CASE REPORT

Invasive follicular thyroid carcinoma infiltrating trachea

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Abstract

Introduction. Although follicular thyroid carcinoma is a rare malignant tumor, up to 20% of the patients are threatened by potential complications resulting from infiltrating tumor growth into surrounding tissues. Case report. A 66-year-old female came to hospital with the presence of a growing thyroid nodule of the left lobe. Ultrasonic examination showed a 8 cm hypoechoic nodule in the left lobe. Thyroid scintigraphy showed a cold nodule. CT scan and tracheoscopy showed tracheal infiltration without tracheal obstruction. An extended total thyroidectomy was done, with the left jugular vein, strap muscles and trachea 2 cm long circular resection. The pathologist confirmed invasive follicular thyroid cancer. After the surgery the patient was treated with radiiodine therapy and permanent TSH suppressive therapy. The patient was followed with measurements of the thyroid hormone and serum thyroglobulin level every six months, as well as the further tests (chest x-ray, ultrasound of the neck and a whole body scintigraphy) done. After more than three years the patient had no evidence of the recurrent disease. Conclusion. Radical resection of the tracheal infiltrating thyroid cancer with circular tracheal resection and terminoterminal anastomosis followed by radiiodine therapy should be considered the treatment of choice.

Key words: thyroid neoplasms; adenocarcinoma, follicular; thyroidectomy; treatment outcome.

Introduction

Thyroid carcinoma is a rare malignant tumor. It is typically presented with slow progression and clinical course. It is for this reason that most thyroid carcinomas are curable provided adequate treatment is performed in time. Histological classification of thyroid carcinoma is into papillary, follicular, medullar, and anaplastic one. The incidence of follicular carcinoma is 5%. Over the past thirty years, the incidence of this carcinoma has grown around the world although this growth has not been followed by an increase in mortality rates. Although it belongs to a class of malignant tumors, a ten-year survival rate is at around 90%.

The risk factors for follicular carcinoma are iodine deficiency, age over 45, male sex and radiation exposure. Prognostic factors in follicular carcinoma include tumor size, the presence of distant metastasis, age, sex, vascular invasion and rare histological type. Surgical treatment is the basic form of treatment of thyroid carcinoma. Additional treatment includes TSH suppress-
sive therapy by L-thyroxine and radio ablation by I-131. Although debates on radicalism of surgical treatment have lasted to this day, total or near-total thyroidectomy is the most widely accepted treatment in most centres around the world.

Total thyroidectomy facilitates follow-up of patients with well-differentiated carcinoma and allows earlier diagnostics, as well as early detection of recurrence. After total thyroidectomy, serum thyroglobulin is an excellent marker for the detection of recurrence.

The aim of this case report was to present a 66-year old female surgically treated for follicular thyroid carcinoma infiltrating front tracheal wall, the left jugular vein and strap muscles.

Case report

A 66-year-old, female patient was sent to the Department for Endocrine Surgery, Clinical Center of Montenegro with neck tumor. Although the patient knew about the nodule in the left lobe for 14 years, over the last six months she noticed painless growth of a nodule. Previous year the patient had bad appetite, and suffered weight loss and insomnia. The patient was found to have enlarged painless solitary thyroid tumor. Inspection of the neck showed neck deformity on the left side, and palpatory 8 cm wide fixed painless tumor of the left thyroid lobe. There was no evidence of cervical lymph nodes enlargement. Laryngoscopy showed normal findings. We evaluated a nodule by fine needle aspiration biopsy. It was found hypercellular smear with solid groups and rare small follicular structures of enlarged, relatively uniform epithelial cells. A conclusion was follicular lesion.

Ultrasonography of the neck showed hypoechoic heterogeneous 8 cm large and irregular contour nodule with calcification in the central part. There was no enlargement of the cervical lymph nodes. Chest X-ray was without metastases present. There was a normal thyroid hormone and calcitonin level and a high serum thyroglobulin concentration up to 1,000 μg/mL. Thyroid scintigraphy showed a cold nodule in the left lobe. CT scan showed a tracheal infiltration without obstruction (Figure 1). Tracheoscopy showed a 1 cm wide space in the front part of the tracheal wall with malignant infiltration.

During the surgery a big tumor was found, infiltrating strap muscles on the front left neck side. The tumor also infiltrated the left jugular vein and the front part of trachea. We made an extended total thyroidectomy with circular tracheal resection and terminoterminal anastomosis (Figure 2).

During the surgery another sterile endotracheal tube was put into the trachea to obtain airway during tracheal resection and anastomosis. On the front side the tumor infiltrated the tracheal wall. We resected a 2 cm of tracheal ring with tumour and made terminoterminal tracheal anastomosis (Figure 3). Intraoperative consultation with the pathologist led to the diagnosis of invasive thyroid cancer. During neck exploration we did not find enlarged lymph nodes. We identified and preserved two right parathyroid glands on the right side and both recurrent laryngeal nerves. The entire thyroid gland was removed with left strap muscles, left jugular vein, and two rings of trachea. Both sides of the neck were drained, and the neck fixed in flexion position. There was no evidence of postoperative hypoparathyroidism, recurrent nerve paresis or respiratory insufficiency. The first three postoperative days the patient was treated in the Intensive Care Unit, and the following 8 days at the Department for Endocrine Surgery. The following day the patient went home in good condition.
The pathologist diagnosis was invasive follicular carcinoma infiltrating the trachea by examining well-fixed paraffin embedded histologic section.

