CLINICAL IMAGE

Ovarian monodermal teratoma as the cause of an elevated serum thyroglobulin concentration in a patient after total thyroidectomy for papillary thyroid carcinoma

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Thyroglobulin (TG) is a glycoprotein synthesized uniquely in thyrocytes and secreted into the follicles of the thyroid gland. As the capacity for its synthesis is preserved in carcinomas originating from thyrocytes (except poorly differentiated and anaplastic carcinomas), it is a recognized tumor marker of thyroid carcinoma after total thyroidectomy.

A 42-year-old woman was referred to the Department of Endocrine Oncology and Nuclear Medicine after total thyroidectomy and central neck dissection for papillary thyroid carcinoma in the isthmus diagnosed via fine-needle biopsy. Postoperatively, a focus of a classic variant of papillary carcinoma, 7 mm in diameter, was found in the nodular goiter, along with 8 lymph nodes free of metastases (pT1aN0). The patient considered herself otherwise healthy. She had given birth to 3 children and had regular menstruation, but she had not seen a gynecologist for about 8 years. She was taking L-thyroxine at a dose of 125 μg daily.

At the visit, complete resection of the thyroid was confirmed by neck ultrasound. Blood tests were performed for evaluation of serum concentrations of thyrotropin (TSH), TG, and anti-TG antibodies. The results showed a TSH level of 0.8 mIU/l (reference range, 0.3–4.2 mIU/l); a TG level of 608.0 ng/ml (reference range, 5–40 ng/ml), and an anti-TG antibody level of 21.9 IU/l (reference range <115 IU/l). Diagnostic whole-body scintigraphy (WBS) with radioiodine 131I at an activity of 74 MBq was performed after stimulation with recombinant human TSH. Planar WBS complemented by single-photon emission computed tomography fused with low-dose computed tomography of the abdomen and pelvis showed focal radioiodine accumulation corresponding to the hypodense structure in the topography of the left ovary (FIGURE 1A and 1B). Magnetic resonance imaging of the pelvis revealed an encapsulated tumor of the left ovary (FIGURE 1C). Left adnexectomy

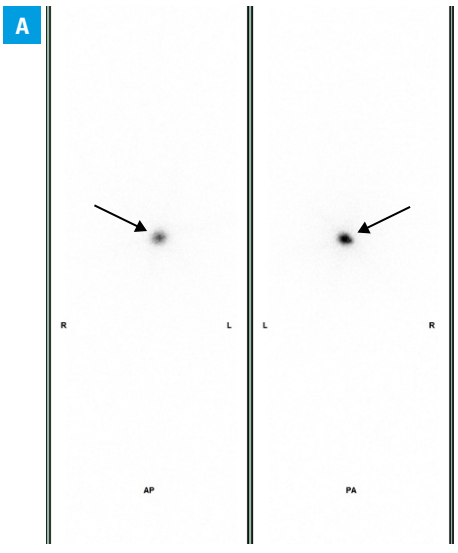

FIGURE 1 **A** – whole-body planar scintigraphy showing anterior-posterior (AP) and posterior-anterior (PA) views of the patient 72 h after administration of radioiodine 131I at a diagnostic activity of 74 MBq. Pathological radioiodine accumulation in the area corresponding to the lower part of the patient's torso is shown (arrows). The patient's silhouette is not visible on the scan due to the high intensity of iodine uptake in the pathological focus.

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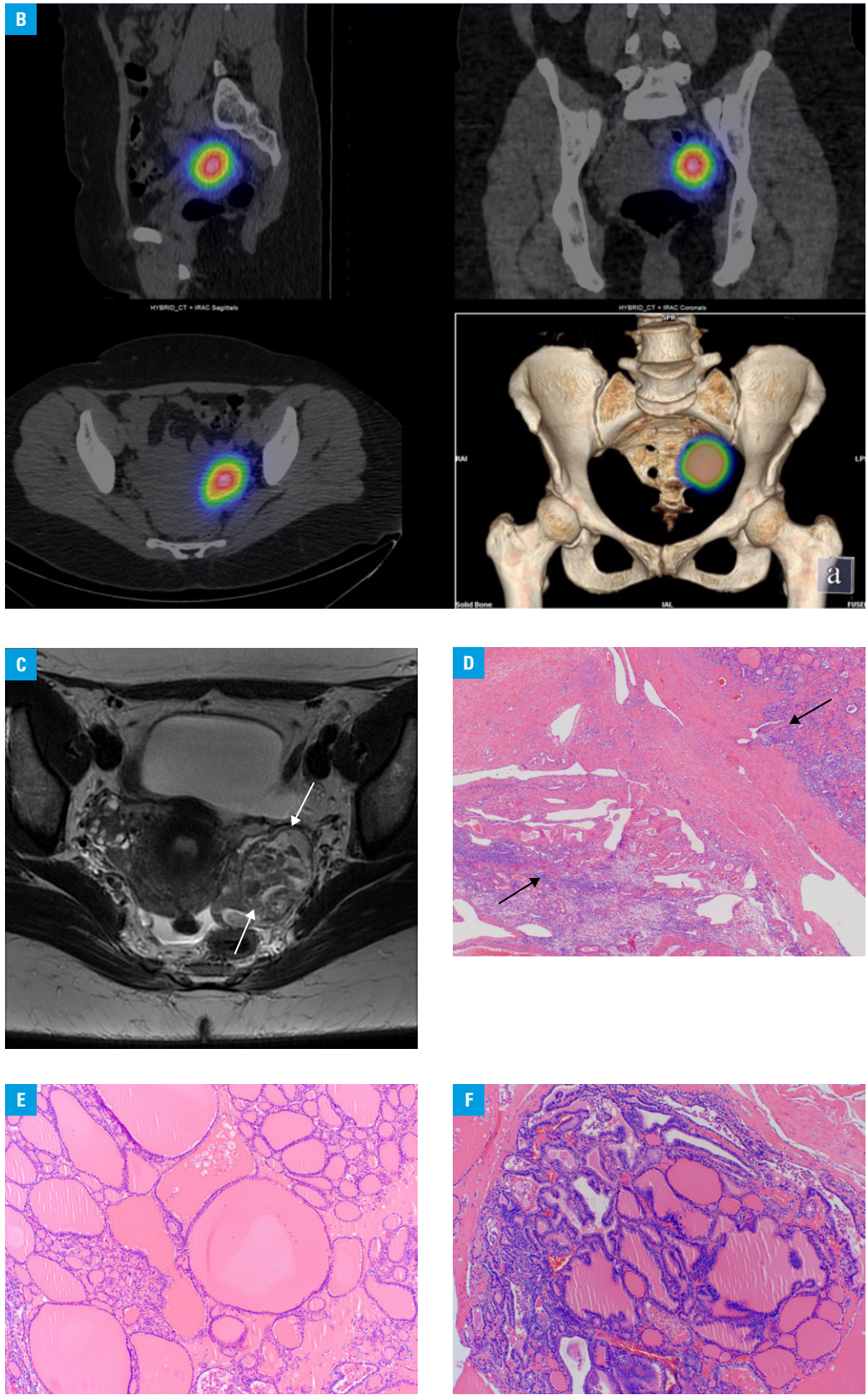

