Radioiodine Accumulation in a Giant Ovarian Cystadenofibroma Detected Incidentally by 131-I Whole Body Scans

Mohammed Mebarki,1,2 Abdelghani Menemani,2 Abdelkader Medjahedi,1,2 Fouad Boualou,1,3 Abdelhak Slama,1,2 Sarah Ouguirti,2 Fatima Zahra Kherbouche,1,2 and Nécib Berber1,2

1 Faculty of Medicine, University of Tlemcen, Tlemcen 13000, Algeria
2 Department of Nuclear Medicine, University Hospital of Tlemcen, Tlemcen 13000, Algeria
3 Department of Surgery “A”, University Hospital of Tlemcen, Tlemcen 13000, Algeria

Case Report

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1 Faculty of Medicine, University of Tlemcen, Tlemcen 13000, Algeria
2 Department of Nuclear Medicine, University Hospital of Tlemcen, Tlemcen 13000, Algeria
3 Department of Surgery “A”, University Hospital of Tlemcen, Tlemcen 13000, Algeria

Correspondence should be addressed to Mohammed Mebarki, mmebarki2000@yahoo.fr

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Ovarian cystadenofibroma is a relatively rare tumor; it is usually asymptomatic and is found incidentally. We present the case of a 24-year-old female patient, who had undergone total thyroidectomy for thyroid papillary carcinoma, with an asymptomatic giant cystadenofibroma, incidentally discovered by diagnostic 131-I-WBSs. We summarize the clinical history, imaging data, and histopathological study on a rare case of radioiodine accumulation in cystadenofibroma, and we discuss the mechanism of uptake of radioiodine in this case.

1. Introduction

Whole-body scans (WBSs) after administration of diagnostic or therapeutic doses of 131I have a high sensitivity in detecting physiological and/or pathological uptake of radioiodine [1]. However, several unusual lesions can cause false-positive results [2, 3]. One of the main limitations of two dimensional planar 131I-WBSs imaging is its lack of anatomical details. Single photon emission computed tomography/computed tomography (SPECT/CT) can correctly localize and characterize lesions presenting radioiodine uptake [4].

We present a rare case, an incidental finding of cystadenofibroma with radioiodine accumulation on follow-up diagnostic 131I-WBSs with SPECT/CT.

2. Case Presentation

A 24-year-old female patient underwent total thyroidectomy with central and bilateral lymphadenectomy at the age of 21 years, histopathology revealed papillary thyroid carcinoma and positive lymph nodes.

She was treated with 5.55 GBq radioiodine (131I) when the serum thyroid-stimulating hormone level was 100 μIU/mL, and the serum thyroglobulin concentration was 68.7 ng/mL.

Follow-up diagnostic 131I-WBS, 72 hours after oral administration of 370 MBq of 131I, performed on a gamma camera equipped with a high-energy all-purpose parallel-hole collimator (GE Infinia Hawkeye 4 slices), revealed a large rounded focus of radioiodine accumulation in the lower abdomen and pelvis. No abnormal radioiodine uptake was seen in the neck region (Figure 1).

Low-dose-integrated SPECT-CT of the abdomen and pelvis was then performed on the same gamma camera demonstrating a very large abdominal mass in the transverse coronal and sagittal images with heterogeneous distribution of 131I throughout the tumour mass (Figure 2).

At the time of diagnostic 131I-WBS the serum TSH level was 100 μIU/mL and the serum thyroglobulin concentration was 20 ng/mL.

Gynaecological anamnesis reported menarche appeared at the age of 14, regular menstrual cycles, a two-month
**Figure 1:** A 24-year-old female patient who had undergone total thyroidectomy with central and bilateral neck dissection for papillary thyroid cancer treated with radioiodine after. Anterior and posterior whole-body planar imaging (left and right) obtained 72 hours after oral administration of a diagnostic dose of 740 MBq of $^{131}$I. They show a large rounded focus of activity in the lower abdomen and pelvis. There is no abnormal radioiodine uptake in the neck areas.

**Figure 2:** Abdominal SPECT-CT image (left, CT; middle, SPECT; right, $^{131}$I-SPECT/CT) revealed a very large abdominal mass with radioiodine accumulation in the transaxial (a) coronal (b), and sagittal (c) images. Note the heterogeneous distribution of radioiodine throughout the tumour mass.
The authors declare that they have no conflict of interests.

3. Discussion

This common benign ovarian tumor is frequently incidentally discovered in patients without clinical evidence. We describe an unusual case of incidental detection of such tumors in a $^{131}$I-WBS with SPECT-CT. Previous incidental findings of benign and malignant ovarian tumors on planar whole body scan have been described in the literature [5–9]. To our knowledge, only two previous cases of radioiodine uptake in a cystadenofibroma have been reported until March 2012. Flug et al. have reported a case of radioiodine accumulation in a large adnexal cystadenofibroma [10]. Song et al. have reported a case of false-positive $^{131}$I uptake by an ovarian serous cystadenofibroma [11].

The mechanism of radioiodine accumulation in this ovarian tumor is still poorly understood. We propose two possible theories, one based on the nonspecific radioiodine accumulation in inflamed tissues, the other based on the active transport of radioiodine due to the presence of the sodium iodide symporter (NIS) in the tumor cells [10, 11].

In conclusion, a wider use of SPECT/CT in the followup of patients with differentiated thyroid carcinoma is suggested, particularly when planar $^{131}$I-WBSs is not conclusive.

Patient clinical information and prior radiological investigations are crucial elements for WBS interpretation.

References

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