CASE REPORT

Management of Gerhardt Syndrome and tracheal stenosis after polimodal treatment for thyroid papillary carcinoma

Isabela Lupu[1], Amalia Neagu[1,2], Codrut Sarafoleanu[1,2]

[1]"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

[2]ENT&HNS Department, "Sfanta Maria" Hospital, Bucharest, Romania

ABSTRACT

BACKGROUND. The papillary thyroid cancer is the most frequent thyroidian neoplasm which affects young people, being more frequent among females. Most thyroid cancers grow slowly and are associated with a very favorable prognosis. The prognosis of papillary thyroid cancer depends on age, sex and stage.

CASE REPORT. We present the case of a 25-year-old male patient known with giant goiter from 2004, diagnosed on fine needle aspiration biopsy with differentiated papillary carcinoma. The cervical and chest CT exam revealed voluminous thyroid mass, which descended in the anterior mediastinum, with anterior and middle mediastinal lymphadenopathy and metastases (micronodules) in both lungs. After tumor resection, the patient developed bilateral recurrent laryngeal nerves paralysis (Gerhardt syndrome), which required tracheostomy, postexcisional hypothyroidism and iatrogenic hypoparathyroidism. The patient underwent three sessions of radiotherapy, after which a tracheal stenosis was diagnosed; it required repeated calibration procedures using diode LASER. Due to the total motor recovery of the left vocal cord and partly of the right one, which lead to a restored laryngeal respiratory function, the closing of the tracheal stoma was possible after 2 years of treatment.

CONCLUSION. Most of the patients with papillary thyroid carcinoma can be cured, but surgical and follow-up strategy has to be in accordance with the prognostic factors and any other evidence of disease in order to improve quality of life.

KEYWORDS: papillary thyroid cancer, tracheal stenosis, Gerhardt syndrome, vocal cord paralysis, fine needle aspiration

INTRODUCTION

Papillary thyroid carcinoma (PTC) is the most common malignant thyroid tumor and represents about 80% of all thyroid malignancies[1]. This well-differentiated neoplasm type is more common in women with an age range of 15- 84 years (mean age = 49)[2]. The real cause of this cancer is unknown, but several factors have been described like: repeated irradiation of head and neck region, radiation exposure from nuclear disasters, female gender, younger age, family history of thyroid cancer or genetic factors[3].

The most common sign of thyroid carcinoma is an asymptomatic, palpable, slow growing, fixed nodule or mass in the anterior cervical region. Other symptoms like laterocervical adenopathy, dysphagia, hoarseness, cough or dyspnea are the cause of loco-regional tumor extension[4]. 10-15% of patients have distant metastases in lungs and bone at diagnoses and, initially, they are evaluated for pulmonary or osteoarticular symptoms[5]; signs of hyperthyroidism (or hypothyroidism) are not observed, but higher levels of thyroxine, triiodothyronine and thyroid-stimulating hormone (TSH) may indicate thyroid dysfunction[6].

Thyroid cancer is investigated based on history and physical examination. The diagnosis is established through a sensitive method - the fine needle aspiration biopsy (FNAB). Thyroid scintigraphy (or thyroid scanning), performed with technetium Tc 99m pertechnetate (99mTc) or radioactive iodine (iodine I 131 or iodine I 123), has to be made before and after surgery to assess the local and distant extension of the disease and treatment efficacy[7].

Surgery is the treatment of choice in thyroid cancer (subtotal or total thyroidectomy), which can be associated with radioiodine therapy, chemotherapy with cis-

Corresponding author: Isabela Lupu
e-mail: isabela_ lupu@yahoo.com

platin or doxorubicin in case of recurrent or advancing disease and long-term thyroid hormone replacement, levothyroxine[8].

CASE REPORT

We present the case of a 25-year-old male diagnosed with giant goiter in 2004 and who presented with bilateral cervical lymphadenopathy in 2010.

The ENT clinical evaluation, as well as the laryngofibroscopic examination, revealed a right vocal fold paralysis in midline position and a left vocal fold with a slight side motion.

Before surgery, a contrast-enhanced cervical and chest CT scan was performed. The cervical CT scan revealed a heterogeneous, anfractuous thyroid mass of 4.69/10.46/8.92 cm in size, with central calcification (Figure 1). At the same time, the chest CT scan showed an anterior mediastinal mass with anterior and middle mediastinal lymphadenopathy, associated with micronodules distributed bilaterally throughout both lungs (Figure 2).

Scintigraphy with radioactive iodine described an increased uptake in the thyroid tissue and different pulmonary areas (Figure 3).

The positive diagnose was established after the fine needle aspiration biopsy (FNAB) result – well-differentiated papillary carcinoma with homolateral isostructural metastasis (Figure 4).