FIGURE 1 **B** – single-photon emission computed tomography (CT) fused with low-dose CT of the abdomen and pelvis; a set of reconstruction images showing focal radioiodine accumulation in the topography of the left ovary; **C** – T2-weighted magnetic resonance imaging of the pelvis showing a well-circumscribed, encapsulated tumor of the left ovary, sized 57 × 43 × 52 mm (arrows). The heterogeneous structure of the lesion is shown, with numerous follicles up to 15 mm in diameter (some of which are mucous or filled with fluid) as well as solid areas. **D–H** – pathological examination; **D** – an overview of the ovarian tumor, with visible ovarian stroma (lower left, arrow) and thyroid tissue of teratomatous origin (upper right, arrow) (hematoxylin and eosin [HE] staining, magnification × 40); **E** – thyroid-like follicles in the struma ovarii (HE staining, magnification × 100); **F** – a small focus of papillary carcinoma in the thyroid tissue; struma ovarii (HE staining, magnification × 100)

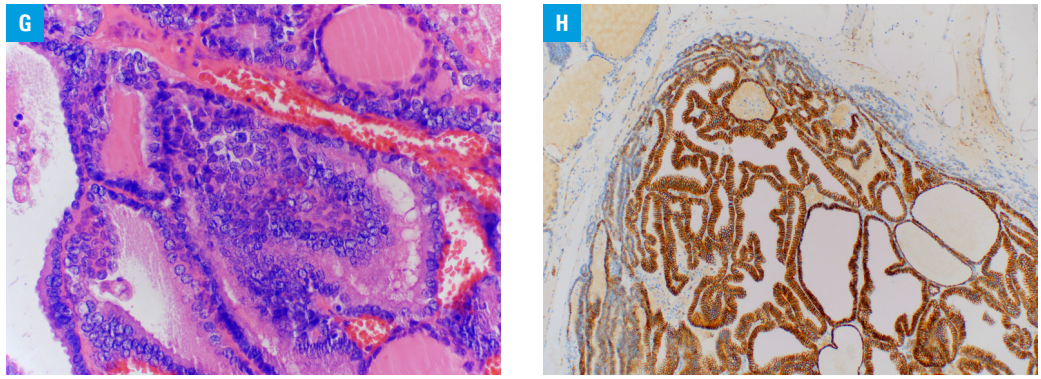

FIGURE 1 **G** – nuclear features of papillary thyroid-like carcinoma in struma ovarii (HE staining, magnification × 400); **H** – CK19 immunohistochemical staining demonstrating a strong CK19 positivity in papillary thyroid cancer cells an no staining reaction in surrounding tissues (magnification × 100)

was performed. Pathological examination revealed a tumor in the ovarian stroma, composed of follicles padded with thyrocytes and filled with colloid, comprising a focus of 4-mm papillary carcinoma of the thyroid type without signs of angioinvasion (FIGURE 1D–1H). A diagnosis of mature ovarian teratoma with a dominance of thyroid tissue and a focus of somatic malignancy was made. On WBS performed after adnexectomy, no foci of pathological accumulation of radioiodine were found. Serum concentrations of TSH, TG, and anti-TG antibodies after stimulation with recombinant human TSH were >100 mIU/l, <0.04 ng/ml, and 19.1 IU/l, respectively.

Mature cystic teratomas, which represent the most prevalent germ cell tumors of the ovary, result from neoplastic transformation of a primitive germ cell, which proliferates and forms tissues normally originating from any of the 3 embryonic germ layers. The term "struma ovarii" denotes a monodermal teratoma composed of thyroid tissue in more than 50% or a teratoma containing foci of a thyroid-type carcinoma.[1] Carcinomas of the thyroid type found in ovarian teratomas include papillary, follicular, or Hürthle cell carcinoma as well as highly differentiated follicular carcinoma of the ovary.[2] Their management is consistent with that of differentiated thyroid carcinoma and includes ovarian tumor excision followed by thyroidectomy, treatment with radioiodine, and levothyroxine therapy.[3] Synchronous papillary thyroid-type carcinoma in the thyroid and in teratoma likely represents a common genetic predisposition for this tumor formation.[4,5]

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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