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Case Report

Intra-Abdominal Paraganglioma and Primary Thyroid Lymphoma in a Single Patient: The First Case Report

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Keywords

Nonfunctional paraganglioma · Primary thyroid lymphoma · Hashimoto's thyroiditis · Case report

Abstract

Rare diseases such as primary thyroid lymphoma (PTL) and paragangliomas exist. Although only 0.5% of patients experience a transformation from thyroiditis to PTL, patients with Hashimoto's thyroiditis have a higher risk of developing PTL than the general population. Primary non-Hodgkin lymphoma of the thyroid is rare. Paragangliomas are neuroendocrine tumors that originate from chromaffin cells situated along the sympathetic and parasympathetic chains. This paper reports the first case of primary diffuse large B-cell lymphoma with nonfunctional paraganglioma. A 29-year-old female presented with an enlarged neck and recurrent compressive symptoms. Ultrasonography results showed a nodule in the right lobe of the thyroid gland. Emergency thyroidectomy was performed after obtaining inconclusive fine-needle aspiration results. Immunohistopathology of the biopsy specimen confirmed the presence of a large diffuse B-cell lymphoma. Computed tomography revealed a nonfunctional mass in the adrenal gland. The team then proceeded with the appropriate treatment.

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Introduction

Thyroid cancer is the most common endocrine malignancy and accounting for approximately 1% of all malignancies. Primary thyroid lymphoma (PTL), including the endocrine gland alone, accounts for only 5% of all thyroid malignancies and approximately 3% of all non-Hodgkin lymphomas. The annual prevalence of PTL is one or two cases per million [1–3]. Diffuse large B-cell lymphoma (DLBCL) accounts for up to 70% of all PTLs [4]. DLBCLs are generally positive for MS4A1 (CD20), with 75% also positive for the BCL6 oncogene and up to 50% positive for the BCL2 oncogene [5]. The transformation from thyroiditis to PTL arises in about 0.5% of patients with Hashimoto's thyroiditis at a higher risk of developing PTL than the general population [6, 7].

Paragangliomas are rare neuroendocrine tumors originating from chromaffin cells along the sympathetic and parasympathetic chains [8]. Parasympathetic paragangliomas are typically inactive and located mainly in the neck and skull base, whereas sympathetic paragangliomas are mainly located in the retroperitoneum and typically produce and secrete norepinephrine [9]. Up to 15% of retroperitoneal paragangliomas are nonfunctional, and up to 10% are functional without clinical signs, although they seem functional histologically and immunologically [10].

According to what has been reported in the literature, no published cases combine intra-abdominal paraganglioma and PTL in the same patient; therefore, our case could detect a possible association between both tumors. Here, we report a unique case of a 29-year-old woman with DLBCL arising from Hashimoto's thyroiditis and nonfunctional paraganglioma. However, future clinical studies are required to investigate the real link between the two tumors and determine whether there are similarities in their biological mechanisms. The CARE Checklist has been completed by the authors for this case report and is attached as supplementary material.

Case Presentation

A 29-year-old housewife, G2P2, presented with dysphagia due to neck pain over 2 months ago. She reported no anorexia, weight loss, fever, or sweating. She had no significant history of health problems. In addition, social, environmental, family, and employment histories were unremarkable. Her family history was negative for thyroid cancer, smoking, and alcohol drinking, and she did not take any medication to relieve her symptoms before diagnosing her condition. Physical examination revealed a goiter, no cervical lymph node enlargement, stiffness, skin rash, etc. Neurological examination did not reveal any abnormalities. She had no hypertension, heart palpitations, or obesity. The vital signs and blood pressure at admission were within normal rates. The laboratory results were within normal rates, including CBC, liver and renal functions, urinalysis, serology, thyroid studies, microbiology, etc. Ultrasonography of the thyroid gland revealed a nodule in the right lobe measuring 8 cm in diameter. In thyroid function tests, TSH levels were markedly elevated. The fine-needle aspiration came back as inconclusive.