Tumor cells were invading a capsule in a mushroom-shaped growth, but also the muscles and the tracheal wall (Figure 4).

![Fig. 4 – Follicular carcinoma infiltrating the trachea (HE, x 10)](image)

Vascular invasion was detected to veins beyond and in the thyroid capsule. Immunohistochemistry analysis showed thyroglobulin positivity.

One month after the surgery the wound was well, with no evidence of local recurrence. There was no evidence of hypoparathyroidism or the laryngeal nerve palsy. Two months after the surgery the patient had 3.7 GBq I-131 radio ablation. One year later, body scintigraphy did not show any activity in the neck or body, with low thyroglobulin level. Two years after the surgery the patient had 5.55 GBq I-131 radio ablation. The patient was on permanent L-thyroxin suppressive therapy with TSH level 0.05 mU/L. The patient was regularly controlled for four years and there was no evidence of local recurrent disease.

Discussion

In the preoperative diagnosis of tumor tracheal invasion, CT scan and tracheoscopy play the main role. A definitive diagnosis is established with histological tumor examination. An inherent limitation of thyroid fine needle aspiration is its inability to distinguish follicular adenoma from follicular carcinoma. Morphology of follicular adenoma cells is similar to follicular carcinoma cells. Follicular carcinoma has a marked propensity for vascular invasion and avoids lymphatics, disseminates hematogenously and metastasizes to lung, bone, brain and liver. Patients with follicular carcinoma that is invasive fare poorly, however those with encapsulated tumors confined to the thyroid enjoy a prolonged survival. Extrathyroid invasive thyroid cancers have worse prognosis. The incidence of extrathyroid spread in differentiated thyroid carcinoma is from 5% to 34%. Tumor usually invades thyroid capsule, strap muscles, jugular vein, trachea and the esophagus. Big tumors are a delicate surgical problem because of radical surgical eradication, tracheal resection and reconstruction.

The pathologist can diagnose an invasive follicular carcinoma infiltrating the trachea by examining well-fixed histological section.

Extrathyroidal extension is defined as extension of the primary tumor outside of the thyroid capsule and invasion into the surrounding structures: strap muscles, trachea, larynx, jugular vein, carotid artery, esophagus, and recurrent laryngeal nerve. Extrathyroidal extension is well-established as an important adverse prognostic factor and is used in several staging systems, including the EORTC, TNM classification, system by DeGrott, AGES, AMES, and MACIS.

About 6% of patients with thyroid cancer are with life-threatening tumor invasion of trachea. The extent of resection depends on the tumor diagnosis and the stage in differentiated thyroid cancer, extent of tumor invasion, and general health condition of the patient. Comprehensive use of diagnostic methods, especially of MRI, will give detailed information on operation. After the complete tumor resection, 5-year and 10-year survival rates of 40%–75% can be achieved. An incomplete tumor resection has a negative effect on the prognosis. Tangential tumour resection (shaving) is indicated if no transmural invasion of the trachea has occurred. Tracheal resection can be subdivided into six standard procedures: types 1 and 2 – laryngotraheal or tracheal window resection; types 3 and 4 – circular resection with primary reconstruction infraglottic or tracheal; and types 5 and 6 – laryngectomy and cervical evisceration.

The aims of enlarged surgical treatment in differentiated advanced thyroid carcinomas are to guarantee respiratory and alimentary functions as well as symptomatic benefits, and to obtain local control of the disease and recovery of the adjuvant therapeutic options, such as metabolic and conventional radiation.

In Gaissert et al. study of 82 patients, after resection and reconstruction, the mean survival time was 9.4 years and a 10-year survival rate was 40%. Incomplete surgery is related to worse prognosis more than complete surgery, also tracheal deep invasion related to worse prognosis than minimal invasion. However, operative complications associated with the procedure, especially insufficiency of the anastomosis and bleeding from large vessels are life-threatening.

At last, radical eradication of differentiated thyroid carcinoma infiltrating trachea followed by radioiodine application should be considered the treatment of choice.

Conclusion

Follicular invasive thyroid cancer with tracheal invasion is a rare malignant tumor. The pathologist can diagnose an invasive follicular carcinoma infiltrating trachea by examining a well-fixed histological section. Extrathyroid invasive thyroid cancers have worse prognosis. Invasive tumor presents a delicate surgical problem because of radical surgical eradication, tracheal resection and reconstruction. Radical resection of the tracheal infiltrating thyroid cancer with circular tracheal resection and termi-terminal anastomosis, followed by radioiodine therapy should be considered the treatment of choice.
REFERENCES


Received on March 1, 2010.
Revised on August 11, 2010.
Accepted on October 5, 2010.