Due to the extension of the disease, a multidisciplinary team, including otolaryngologists and thoracic

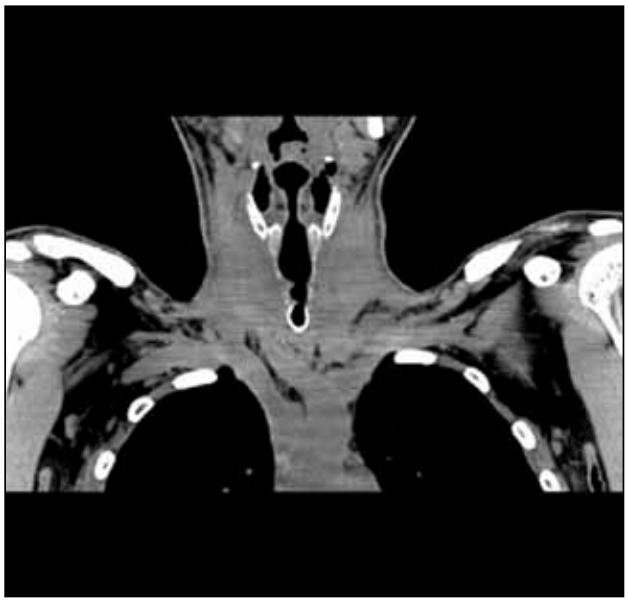

Figure 1 Cervical CT scan, coronal slice - heterogeneous, anfractuous thyroid mass with central calcification

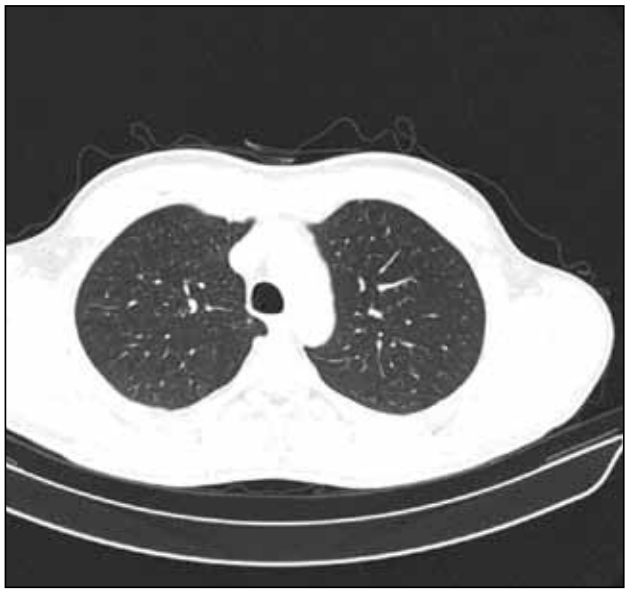

Figure 2 Chest CT scan, axial slice - mediastinal lymphadenopathy and micronodules distributed bilaterally throughout both lungs.

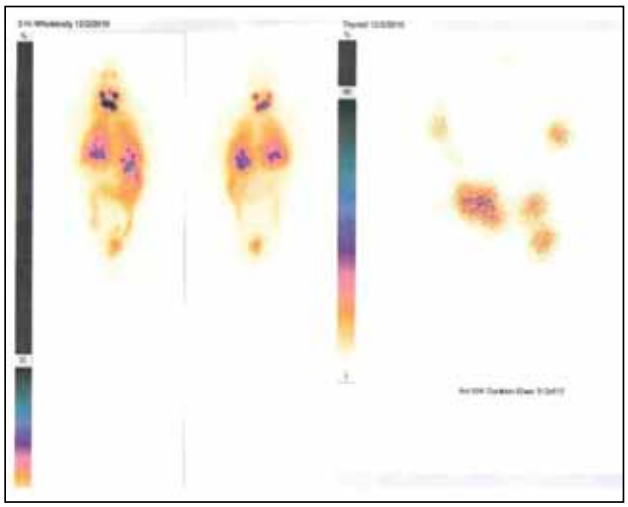

Figure 3 Scintigraphy with radioactive iodine result - increased uptake in the thyroid tissue and different pulmonary areas