As the mass was symptomatic, surgical excision was performed. The patient underwent a thyroidectomy. During the surgery, we noted that the gland was solid and adhered to the trachea. A biopsy of the removed thyroid tissue showed primary diffuse large cell lymphoma arising in the background of chronic lymphocytic thyroiditis with complete effacement of the thyroid tissue on the right side and extension to the parathyroid soft tissue. The combined histological and immunohistochemical analyses led to the diagnosis of large diffuse B-cell lymphoma with a high proliferation index (Ki-67:60%) and CD20-positive, CD3-negative, and

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BCL2-negative cells (Fig. 1). We performed other imaging tests to investigate the presence of metastasis. Chest computed tomography (CT) with contrast was unremarkable. However, abdominal CT with contrast revealed a circumscribed round mass, lobulated edges, and heterogeneous enhancement within the mass in the left adrenal gland (10 × 8 cm) (Fig. 2).

To determine the type of mass and whether this mass was functional or not, we performed further laboratory tests for adrenal gland functions. Biochemical tests included the measurement of the concentration of normetanephrine and metanephrine in a 24-h urine collection sample within normal levels. Low-dose overnight dexamethasone suppression test was 0.9 μg/dL. Electrolytes, liver, and kidney tests were all within normal levels.

Based on these results, the patient was referred to our surgical department for surgical removal of the mass. The patient underwent surgical resection under general anesthesia, and a left adrenalectomy was performed. Histological examination confirmed paragangliomas as the final diagnosis, which showed that they did not contain any adrenal tissues. Instead, an excisional biopsy showed a lobulated mass composed of well-defined nests of cuboidal to polygonal cells (Zellballen) surrounded by sustentacular spindle cells, and separated by highly vascularized fibrous septae, with many dilated blood vessels; the individual cells are monomorphic, have a moderately abundant granular basophilic cytoplasm, and focal nuclear pleomorphism (Fig. 3, 4).

After resection, there were no abnormal findings when conducting X-rays and CT of the chest and abdomen. In addition, we did not detect any lymph node enlargements except for an adrenal mass. The CT scan was repeated after 4 rounds of chemotherapy, and the result was normal.

Immunohistochemical stain results were positive for CD56 in epithelioid cells, chromogranin A, and synaptophysin. The histological evaluation reported S-100 positive in sustentacular cells. The patient was referred to the Oncology Department for receiving treatment. The patient received two courses of chemotherapy treatment, including intravenous 375 mg/m^2 weekly for four doses, cyclophosphamide 1,000 mg, intravenous doxorubicin 80 mg, intravenous vincristine 2 mg, and oral prednisone 100 mg for 5 days. We noted gradual improvement with no complications for 6 months, and she is still under follow-up.

Discussion

Catecholamines and their derivatives are frequently produced, stored, and secreted by abdominal PGL, leading to the typical hypertensive, palpitating, dizzying, anxious, blushing, headache, and diaphoretic symptoms [11]. Localized benign paraganglioma is often treated with surgery to remove the tumor entirely. The whole adrenal gland must be removed if the tumor is in the adrenal gland [12]. However, the PTL tumor is treated with chemotherapy, radiation therapy, or a combination of the two because it exhibits a wide range of clinical symptoms, such as trouble swallowing, shortness of breath, and/or a hoarse voice [13].

Herein, we report a case of a 29-year-old female patient with an enlarged neck and with recurrent compressive symptoms who had an emergency thyroidectomy after fine-needle aspiration. Immunohistopathology of post-excision thyroid biopsy confirmed the presence of PTL. CT also showed a mass at the expense of the adrenal. They were surgically removed by immunocytochemistry, and the presence of nonfunctional paraganglioma was confirmed. Furthermore, we observed an increase in TSH levels in this patient, which is atypical compared to the reported cases of DLBCL in the literature.

What distinguishes our rare case in medical literature is a combined PTL, which is considered very rare, in addition to intra-abdominal paraganglioma in the same patient. It requires emergency surgical treatment to avoid compressive symptoms and tumor metastases.

Case Rep Oncol 2023;16:747–752
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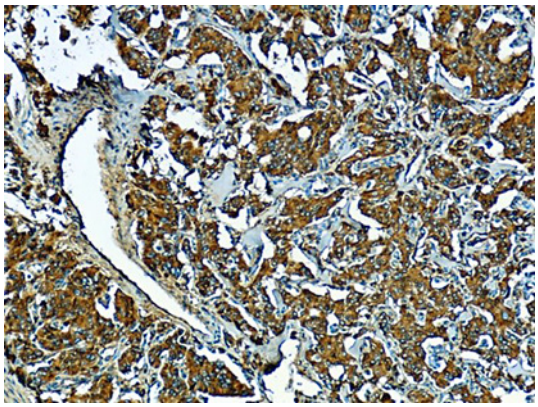

Fig. 1. Histological and immunohistochemical confirmed the diagnosis of diffuse large B-lymphoma with a high proliferation index (Ki-67: 60%) and CD20-positive, CD3-negative, BCL2-negative.

