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CASE REPORT

Is There Primary Medullary Thyroid Carcinoma in the Cervical Lymph Node? A Case Report

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Abstract

Background: Ectopic thyroid carcinoma is relatively rare and has been reported to occur in some sites, such as the thyroglossal duct and tongue. The presence of ectopic medullary thyroid carcinoma in the cervical lymph nodes has not been reported, as far as the literatures we collected.

Patient findings: A 55-year-old male patient came to the surgery clinic for evaluation because he found a growing mass in the left neck. Fine needle aspiration (FNA) was performed, and the cytologist diagnosed metastatic medullary thyroid carcinoma (MTC). Based on PET-CT, ultrasound and laboratory investigation, clinicians performed total thyroidectomy and cervical lymph nodes dissection for the patient. The diagnosis was: 1.Lymph nodes malignant tumor (positive 3/8), first considered MTC; 2.Nodular goiter.

Summary: In this patient, we embedded and sliced the entire thyroid for examination. However, no abnormal nodules were found in the thyroid tissue. The conclusion of ectopic MTC in cervical lymph nodes was ultimately made. At present, the patient regularly undergoes thyroid ultrasonography, no abnormal nodules are found, with normal serum calcitonin levels.

Conclusions: Although ectopic MTC is rare, the possibility of its presence in the neck must be considered. The operation of FNA and the correct diagnosis by cytologist can save a lot of time for subsequent treatment.

Keywords: Ectopic MTC, Cytologic Diagnosis, Serum Calcitonin

Introduction

Total ectopia of thyroid is an unusual phenomenon, most of which is in teratoma, and malignant change in an ectopic thyroid tissue is even rarer [1]. The majority of carcinomas observed in the lingual thyroid are reported to be follicular [2, 3], with very few case reports of papillary carcinoma [4]. The ectopic thyroid tissue in lymph nodes (LN) of neck is more rare in clinical entity. Primary medullary thyroid carcinoma (MTC) is about 10% of thyroid malignant tumors arised from C-cell in thyroid gland. Up to now, there is no report of MTC which is only found in cervical LN but not in primary thyroid gland. Therefore, we provide a case that only shows ectopic MTC of LNs in the neck.

Case Report

A 55-year-old male patient came to the surgery clinic for evaluation because he found that the mass in the left neck was enlarged for about one month. He did not have the following clinical symptoms, such as fever, hoarseness, dyspnea, dysphagia, etc. The patient denied the history of surgery and external injury. A painless toughness mass could be reached in the left side of neck of thyroid area level, and ultrasound indicated a hypoechoic round mass with low echo in the vicinity of the thyroid tissue. It was suggested that the patient should be examined by fine-needle aspiration biopsy (FNAB). Furthermore, the patient's serum calcitonin level was 291pg/ml (normal range was 0~11.5pg/ml).

The FNA smear of the cervical LN exhibited a great number of dominated same-size cylindrical or spindle cells in a dispersed pattern with round-shape nucleus and a few of giant nucleus cells were isolated in these same-size cells, of which nucleus diameter was 3-3.5 times larger than that of the dominant tumor cells. Under the microscope, some amorphous substances stained pink and purple could be seen in part of the background, which was suspected to be amyloid. Most of the nuclear staining was salt-and-pepper-like. Based on the above description, the patient was diagnosed as metastatic MTC by cytopathology.

A PET-CT was carried out and it showed only enlarged cervical LNs with high level of glucose metabolism could be seen on the level of thyroid tissue. It meant there was metastatic tumor in the LNs.

Subsequently, clinicians performed total thyroidectomy and cervical lymph node dissection on the patient according to the pathological diagnosis.

Macroscopic examination showed multiple small nodules in the lobes of the thyroid gland, the nodules were clear, the cut surface was gelatinous, gray-red, and soft texture. Six lymph nodes were obtained from neck level VI lymph nodes (two of which were gray-white), and two of the lymph nodes were obtained from the left level II to III lymph nodes (one of which was gray-white). There was no obvious abnormality of thyroid nodules under microscope. The deeply stained metastatic cells were observed in the grayish-white lymph nodes, and these cells grew in two ways (diffuse type and follicular type). The substance in the follicular structure was the pink-purple amyloid protein as FNA smears mentioned above. The characteristics of abnormal cells in the histological sections were consistent with those of MTC cells, especially the nuclei. Rare megakaryocytes could be seen occasionally in the sections, and there are no normal thyroid follicles and tissues in the lymph nodes. Immunohistochemical staining of the abnormal cells showed that calcitonin, TTF-1, CD56, Syn were positive.