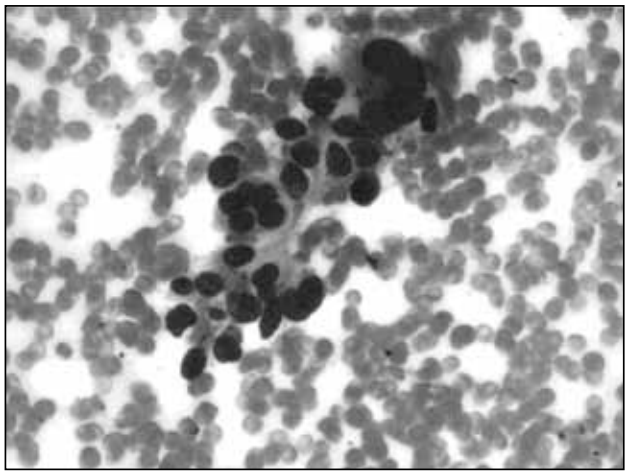

Figure 4 Histopathological aspect of thyroid papillary carcinoma - cubical cells with papillary extensions, with pale cytoplasm, compact nucleus, intranuclear inclusions (Orphan Annie cells) and psammoma corps.

surgeons, was needed. A double surgery approach was performed, which consisted of a total thyroidectomy with radical neck dissection by cervical classic approach and mediastinal lymph nodes removal by mediastinal robotic approach (thoracoscopy). Because of the recurrent laryngeal nerves paralysis gained after surgery – iatrogenic right cord paralysis, tracheostomy was performed two days later.

Six weeks after surgery, the radiotherapy was initiated. The patient underwent three sessions of radiotherapy, a total dose of 350 mCI.

The scintigraphy performed after the treatment revealed no uptake in anterior cervical and chest areas (Figure 5).

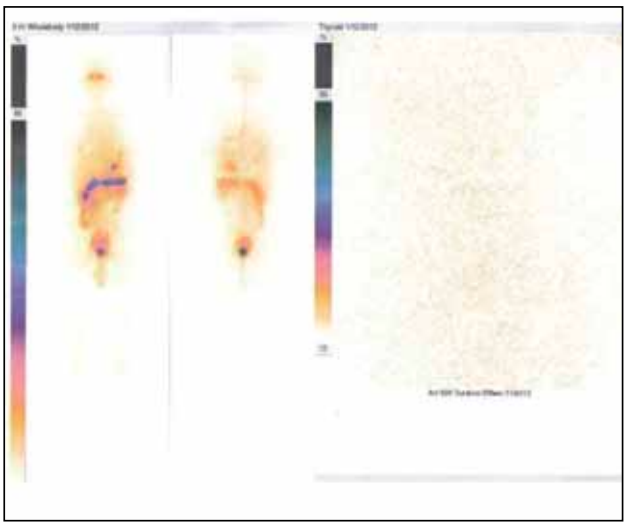

Figure 5 Scintigraphy results after radiotherapy

Due to the long-term intubation, associated later on with radiation sessions, the patient was diagnosed in 2011 with subglottic tracheal stenosis (15 mm in length and 10 mm thick) (Figure 6), for which repeated scar tissue diode laser vaporization was needed. (9)

The laryngofibroscopic examination performed after treatment (June 2012) revealed a quasi-normal tracheal recalibration (Figure 7), left vocal cord with normal mobility in phonation and hypomobile right vocal cord. These slow and partial reinnervation and regeneration phenomena of the vocal cords were possible because the reduction in motor function after surgery was due to neuropraxis or axonotmesis.

The revaluation performed after five months showed no signs of thyroid tumor recurrence and a restored respiratory function.

DISCUSSIONS

Papillary thyroid cancer is the most common type of thyroid cancer[2]. The pathogenesis is not well known, but requires genotype interaction with environmental triggers, like ionizing radiation and alterations in iodine metabolism. At genetic level, it produces multiple changes, including mutant proto-oncogenes (RET, TRK-A) and structural chromosomal damages (deletions 11p, 3p)[10].

RET proto-oncogene encodes a receptor for tyrosine-kinase of cytoplasm membrane, located on chromosome 10. This RET rearrangement generates transforming genes involved in papillary thyroid carcinoma.

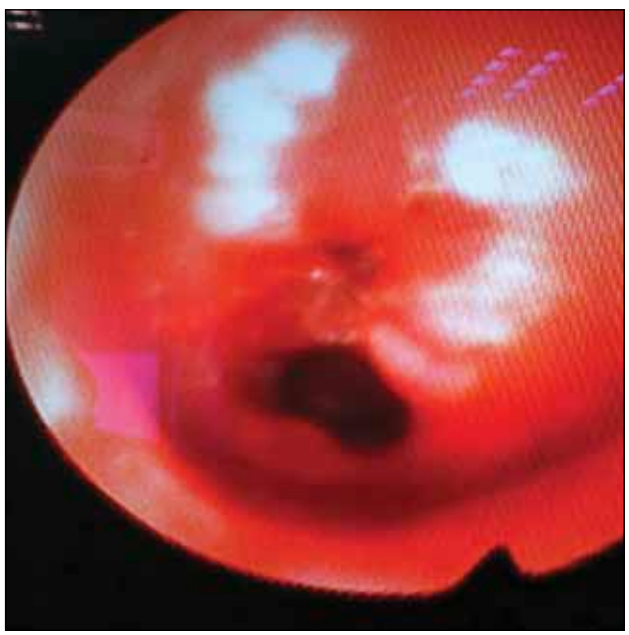

Figure 6 Laryngofibroscopic examination - subglottic tracheal stenosis with scar tissue on the anterior wall

