Selective radio-guided neck dissection for cervical lymph node metastasis from occult thyroid cancer: Report of a case

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Summary

Background: Cervical lymph node metastases are rarely observed as a first manifestation of occult thyroid carcinoma.

Case Report: The case of a 35-year-old woman is presented. Five years before she had undergone near-total thyroidectomy because of multinodular goiter, which proved to be a benign colloid goiter at histology. Neck USG revealed findings suspicious of neoplastic/metastatic adenopathy. Fine-needle aspiration (FNA) cytology was inadequate, but thyroglobulin was detected in the needle washout, revealing metastasis from an occult thyroid cancer. The patient underwent radio-guided selective neck dissection followed by radiiodine therapy. After a 5-year follow-up, the patient is free of disease.

Conclusions: In patients with lateral cervical mass, the diagnosis of lymph node metastasis from occult thyroid carcinoma should be considered. USG-guided FNA and thyroglobulin analysis of needle washout are effective and efficient in the diagnosis and surveillance in these patients. Radio-guided surgery may represent an alternative technique with low morbidity.

key words: occult papillary thyroid carcinoma • lymph node metastasis • fine-needle aspiration cytology • thyroglobulin measurement on needle washout • radio-guided surgery

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Small primary tumors of the thyroid gland measuring less than 10 mm in diameter, virtually undetectable by careful palpation and other diagnostic procedures, have traditionally been called occult thyroid carcinoma. More recently, the term papillary thyroid microcarcinoma (PTMC) has been proposed to replace the term occult papillary carcinoma to designate carcinomas of 10 mm or less in diameter [1,2]. Nowadays it is estimated that PTMCs account for up to 30% of all papillary thyroid cancers [2].

PTMC is reputed to have an excellent prognosis, and usually has a “benign” behavior and usually remains latent, rarely affecting the patient’s life or health [2–4]. However, recurrent or persistent disease after total or near-total thyroidectomy is surprisingly common. Up to 40% of these patients have neck lymph node involvement [4–7] and in 5% of them, lymph node metastases precede clinical evidence of the primary tumor and may be the sole manifestation of the disease [4,7–9]. Moreover, although PTMC carries a low risk of mortality (0–1%), immediate metastatic forms can be associated with unfavorable prognostic factors, such as multifocal tumors, extension to adjacent tissues, extracapsular extension, and the development of distant metastases [5,6]. For these reasons, some controversy persists regarding its optimal management [2]. In selected patients with persistent thyroid cancer, the use of radio-guided surgery (RGS) may represent an alternative or complementary therapy with relatively low morbidity, individualizing tumor therapy options [10].

We report a case of a papillary thyroid carcinoma presenting with a solitary lymph node metastasis which was successfully treated with selective RGS. This case report reinforces the growing evidence of the effectiveness of this minimally invasive surgical procedure in the management of differentiated thyroid cancer.

**CASE REPORT**

The case of a 35-year-old woman referred to our endocrinology unit is presented here. She had undergone near-total thyroidectomy at the age of 30 because of a large multinodular goiter causing compression and dislocation of the neck structures (particularly the trachea). The surgical procedure was technically difficult due to the patient’s characteristics (a short, fat neck) and the conspicuous enlargement of the thyroid gland, which extended substernally in the mediastinum. Consequently, a right laryngeal nerve palsy occurred. Pathological examination of the surgical specimen was consistent with a benign colloid goiter and replacement therapy with L-thyroxine (L-T4) was started (125 μg/day). In the following five years, the patient showed poor compliance with medical treatment and serum thyrotropin (TSH) levels often exceeded the upper limit of the normal range on L-T4 therapy, while serum free thyroxine (FT4) and free triiodothyronine (FT3) were always in the normal range.

When the patient was admitted to our hospital, no remaining thyroid tissue was detected by ultrasonography (USG) of the neck, thus confirming the extent of the thyroid resection (near-total thyroidectomy). However, USG revealed findings suspicious of neoplastic/metastatic disease in a lymph node of the left lateral-cervical compartment (14 mm in diameter, Figure 1A). Biochemical studies showed normal serum levels of TSH (2.0 U/l, norm: 0.4–4.0) and FT4 (14.7 pmol/l, norm: 10.3–24.6) while taking thyroid hormone therapy. Serum thyroglobulin (Tg) was 3.0 ng/ml (norm: <40 ng/ml). Antithyroglobulin antibodies (TgAb) were absent.

USG-guided fine-needle aspiration (FNA) to obtain material for cytology and Tg analysis was performed. Cytology was inadequate, but Tg was detected in the needle washout, and the FNA-Tg level was higher than the serum Tg of the patient (352 ng/ml, lower limit of detection: 0.9 ng/ml). 99mTc-MIBI scintigraphy of the neck and thoracic regions (anterior views) performed ten minutes after intravenous administration of 185 MBq (5 mCi) of 99mTc-MIBI (B). MIBI scan showed abnormal and very intense uptake in the left cervical region corresponding to the lymph node detected by USG, thus confirming the presence of a metastatic focus.

