier and suffering from endometrial carcinoma was referred to our Institution for the evaluation and management of a 16x12 mm left maxillary sinus mass detected by 18F-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET), which demonstrated significantly increased FDG uptake (maximum standard uptake value [SUVmax], 18.5) (fig. 1) highly suggestive for a malignant process, probably of metastatic nature. Subsequently the patient underwent paranasal sinus MR imaging, which showed a well-demarcated mass arising from the lateral wall of left maxillary sinus, characterized by a typical "cerebriform" pattern on T2-weighted and fat-suppressed contrastenhanced T1-weighted MR images (fig. 2), suggestive of a Schneiderian papilloma. Moreover, the presence of foci of spontaneous hyperintensity on T1-weighted images suggested an oncocytic histotype (fig. 2b). Microscopic evaluation revealed a lesion with an exophytic and endophytic growth pattern with a multilayered columnar epithelium composed of oncocytic cells with abundant eosinophilic granular cytoplasm, microcysts and neutrophil microabscesses (figs. 3a, 3b, 3c). A diagnosis of sinonasal papilloma oncocytic type was made.

Figures

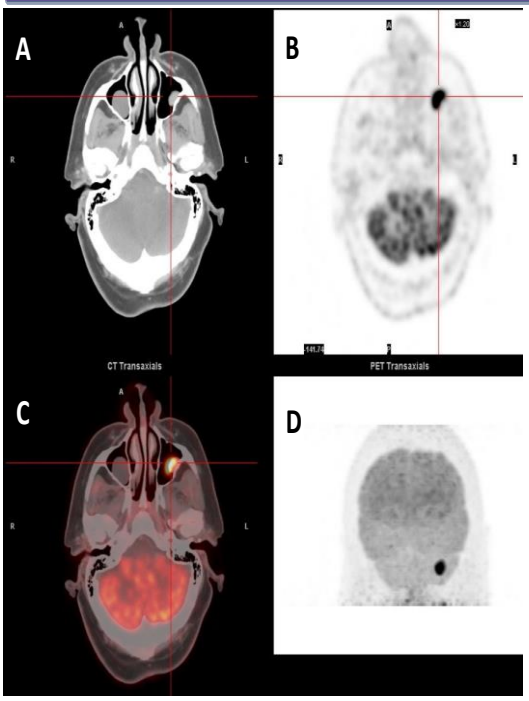

Figure 1. Axial CT (A), PET (B), and Fusion (C) images demonstrate a focus of intensely increased FDG uptake corresponding to a soft-tissue attenuation area projecting off the epithelial surface of the left maxillary sinus, highly suggestive of a malignant process.

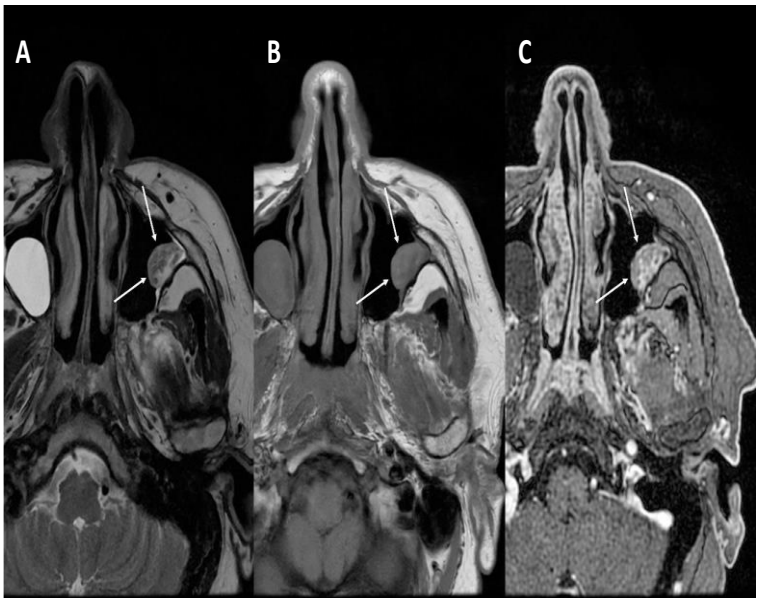

Figure 2. *MRI shows a well-demarcated mass arising from the lateral wall of left maxillary sinus (white arrows) characterized by heterogeneous signal with a typical "cerebriform" pattern on axial T2weighted (A) and axial fat-suppressed contrast-enhanced (C) images. Spontaneous T1 hyperintensity (B) correlates with an oncocytic subtype.*