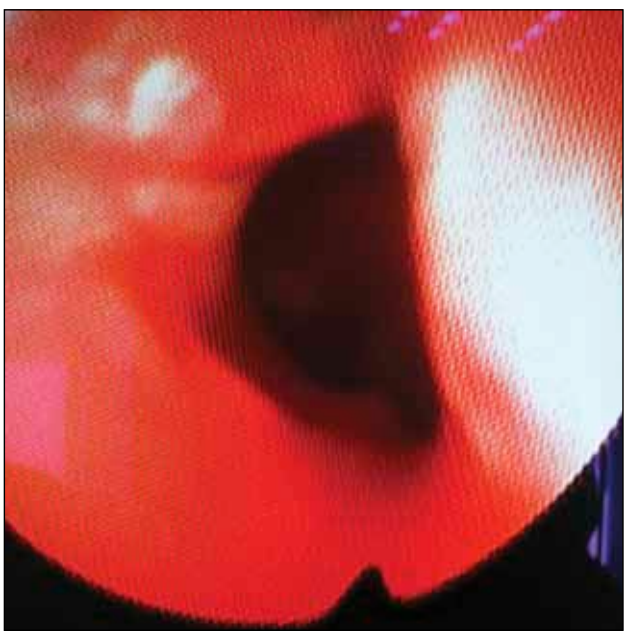

Figure 7 Laryngofibroscopic examination - efficient subglottic space after diode laser vaporization of tracheal stenosis

TRK-A gene located on chromosome 1, associated with PTC, codifies a receptor for nervous growth factor on the cell surface[11].

This type of cancer affects females, in younger age, with history of endemic goiter or thyroid cancer. The particularity of our case consisted in the male sex of our patient who was diagnosed first with giant thyroid goiter, but with no family history of this kind of pathology.

In order to predict the outcome of the patient, it is important to know his age and the extension of the tumor. In our case, the patient, a 25-year-old male, was diagnosed with well-differentiated papillary thyroid carcinoma with lung metastases (bilateral pulmonary microdules - miliary aspect).

The prognosis of papillary thyroid cancer depends on age, sex and stage. The mean survival rate after 10 years is higher than 90% and is 100% in very young patients with minimal nonmetastatic disease. Predictive factors for survival are: age older than 45 years, male sex, minority race, node metastases, extrathyroidal invasion and distant metastases[12]. If two or more risk factors are present, like in our case (male sex, young age, distant metastases), an aggressive treatment should be considered[13].

The treatment of papillary thyroid carcinoma consists, first of all, in hemithyroidectomy or total thyroidectomy, according to the local extension of the disease. It is always associated with radioiodine therapy to destroy any metastasis and residual tissue in the thyroid, long-term thyroid hormone replacement - levothyroxine, and chemotherapy with cisplatin or doxorubicin for recurrent or advancing disease[14]. Surgical treatment of thyroid cancer can lead to several complications, including hypothyroidism following surgical procedure, vocal cord paralysis due to damage of recurrent laryngeal nerve (Gerhardt syndrome), dysphagia by affecting the upper laryngeal nerve or hypoparathyroidism determined by parathyroid gland ablation[15]. These complications should be correctly treated because they can affect patient's quality of life, even if cancer prognosis is good (the survival rate is at least 95%) under adequate treatment.

The mean mortality rate is 1.5% for females and 1.4% for males, according to the literature[2].

A patient with papillary thyroid carcinoma has to be carefully revaluated 6 and 12 months after treatment. A complete physical examination, cervical CT exam, thyroid scintigraphy or PET-CT, TSH and thyroglobulin measurement, antithyroglobulin antibodies titration should be part of patient follow-up[16].

CONCLUSIONS

Papillary thyroid carcinoma is one of the most common malignant thyroid tumors. Its prognosis is related to age, sex and stage. Treatment is complex, involving surgical procedure, radioiodine therapy, thyroid hormone replacement and chemotherapy. Most of the patients with papillary thyroid carcinoma can be cured, but the surgical and follow-up strategy has to be in accordance with the prognostic factors and any other evidence of disease, in order to improve quality of life.

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