Parathyroid adenoma mimicking cervical recurrence on CT/PET fusion scan

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A 47-year-old man presented to his primary care physician with right-sided otalgia. Examination detected an enlarged right tonsil, which was subsequently unresponsive to two courses of antibiotics. On biopsy, the patient was found to have moderately differentiated squamous cell carcinoma of the right tonsil.

The patient was treated with primary chemoradiation. Six months following the completion of treatment, he was found to have fullness of the right tonsillar fossa. A right tonsillectomy for biopsy purposes revealed squamous cell carcinoma. A composite resection of the right oropharynx with neck dissection and fibular free-flap reconstruction was performed. Metastatic lymph nodes were not found in the surgical specimen, and the surgical margins were clear around the primary tumor.

One year later, the patient underwent routine computed tomography/positron-emission tomography (CT/PET) as part of follow-up tumor surveillance. CT/PET demonstrated a markedly increased uptake in the tracheoesophageal groove at the level of the cricoid cartilage in the right neck (figure). This 1.0 × 1.6-cm mass was first thought to represent a cervical recurrence. Image-guided fine-needle biopsy was suggested, but the patient declined. Instead, he went straight to direct laryngoscopy, esophagoscopy, and neck exploration with removal of the neck mass. Pathologic evaluation of the surgical specimen revealed that it was a parathyroid adenoma; no sign of squamous cell carcinoma was seen.

CT/PET image fusion has become a widely used modality for head and neck cancer surveillance after primary treatment. Conventional CT and magnetic resonance imaging are less effective in detecting early recurrences following surgery or radiation because of the loss of normal tissue planes. PET relies on changes in tumor metabolism to detect recurrences, but it is limited by a lack of anatomic detail. The fusion of the two modalities has led to an improvement in localization and a reduction in the number of equivocal PET interpretations.

Yet despite its advantages, CT/PET is unable to reliably differentiate malignant tumors from benign tumors. For example, the case described herein illustrates how CT/PET is not specific for malignant tumors. As a result of increased metabolism, PET also detects parathyroid adenomas. Therefore, the results of CT/PET studies for tumor surveillance should be augmented by other studies, such as image-guided biopsies, for appropriate management of head and neck cancer patients; maintaining a high clinical suspicion of recurrence is also wise. In view of our patient's history of squamous cell carcinoma with a previous recurrence, we decided that neck exploration was necessary.