Journal of Nuclear Medicine, published on May 25, 2023 as doi:10.2967/jnumed.123.265498

Obstructive Sialadenitis from Oral Squamous Cell Carcinoma: [^{68}Ga]Ga-FAPI-46 PET–Positive and [^{18}F]FDG PET–Negative

Peter George Maliha[1], Abie H. Mendelsohn[2], Johannes Czernin[1], Taylor Howard[3], Jeremie Calais*[1], and Masatoshi Hotta*[1]

[1]Ahmanson Translational Theranostics Division, Department of Molecular and Medical Pharmacology, UCLA, Los Angeles, California; [2]Department of Head and Neck Surgery, UCLA, Los Angeles, California; and [3]Department of Pathology, UCLA, Los Angeles, California

A 67-y-old nonsmoker woman with no prior history of head or neck surgery or radiation therapy presented with a growing ulcerative right floor-of-mouth mass with increasing tenderness, otalgia, and minimal intermittent bleeding. The floor-of-mouth mass biopsy was consistent with squamous cell carcinoma, and the patient underwent a preoperative ^{68}Ga-fibroblast activation protein inhibitor ([^{68}Ga]Ga-FAPI)-46 PET/CT study (injected activity, 151.7 MBq [4.1 mCi]) under the prospective study NCT04147494. The preoperative [^{18}F]FDG PET/CT study (injected activity, 407 MBq [11.0 mCi]) revealed intense uptake (SUV_{max}, 12.8) in the anterior paramedian right primary tumor and mild uptake (SUV_{max}, 1.6–3.4) in several subcentimeter bilateral neck nodes (stage T2N2cM0). The subsequent [^{68}Ga]Ga-FAPI-46 PET/CT study revealed intense uptake (SUV_{max}, 12.6) in the primary lesion and moderate uptake (SUV_{max}, 5.4) in 1 right neck node (also [^{18}F]FDG-avid; SUV_{max}, 2.4).

Interestingly, there was markedly increased [^{68}Ga]Ga-FAPI-46 uptake (SUV_{max}, 8.1) in the right submandibular gland (SMG) and mildly increased uptake in the left SMG (SUV_{max}, 4.0), with no associated abnormal [^{18}F]FDG uptake. The patient did not report salivary gland tenderness or xerostomia. The oral squamous cell carcinoma was located along the course of both Wharton ducts, more pronounced on the right side. The increased [^{68}Ga]Ga-FAPI-46 uptake in the SMGs reflected changes caused by obstructive sialadenitis, confirmed on histopathology after resection of the oral squamous cell carcinoma and bilateral neck dissections, including total right and partial left SMG resections (Fig. 1). Immunohistochemistry of the SMGs revealed strong fibroblast activation protein expression in the right gland and overall weak expression in the left gland.

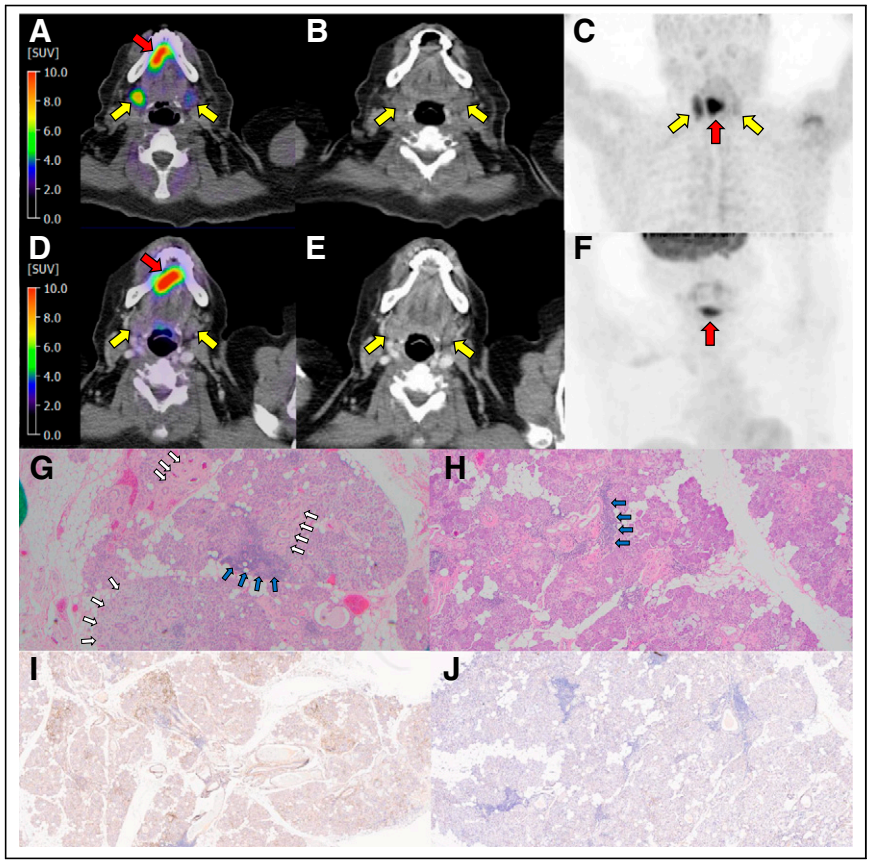

FIGURE 1. (A–F) Axial fused (A and D), axial CT (B and E), and maximum-intensity-projection (C and F) [^{68}Ga]Ga-FAPI-46 PET/CT (A–C) and [^{18}F]FDG PET/CT (D–F) images demonstrating increased [^{68}Ga]Ga-FAPI-46 uptake in both SMGs, right more than left, and normal [^{18}F]FDG uptake in both SMGs (yellow arrows). Primary SCC was intensely avid for [^{68}Ga]Ga-FAPI-46 and [^{18}F]FDG (red arrows). (G and H) Hematoxylin and eosin staining of right (G) and left (H) SMGs revealing lymphoplasmocytic infiltration bilaterally (blue arrows) and fibrosis in right SMG (white arrows). (I and J) Immunohistochemistry of SMGs revealing strong fibroblast activation protein expression in right gland (I) and overall weak expression in left gland (J).

Received Jan. 24, 2023; revision accepted Mar. 30, 2023.
For correspondence or reprints, contact Jeremie Calais (jcalais@mednet.ucla.edu).
*Contributed equally to this work.
Guest Editor: David A. Mankoff, University of Pennsylvania
Published online May. 25, 2023.

DOI: 10.2967/jnumed.123.265498

Histologically, chronic obstructive sialadenitis is characterized by acinar atrophy, lymphocytic infiltrates, and fibrosis (*1*). In this case, inflammatory cells were observed in both SMGs. Fibrotic cells were also observed bilaterally but predominantly in the right SMG. The [^{68}Ga]Ga-FAPI-46–positive/[^{18}F]FDG-negative pattern observed in the SMGs may be explained by an active fibrotic process with fibroblast activation protein expression (*2*) rather than an active inflammatory process. Chronic sialadenitis appears to be an additional oncologic imaging pitfall on [^{68}Ga]Ga-FAPI-46–targeting radiopharmaceutical PET, potentially mimicking metastases.

DISCLOSURE

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Teymoortash A, Tiemann M, Schrader C, Werner JA. Characterization of lymphoid infiltrates in chronic obstructive sialadenitis associated with sialolithiasis. *J Oral Pathol Med.* 2004;33:300–304.
2. Hotta M, Rieger AC, Jafarvand MG, et al. Non-oncologic incidental uptake on FAPI PET/CT imaging. *Br J Radiol.* 2023;96:20220463.