

False-positive radioiodine uptake in breasts in a female haemodialysis patient

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Introduction

The Na⁺/I⁻ symporter (NIS) is an intrinsic plasma membrane glycoprotein that mediates the active uptake of I⁻ in the thyroid and other tissues such as salivary glands, gastric mucosa and lactating mammary gland. Physiologically, NIS is expressed in the breast exclusively during gestation and lactation. In vitro and in vivo studies confirmed that lactogenic hormones, including prolactin, can induce functional NIS expression in mammary tissue. Hyperprolactinemia is common in patients with end-stage renal disease (ESRD).

Clinical case

A 42-year-old woman with papillary thyroid cancer and ESRD treated with haemodialysis underwent ¹³¹I adjuvant therapy after rh-TSH (Thyrogen®) stimulation.

After ¹³¹I application, the patient underwent dialysis sessions in the nephrology department every second day after ¹³¹I therapy. A posttherapy whole-body scan performed 96 hours after administration of 100 mCi/3700MBq ¹³¹I showed radioiodine accumulation in thyroid bed and chest (Fig. 1), that in single-photon emission computed tomography fusion imaging (SPECT/CT) was confirmed as intense and symmetrical breasts uptake (Fig. 2). The patient had her last menstruation 5 years ago and denied galactorrhoea. The prolactin level measured after ¹³¹I therapy was 100.98 ng/mL (reference range 5.18–26.53 ng/mL).

The ultrasound of the mammary glands and conventional mammography was without any abnormalities.

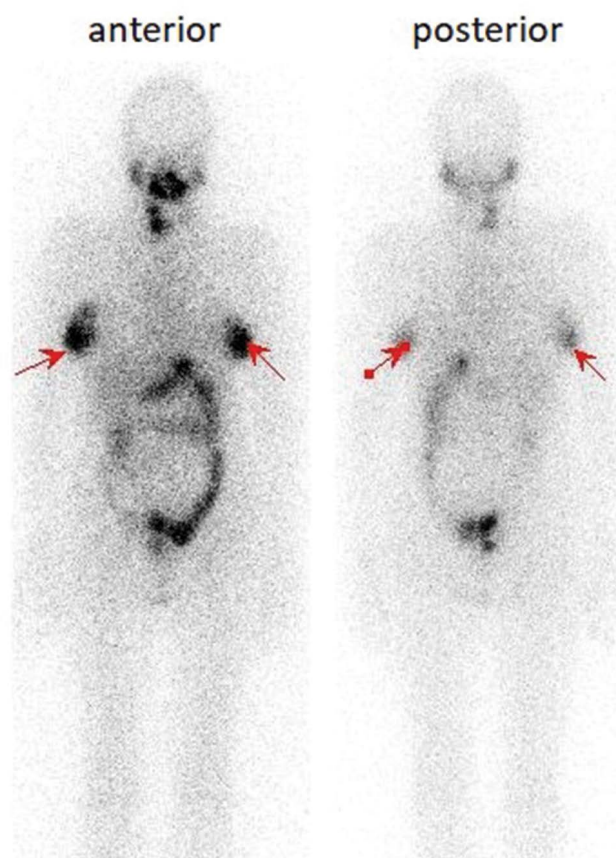


Figure 1. Post therapeutic ¹³¹I planar whole-body scan showed symmetric and intense iodine uptake in mammary glands

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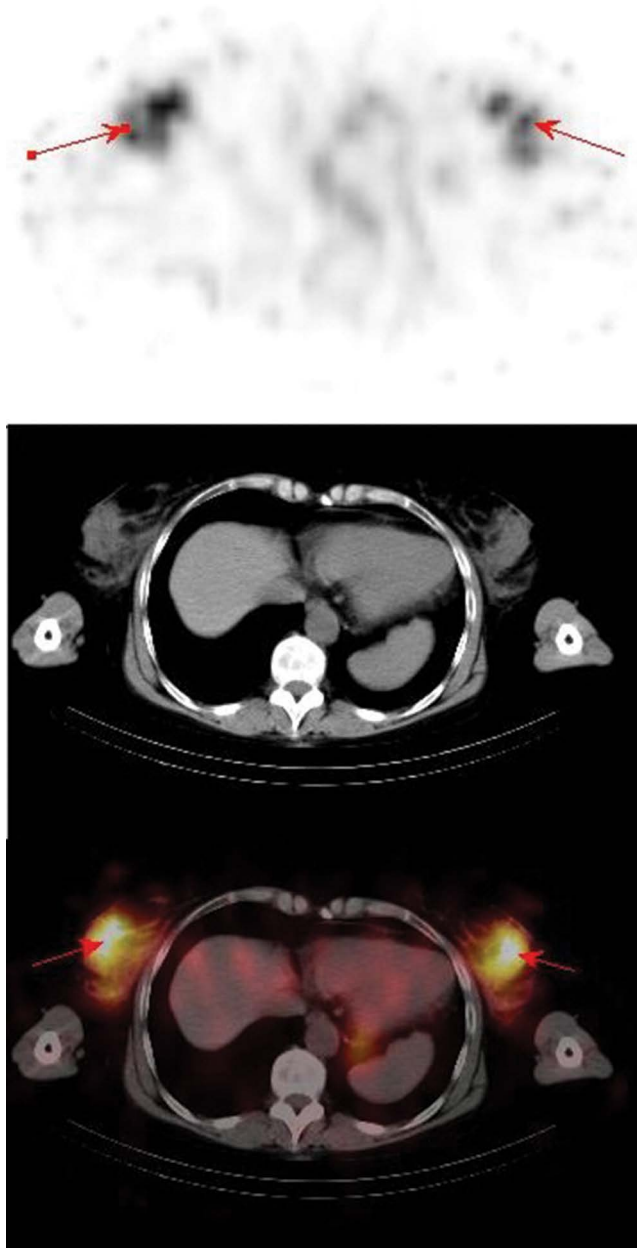


Figure 2. Image fusion of CT and iodine SPECT scan of the thoracic region clearly demonstrated the radioiodine uptake in the breasts

Discussion

Due to NIS expression in lactating mammary tissue breastfeeding is an absolute contraindication to radioiodine therapy. The time interval between completed breastfeeding and radioiodine treatment should be at least six weeks. NIS expression has been also demonstrated in benign and malignant breast lesions, however, that was not the case of the presented patient.

The major causes of hyperprolactinemia in patients with ESRD is the reduced renal clearance of prolactin (which level does not decrease significantly in response to haemodialysis) and enhanced prolactin secretion by the pituitary due to lactotrophic resistance. Although each year about 10 patients on haemodialysis are treated with radioiodine, this was the first patient on haemodialysis and radioiodine uptake in breasts. The explanation for it could be the young age of the patient since the other ones were much older (median 60 years of age). One cannot exclude that the mammary gland in younger women is more sensitive to prolactin stimulation due to the increased amount of epithelial tissue.

Prolactin measurement and stimulation of the D2 receptor with dopamine agonists should be considered in young female patients with ESRD who are planned for radioiodine treatment.

Conflict of interest

The authors report no conflicts of interest.