Clinical vignette

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Incidental finding of a dermoid cyst in a whole-body iodine scan: importance of using [^{131}I]SPECT/CT in the differentiated thyroid carcinoma

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Abstract

A 33-year-old female with a history of total thyroidectomy for papillary thyroid carcinoma was referred to the nuclear medicine department for ablative radioiodine therapy. Post ablation scan showed an area of intense iodine uptake on the left side of the pelvic region, corresponding to the large well-defined heterogeneous mass in the left ovary in the SPECT/CT images. The radiologic features of this lesion were compatible with a dermoid cyst, previously unrecognized. Eventually, the lesion was laparoscopically removed, and a typical dermoid cyst was confirmed through histopathologic assessment.

KEY words: papillary thyroid carcinoma; whole-body radioiodine scan; dermoid cyst; false-positive

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Introduction

A whole-body scan (WBS) with 131-radioiodine is a sensitive procedure for detecting thyroid remnants and metastatic disease in differentiated thyroid cancer. However, there are several potential pitfalls that can cause misinterpretation. This report presents the incidental finding of a dermoid cyst with radioiodine uptake on post-ablation radioiodine scan. This case underlines the importance of performing a post-ablation SPECT/CT scan in finding the potential causes of abnormal or unusual uptake patterns in 131-WBS.

Case report

The patient, a 33-year-old female with a history of total thyroidectomy for papillary thyroid carcinoma (pT1bN0aMx with extrathyroidal extension), was referred to the nuclear medicine department for ablative radioiodine therapy. At the time of radioiodine therapy (RIT), stimulated serum thyroglobulin and anti-thyroglobulin antibodies were 21 ng/mL and 36, respectively. Eight days after oral administration of 150 mCi (5550 MBq) of I-131, WBS was performed by a dual-head variable angle gamma camera (GE Healthcare) equipped with a high-energy parallel-hole collimator. The post-therapy WBS showed areas of intense iodine uptake in the midline of the neck and on the left side of the pelvic region (Fig. 1). SPECT/CT images confirmed central neck uptake in the thyroid tissue and the thyroglossal duct remnant (Fig. 2) and also localized a focal intense uptake in the left pelvic fossa to the well-defined heterogeneously mass (5 × 6 cm) in the left ovary, which was containing fat, fluid, and calcification. The radiologic features of this lesion were compatible with the teratoma ovary, previously unrecognized (Fig. 3).

In this case, due to ectopic thyroid tissue, the level of serum thyroglobulin was unreliable in the follow of the thyroid carcinoma. The metastatic papillary thyroid carcinoma or malignant transformation of the ectopic thyroid tissue cannot be distinguished from normal thyroid tissue in the ovarian cyst [1–3]. Considering this issue and unpredictable thyroglobulin level, the patient was referred

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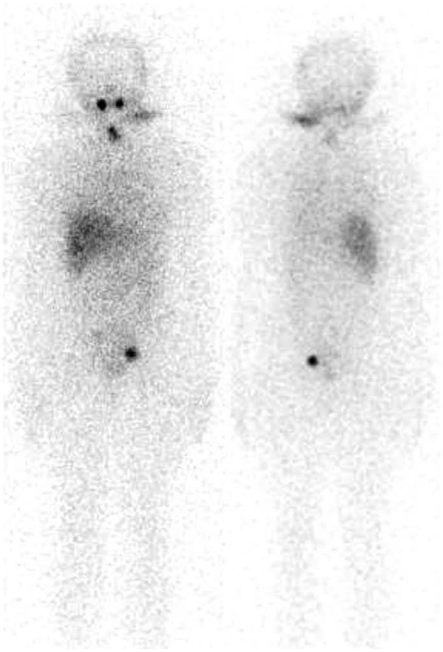

Figure 1. A whole-body iodine scan demonstrated two focal zones of radio-iodine uptake in the midline of the neck and left side of the pelvic region. Also, the scan showed Horizontal line uptake on both sides of the neck, compatible with the hair contamination in the SPECT/CT images

for surgery. The lesion was laparoscopically removed, and a typical dermoid cyst was confirmed by histopathologic assessment. Serum thyroglobulin dropped to normal levels about one month after the surgery (< 0.04 ng/mL).

Conflict of interest

The authors declare that they do not have any conflict of interest.

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Figure 2. SPECT/CT images revealed a focal zone of iodine uptake in the midline of the upper cervical region, compatible with the thyroglossal duct remnant

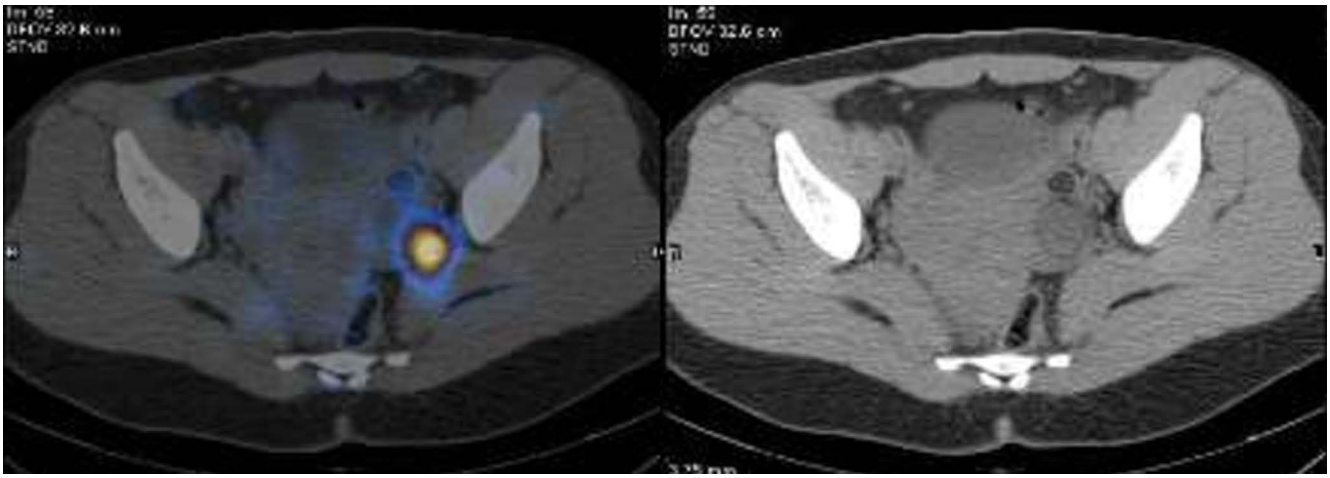

Figure 3. SPECT/CT images revealed a focal zone of iodine uptake on the left side of the pelvic cavity, corresponding to the well-defined heterogeneous mass (5 × 6 cm), which was containing fat, fluid, and amorphous calcification in the left ovary in the CT slices