INTERNAL MEDICINE

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Accumulations in the Salivary Gland Due to Tc-99m Pertechnetate Imaging Improved after Isotope Therapy for Graves' Disease

Toshio Kahara [1], Ken-ichi Nakajima [2], Kozo Takahashi [3], Noriko Iwaki [1], Takatoshi Michigishi [2] and Rika Usuda [1]

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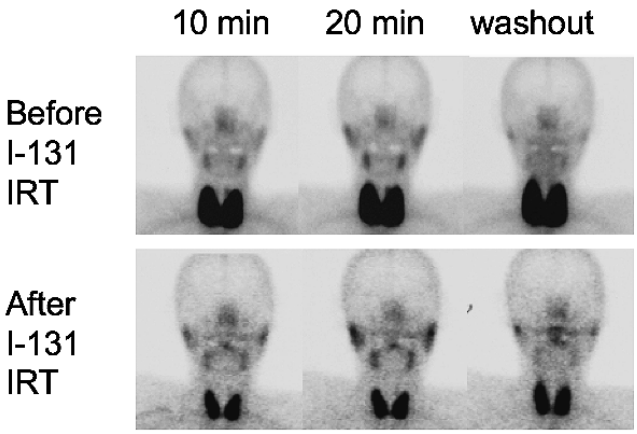
Graves' disease can complicate Sjögren's syndrome (1), and some cases can demonstrate persistent sicca syndrome despite normalization of thyroid functions. We report a case in which isotope therapy for Graves' disease contributed to the improvement of accumulations in the salivary gland due to Tc-99m pertechnetate imaging.

A 71-year-old man was referred to a local hospital because of xerostomia and dyspnea on effort in February 2005. Congestive heart failure and thyrotoxicosis due to Graves' disease were diagnosed. He was treated with diuretic drugs and methimazole, and congestive heart failure was improved. However, methimazole treatment was discontinued because agranulocytosis appeared, and he was referred to our hospital for isotope therapy in March 2005. The complaint of xerostomia was persistent, and the patients demonstrated a mouth hemorrhage due to xerostomia during physical examination, but there was no keratoconjunctivitis sicca (Schirmer test; 15 mm). Laboratory findings showed thyrotoxicosis and thyroid-associated autoantibodies were positive (TSH <0.01 μIU/ml, free T3 9.6 pg/ml, free T4 3.8 ng/dl, anti-thyroglobulin antibody 42.1 U/ml, anti-thyroid peroxidase antibody 23.3 U/ml, TSH receptor antibody 47.5 IU/l). Antinuclear antibody was x40, and both anti-SS-A/Ro and anti-SS-B/La antibodies were negative. There were no findings of agranulocytosis (WBC 5,600/μl, neutrophils 51.5%), and hematocrit was 36.1%; plasma osmolality, 288 mOsm/kg; and urinary osmolality, 592 mOsm/kg. He was treated with isotope therapy in April 2005 (single oral dose of iodine-131 was 9.25 mCi, 24-hour iodine-131 uptake was 57% and absorbed dose was 123.6 Gy). His complaint of xerostomia improved gradually, and hematocrit was 35.3%; plasma osmolality, 290 mOsm/kg; and urinary osmolality, 599 mOsm/kg in May. Thyroid hormone reached normalization and TSH receptor antibody level increased in July (TSH 0.01 μIU/ml, free T3 1.9 pg/ml, free T4 0.9 ng/dl, TSH receptor antibody 394.7 IU/l). As shown in Fig. 1, accumulations on salivary gland scintigraphy using Tc-99m pertechnetate in August were improved after isotope therapy. The right and left parotid counts divided by background count increased as shown in the table of Fig. 1.



Mean parotid count / Background	10 min	20 min
Before	R 1.34, L 1.03	R 1.88, L1.52
After	R 1.70, L 1.26	R 2.60, L 2.22

Figure 1. Salivary gland scintigraphy performed before (March 2005) and after (August 2005) iodine-131 internal radiation therapy (I-131 IRT). Anterior images obtained at 10 and 20 minutes after intravenous injection of Tc-99m, and at 5 minutes after washout by Vitamin C are shown. Original scintigraphy was performed as a dynamic study with 1 min/frame. Significantly higher accumulation was observed in both parotid glands after I-131 IRT. Tracer washout into the oral cavity was also higher after the I-131 IRT. For comparison of function before and after I-131 IRT, the right and left parotid counts divided by background count are shown in the table, in which the background was defined as the average submandibular count just after washout. The improved function after I-131 IRT was also supported by the quantification.

Patients with hyperthyroidism and congestive heart failure can develop thirst due to dehydration, and that symptom can be improved by this treatment. However, his complaint was not thirst but xerostomia, and neither hematocrit nor plasma osmolality were changed in this patient after isotope therapy.

Iodine is also absorbed by the salivary glands as well as by the thyroid (2). After high-dose radioiodine therapy, 35.4% patients who had normal salivary gland scintigraphy

[1]Department of Internal Medicine, Toyama Prefectural Central Hospital, Toyama, [2]Department of Biotracer Medicine, Kanazawa University Graduate School of Medical Science, Kanazawa and [3]Department of Japanese Oriental Medicine, Toyama Prefectural Central Hospital, Toyama
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Correspondence to Dr. Toshio Kahara, kchizu1230@yahoo.co.jp; kahara@f6.dion.ne.jp

previously showed reduced salivary gland function for three years on follow-up examinations (3). However, the present case showed improved accumulations on salivary gland scintigraphy after isotope therapy, though the follow-up of this case is still short.

Coll et al reported that 20% of patients with Graves' disease were complicated with Sjögren's syndrome (4). Pathological findings in both Sjögren's syndrome and autoimmune thyroid disease demonstrate lymphocyte infiltrations, and there may be a common autoimmune mechanism involved in the onset of both disorders. As compared with other forms of antithyroid therapy, radioiodine therapy is more likely to be followed by the development or exacerbation of Graves' ophthalmopathy (5). There is a report that isotope therapy influences cytokine production in Graves' disease, and the cytokine production can influence autoantibody levels and disease manifestations such as Graves' ophthalmopathy (6). Therefore, it seems that isotope therapy indirectly influences certain organs beyond the thyroid gland through effects on the immune system.

Here, we report a case in which isotope therapy contributed to the improvement of accumulations on salivary gland scintigraphy. The accumulation of similar cases is required to clarify whether isotope therapy is effective for Graves' disease with xerostomia.

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