Because no abnormal nodules were found in original thyroid tissue slices at the first examination, we embedded and sliced all of the rest thyroid tissue for second examination. However, no abnormal nodules were found in the rest thyroid tissue either.
Based on the histological manifestation and positive immunostaining marks, the diagnosis was: 1, Lymph nodes malignant tumor (positive 3/8), first considered medullary thyroid carcinoma; 2, Nodular goiter.

At present, the patient regularly undergoes thyroid ultrasonography, no abnormal nodules are found, with normal serum calcitonin levels.

Discussion

Medullary thyroid carcinoma (MTC) accounts for approximately 5% of thyroid malignancies. MTC is a well-differentiated neuroendocrine carcinoma that arises from thyroid C-cells. It occurs as a sporadic cancer in approximately 80% of cases and is part of autosomal dominant genetic familial disorders in the remaining ones [5].

The diagnosis of MTC is usually made by fine needle aspiration (FNA) cytology and serum calcitonin measurement [6]. For experienced physicians, FNA can provide significant assistance in preoperative diagnosis. Microscopically, the cells may be characterized by nuclear dislocation, "neuroendocrine" chromatin, inconspicuous nucleoli, binuclear and multinucleate cells, the cell boundaries are unclear, the background is clean, and amyloid is sometimes present. In our case, the main cytological characteristics of abnormal cells in cervical lymph nodes matched the cellular features of MTC in FNA smears. Therefore, the cytological diagnosis was metastatic MTC.

MTC mainly synthesizes and secretes calcitonin (CT), carcino-embryonic antigen (CEA), and vasoactive substances such as histamine, active peptides, and corticotropin. When the serumal CT level is higher than 100 pg/ml, it is considered as MTC[7]. One of the reasons for our diagnosis of metastatic medullary thyroid carcinoma is that the patient's serum calcitonin level is 291pg/ml. Williams PL, et al, considered that parafollicular C-cells reach the thyroid by ultimobranchial bodies, which are the product of the fourth and fifth branchial pouches and form 1%-30% of the thyroid weight. Failure of descent of either the medial anlage of the thyroid, or the ultimobranchial bodies, and the incomplete obliteration of its vertical tract, lead to ectopic thyroid development, including C-cells [8]. Ectopic thyroid cancer is rare, with a reported incidence of 1 in 300,000[9]. It can be found in many sites, the most common of which is the thyroglossal duct. Ectopic thyroid cancer in the lymph nodes of the neck is rare. And ectopic medullary thyroid cancer is even rarer.

It is also important to emphasize that the diagnosis of ectopic MTC is not established without examination of the normal thyroid gland. We can confirm that there is no evidence of suspected malignancy in the normal thyroid by ultrasonography, MRI, CT and thyroid radionuclide scanning, and take samples of the whole thyroid and confirm that no malignancy is found in the continuous section, after which the diagnosis of ectopic MTC can be confirmed[10]. In our case, abnormal mass was not observed in original thyroid tissue in pre-operation (including PET-CT examination), intra-operation and post-operation. All thyroid tissue were embedded and sectioned, and only encapsulated lesions were found under microscope, and there were no abnormal nodules or cells. Tumor tissue (or cells) was found only in lymph nodes. Therefore, our paramount consideration is to suspect the ectopic MTC in LNs.

MTC is a moderately malignant cancer with a relatively poor prognosis. But most cases are asymptomatic and are only noticed when the lymph nodes in the neck grow progressively larger and cause discomfort, as in this case. Most guidelines consider total thyroidectomy plus cervical lymph node dissection as the preferred treatment. Since the ectopic MTC from the cervical lymph nodes has not been reported in the literature, in our medical institution, the surgeons of the thyroid and breast surgery gave the treatment plan used for the general cases diagnosed thyroid malignant tumor with LNs metastasis in order to exclude the primary focus of MTC from the original thyroid tissue. And our case is followed by this way.

The gene clearly associated with the development of MTC is chromosome 10, involving mutations in the RET oncogene. According to the 2015 American thyroid association (ATA) MTC guidelines, RET gene can be detected for both genotypic MTC and sporadic MTC[11]. In addition, Boichard et al. found that RAS mutations and RET mutations were mutually exclusive, and RAS gene testing was feasible in sporadic MTC patients with negative RET mutations [12].

Serum CT play an important role in postoperative monitoring of MTC. Failure to detect calcitonin at 2 months after thyroidectomy was a good predictor of complete response, with a less than 4% risk of recurrence during follow-up. When the serum CT level is above 150Pg/mL, more detailed imaging studies such as neck and chest CT, liver MRI, bone scan, spinal and pelvic MRI, and even PET-CT tests are required[13,14].

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Author Disclosure Statement

No competing financial interests exist.

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