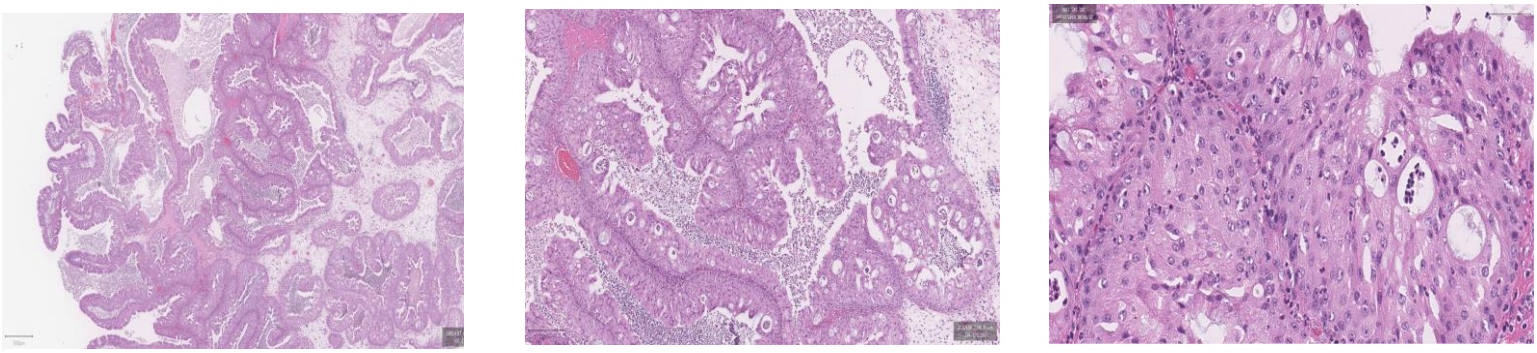

Figure 3. *Oncocytic sinonasal papilloma at low power demonstrates inverted and exophytic growth pattern (A). The lining epithelium is pseudostratified and columnar composed by cell with granular eosinophilic cytoplasm and regular, round nuclei (B). Transmigrating neutrophils and microabscesses are seen (C).*

Conclusion

The high absorption of FDG is usually associated with malignant neoplasms. Nevertheless, increased FDG uptake is not solely limited to malignant lesions. As reported in our case, Schneiderian papillomas, which are rare benign tumors of the nasal cavity and paranasal sinuses, demonstrate significantly increased FDG uptake, making differentiation from the malignancy more difficult. MRI is a useful tool that helps in more precise identification of the lesion.

References

1. Kraft M, Simmen D, Kaufmann T, Holzmann D. Long-term results of endonasal sinus surgery in sinonasal papillomas. Laryngoscope. 2003 Sep;113(9):1541-7. doi: 10.1097/00005537-200309000-00025. PMID: 12972931.
2. Vorasubin N, Vira D, Suh JD, Bhuta S, Wang MB. Schneiderian papillomas: comparative review of exophytic, oncocytic, and inverted types. Am J Rhinol Allergy. 2013 Jul-Aug;27(4):287-92. doi: 10.2500/ajra.2013.27.3904. PMID: 23883810; PMCID: PMC3901443.
3. Thompson LDR, Franchi A. New tumor entities in the 4th edition of the World Health Organization classification of head and neck tumors: Nasal cavity, paranasal sinuses and skull base. Virchows Arch. 2018 Mar;472(3):315-330. doi: 10.1007/s00428-017-2116-0. Epub 2017 Apr 25. PMID: 28444451.
4. Bishop JA. OSPs and ESPs and ISPs, Oh My! An Update on Sinonasal (Schneiderian) Papillomas. Head Neck Pathol. 2017 Sep;11(3):269-277. doi: 10.1007/s12105-017-0799-9. Epub 2017 Mar 20. PMID: 28321771; PMCID: PMC5550400.
5. Lisan Q, Laccourreye O, Bonfils P. Sinonasal inverted papilloma: From diagnosis to treatment. Eur Ann Otorhinolaryngol Head Neck Dis. 2016 Nov;133(5):337-341. doi: 10.1016/j.anorl.2016.03.006. Epub 2016 Apr 1. PMID: 27053431.
6. Glâtre R, De Kermadec H, Alsamad IA, Badoual C, Gauthier A, Brugel L, Parra C, Coste A, Prulière-Escabasse V, Bequignon E. Exophytic sinonasal papillomas and nasal florid papillomatosis: A retrospective study. Head Neck. 2018 Apr;40(4):740746. doi: 10.1002/hed.25042. Epub 2018 Jan 17. PMID: 29341451.
7. F.Y. Lin, E.M. Genden, W.L. Lawson, P. Som and L. Kostakoglu. High Uptake in Schneiderian Papillomas of the Maxillary Sinus on Positron-Emission Tomography Using Fluorodeoxyglucose American Journal of Neuroradiology February 2009, 30 (2) 428-430; DOI: https://doi.org/10.3174/ajnr.A1264