Two hours after 99mTc-MIBI administration (185 MBq or 5 mCi), the patient underwent radio-guided surgery (appli-
The patient was followed-up at our unit for five years, during which thyroid function tests (FT3, FT4, and TSH) were regularly performed to check the adequacy of the L-T4 suppressive therapy. The follow-up was based on physical examination, neck USG, and both basal and recombinant human TSH (rhTSH)-stimulated serum Tg measurement as well as Ab-Tg measurement. At the last follow-up, five years following RGS and radioiodine therapy, there was no evidence of disease.

**DISCUSSION**

Microcarcinomas or occult papillary carcinomas of less than 10 mm in diameter which are virtually undetectable by conventional diagnostic methods and occur as lateral cervical tumors as the first and sole manifestation in almost 5% of cases [7–9]. In many cases, the primary thyroid tumor may also be undetectable intra-operatively because such a microscopic lesion might be missed on routine microscopic section or step sections of the entire gland during pathological examination [12]. Our case report supports prior studies on large series [7–9,13–17] that suggest that the presence of malignant thyroid tissue within a cervical lymph node may be predictive of an undetected primary thyroid malignancy and confirm that any lateral mass requires a careful evaluation and tissue diagnosis.

Echographic examination is the most useful diagnostic tool for the study of a mass in the neck and also allows performance of FNA cytology [18,19]. With regard to the usefulness of FNA in diagnosing lymph node metastases, Baskin et al. [20] reported their results on 74 PTC patients screened with USG and Tg measurement during their postoperative follow-up. USG revealed findings suspicious of recurrent disease in the lymph nodes of the neck in 21 patients. Ultrasound-guided FNA to obtain material for cytology and Tg analysis was done on these 21 patients, 7 of whom tested positive for Tg in their needle washout. Only 3 of the 7 had detectable Tg in their serum and only 5 of the 7 had positive cytology. Similar results were presented by The Jong and coworkers [21] in a consecutive series of 243 patients with PTC and lateral cervical masses that proved to be metastatic lymph nodes. The metastatic disease was demonstrated by excisional biopsy in 40 patients and by FNA in only 12. Therefore negative results of FNA should not be regarded as evidence of benign disease. The presence of Tg in the needle washout proved to be more sensitive than cytology in diagnosing cancer in the lymph nodes and is not affected by positive anti-Tg antibodies in the serum [22].

Due to of the generally good prognosis of PTMC, decisions about the optimal treatment of these tumors (discovered incidentally or non-incidentally) remains controversial. While the need for a near-total thyroidectomy is quite accepted [2], surgeons continue to debate on the extent of lymph node dissection [8,23,24].

The presence of lymph node metastases, according to most investigators, does not worsen the prognosis or increase mortality [4,25–28]. In a study by Appetecchia et al. [4] which included 120 patients with PTMC, despite the presence of neck metastases in 22% of the patients and of local invasion beyond the thyroid capsule in 20 (17%), only 1.7% of the patients developed local recurrence. More recently,
Leboulleux and colleagues [25] demonstrated an excellent 10-year survival rate of PTC patients with lymph nodes metastases and/or minimal extrathyroid extension, indicating that the presence of lymph node metastases had no prognostic influence. Moreover, Leon and coworkers [26] provided evidence that the incidental finding of thyroid tissue in the neck lymph nodes did not necessarily indicate the need for aggressive therapy.

According with this evidence, radio-guided surgery may represent an additive surgical technique with low morbidity in selected patients with persistent thyroid cancer. Minimally invasive radio-guided surgery is widely used in the setting of sentinel node biopsy for melanoma and breast and other malignancies as well as in minimally invasive parathyroid surgery [27]. Sparse literature exists describing its use in thyroid cancer [10,28–32]. In our patient we preferred a minimally invasive surgical approach in order to reduce the possibility of complications (a right laryngeal nerve palsy had occurred during the first surgical procedure). Radio-guided surgery allows detecting lymph node metastases, even those not seen by conventional imaging, and verifying the completeness of resection, thus leading to a complete clearance of persistent disease with limited neck surgery. This minimally invasive surgical technique has no relevant side effects and/or adverse consequences. Moreover, because PTMC carries an extremely low mortality [2], this treatment may not improve the long-term outcome of the disease.

**Conclusions**

We conclude that in a patient with a solitary lateral cervical mass, the diagnosis of lymph node metastasis from occult papillary thyroid carcinoma should be considered. Ultrasound with FNA-Tg analysis of the needle washout of suspicious lymph nodes proved to be effective and efficient in diagnosing cancer in the lymph nodes. Moreover, our case illustrates the potential benefits of radio-guided surgery in selected low-risk patients with thyroid cancer, individualizing tumor therapy options.

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