False-positive orbital uptake on ^{131}I scintigraphy due to ocular prothesis

To the Editor: After ^{131}I radioablative treatment, ^{131}I whole body scintigraphy shows the degree of ^{131}I uptake and determines the metastases. Extra-thyroidal ^{131}I accumulation does not always imply thyroid cancer metastases [1]. In order to avoid unnecessary therapeutic interventions it is extremely important to properly distinguish false-positive sites of ^{131}I localization [2]. In this case, we present false-positive orbital ^{131}I uptake due to the presence of ocular prothesis .

A 75 year old man with ocular prothesis in the left orbit underwent total thyroidectomy for papillary thyroid cancer and ablation therapy with 3700 MBq therapeutic dose of ^{131}I. Whole body scintigraphy (Fig. 1A) and lateral cranial static images (Fig. 1B) obtained 5 days after the therapeutic dose of ^{131}I revealed three areas of focal increased uptake in the thyroid bed compatible with residual thyroid tissues (arrow head), and a focal uptake in the left orbit (arrow). Two days later, after the removing of the ocular prothesis and cleansing of the face periodicaly, ^{131}I uptake in the left orbit was disappeared on anterior (Fig. 1C) and lateral cranial static images (Fig. 1D).

False positive findings on ^{131}I scintigraphy may result from radiopharmaceutical contamination of skin or clothing from saliva, mucus, sweat, milk, urine or faeces [3]. False positive radioiodine uptake caused by sinusitis, dacriocycstitis, meningiomas, frontal sinus mucocele, sialoadenitis, peridontal disease, lingual thyroid was described in the literature [4-11]. The lacrimal glands and drainage system normally aren't seen on ^{131}I scintigraphy [12]. This is most probably because of the low uptake and the small size of the lacrimal gland, coupled with the small volume of the tear and the low tear-flow rate, beside the high turnover rate of the tear and the patent lacrimal system [12]. The impairment of these mechanisms may explain the accumulation of radioiodine in the tears that accumulated behind ocular prothesis [12]. The increased activity is most likely caused by poor elimination of the tear due to ocular prothesis. Having knowledge of potential false positive causes of ^{131}I uptake is significant in the proper interpretation of ^{131}I scintigraphy. Ocular prothesis may cause false positive orbital ^{131}I ptake in the ^{131}I scintigraphy that may be confused with orbital or cranial metastases.

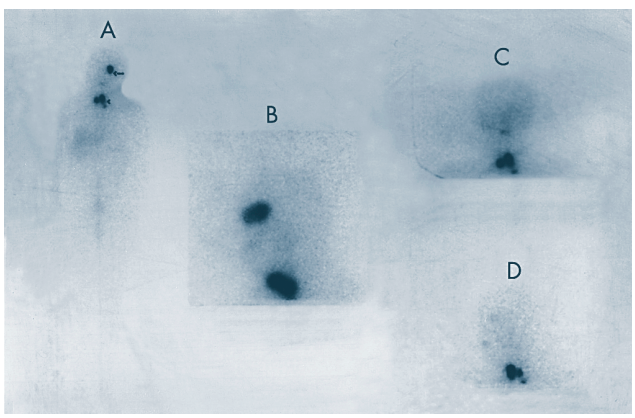

Figure 1: Whole body scintigraphy (A) and lateral cranial static images (B) obtained 5 days after the therapeutic dose of ^{131}I revealed three areas of focal increased uptake in the thyroid bed compatible with residual thyroid tissues (arrow head), and a focal uptake in the left orbit (arrow). Two days later, after the removing of the ocular prothesis and cleansing of the face periodicaly, ^{131}I uptake in the left orbit was disappeared on anterior (C) and lateral cranial static images (D).

Bibliography

1. Schmidt M, Scheidhauer K, Urbannek V et al. Metastasizing follicular thyroid carcinoma with intracranial iodine 131 uptake in brain edema due to a frontal meningioma. *Nuklearmedizin* 2000; 39: 38-39.
2. Ozguven M, Ilgan S, Arslan N et al. Unusual patterns of ^{131}I contaminations. *Ann Nucl Med* 2004; 18: 271-274.
3. Carlisle MR, Lu C, McDougall IR. The interpretation of ^{131}I scans in the evaluation of thyroid cancer, with an emphasis on false positive findings. *Nucl Med Commun* 2003; 26: 715-736.
4. Bakheet SM, Hammami MM. False positive radioiodine whole body scan in thyroid cancer patients due to unrelated pathology. *Clin Nucl Med* 1994; 19: 325-329.
5. Modoni S, Marino G, Guerra M et al. Unusual radioiodine uptake caused by metallic sutures in the skull in a patient with thyroid cancer. *Clin Nucl Med* 2000; 25: 1053-1054.
6. Matheja P, Lerch H, Schmid KW et al. Frontal sinus mucocele mimicking a metastasis of papillary thyroid carcinoma. *J Nucl Med* 1997; 38: 1022-1024.
7. Bakheet SM, Hammami MM, Powe J. Radioiodine uptake in the head and neck. *Endocr Pract* 2000; 6: 37-41.
8. Wadhwa SS, Mansberg R. Benign oral disease as a cause of false-positive iodine-131 scans. *Clin Nucl Med* 1998; 23: 747-749.
9. Shapiro B, Rufini V, Jarwan A et al. Artifacts, anatomical and physiological variants, and unrelated diseases that might cause false-positive whole-body ^{131}I scans in patients with thyroid cancer. *Semin Nucl Med* 2000; 30: 115-132.
10. Schmidt M, Dietlein M, Schröder U et al. False-positive uptake of ^{131}I in a laryngocele mimicking thyroid remnant after thyroidectomy for papillary thyroid carcinoma. *Clin Nucl Med* 2006; 31: 716-717.
11. Beaulieu S, Djang D, Minoshima S. False-positive "necklace sign" on whole-body thyroid cancer survey-a case report. *J Nucl Med Technol* 2005; 33: 42-43.
12. Bakheet SMB, Hammami MM, Hemidan A et al. Radioiodine secretion in tears. *J Nucl Med* 1998; 39: 1452-1454.

Savas Karyagar, Ercan Uyanık, Sevda S Karyagar, Rabıye Uslu

Department of Nuclear Medicine, Okmeydanı Training and Research Hospital, İstanbul, Turkey

Savas Karyagar,

Okmeydanı Training and Research Hospital Sisli, İstanbul, Turkey
Tel: 902122217777-1378 Fax: 02122109192
E-mail: skaryagar@yahoo.com