Case Report: Mucoepidermoid Carcinoma of the Parotid Gland after Radioiodine Therapy for Thyroid Cancer

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Abstract

Background: Mucoepidermoid carcinomas are malignant epithelial neoplasms that usually originate in the salivary glands. Secondary malignancies associated with radioiodine treatment are rare, but reported by some authors to be increasing in incidence. Here, we describe the 4th report of a patient developing mucoepidermoid carcinoma of the salivary gland following radioactive iodine treatment for thyroid cancer.

Patient Findings and Summary: A 46 year old woman was found to have a 1 cm nodule behind her right ear on physical exam on a follow up visit. Eight years prior, she underwent total thyroidectomy and 150 mCi of 131I for Papillary Thyroid Cancer. Workup of the nodule revealed a solid tumor by MRI and the patient had surgical excision of the mass. Pathology was consistent with low-grade mucoepidermoid carcinoma of the parotid gland.

Conclusion: There is increasing evidence that 131I is not as innocuous as the scientific community previously believed, and that there may be an increasing risk of secondary primary malignancies associated with radioiodine treatment. Although some of these associations have been controversial in the literature, a relevant number of cases are appearing in the field.

Patient

This is a case of a 46 year-old woman who was diagnosed with Stage I Papillary Thyroid Cancer (T4 N1b M0) 10 years ago status post total thyroidectomy and ablative treatment with 150 mCi of 131I. She was treated with levothyroxine 175 mcg for TSH suppression. Her serum thyroglobulin and thyroglobulin antibodies remained undetectable. Thyrotropin alpha-stimulated whole body scans and thyroglobulin levels were negative. Surveillance ultrasounds also failed to show evidence of residual thyroid tissue or locally metastatic disease.

The patient’s other medical problems include incomplete right bundle branch block with recurrent syncope. Her medications include levothyroxine, as mentioned, calcium/vitamin D and a multivitamin. The patient has no history of smoking, ethanol or illicit drug abuse. There is no family history of cancer diagnoses.

Eight years after her initial treatment, during a routine visit, a right-sided 1.0 x 0.8 cm firm mass located at the angle of the jaw was found on exam. This was further evaluated with an MRI with and without contrast, which revealed a 1.2 cm x 1.1 cm mass in the lateral lobe of the right parotid gland, considered to be most likely a node, but that could represent a parotid tumor (clearly not a cyst or an abscess).

The patient proceeded to have complete surgical excision of this mass.

The pathology was reported as a low-grade mucoepidermoid carcinoma of the parotid gland measuring 0.9 cm in its largest dimension.

Discussion

Three cases have been previously described in the literature of mucoepidermoid carcinomas of the salivary glands after radioiodine treatment, (1,2,3). The first case was described in 1994 by Rodríguez-Cuevas et al in which a patient developed mucoepidermoid carcinoma of the parotid gland three years and five months after receiving 100 mCi of 131I. Henze et al reported 2 more cases in 1997 and 2001 of the same phenomena with larger radioiodine doses. The first patient developed mucoepidermoid carcinoma of the submandibular gland twenty-one years after her last radioactive iodine treatment [cumulative dose of 19.2 GBq (518 mCi)] (2,3) and the second patient developed the same tumor in the parotid gland 6 months after her last radioiodine treatment [cumulative dose of 32.2 GBq (869 mCi)] (3).

It is important to note that the radiation dose received by the salivary glands in patients who have already had a thyroidectomy is usually about 10 times greater than that of other organs. (4)

Several articles have been published about the risk of multiple secondary primary malignancies associated with radioactive iodine with varying results (5,6,7). Most recently, an analysis of the Surveillance, Epidemiology, and End Results (SEER) database was used to determine the risk of secondary primary malignancies (SPM) after RAI for well differentiated thyroid cancer (WDTC) (7). The authors found an increased risk for cancers of the salivary glands, skin, and kidneys, along with an increased risk of lymphoma and leukemia. A standardized incidence ratio (SIR) of 3.84 (95% CI, 1.66-7.56) was found for salivary gland tumors, and this was even greater for patients with low-grade WDTC receiving RAI.

This case highlights the importance of understanding that the potential risks of radioactive iodine are significant, and that we should take them into account when following our patients who have received moderate to high doses of 131I.

References:


After surgical excision, no further treatment was warranted. The patient has not had a recurrence in the last 3 years.