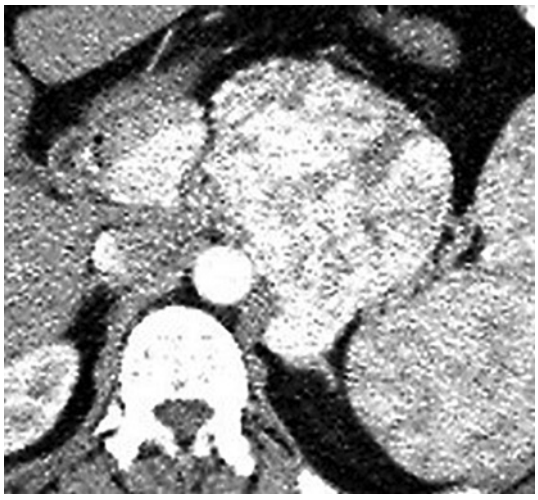

Fig. 2. Abdominal computed tomography with contrast revealed a circumscribed round mass, lobulated edges, and heterogeneous enhancement within the mass in the left adrenal gland (10 × 8 cm).

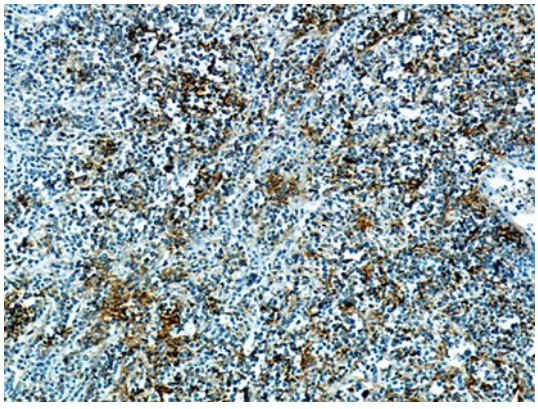

Fig. 3. Immunohistochemical stain results were positive for CD56 in epithelioid cells, chromogranin, synaptophysin.

An unknown association between the discovered tumors in our case should be defined and studied, as there was a published case in 2019 for a Caucasian female with a significant history of subtotal parathyroidectomy, in which enlarging right thyroid mass was noted. The doctors resected the mass immediately to avoid further compression symptoms, and the histological studies confirmed the diagnosis of paraganglioma as the first case report in the thyroid gland. Furthermore, it is still widely recognized that an uncommon group of head and neck paragangliomas arise from the thyroid [14].

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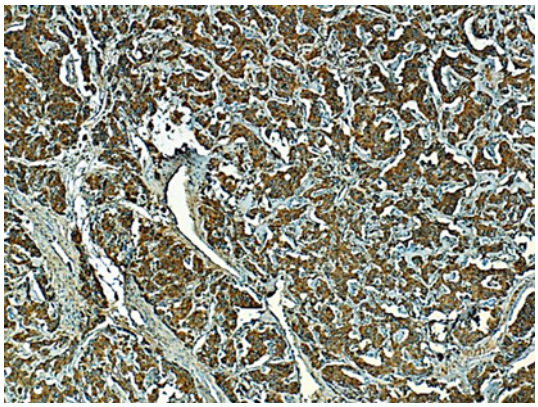

Fig. 4. CD56+ Immunohistochemical stain results: epithelioid cells, Chromogranin, and Synaptophysin.

Another published rare case described the condition of a 45-year-old Caucasian man with a clear history of health issues, such as smoking, alcohol consumption, and previous thyroid diseases. The patient presented with a neck mass and bilateral lymph node enlargement. Subsequently, the patient underwent thyroidectomy after conductance radiography, CT, and magnetic resonance imaging of the neck. Histological studies of the resected mass confirmed the diagnosis of follicular lymphoma and paraganglioma within the thyroid gland [15]. This case has significant implications for the initial assessment and evaluation of these patients. First, it validates the necessity of primary metastasis examination at the identification stage and establishes a strategy for ongoing surveillance for relapse. The most appropriate course for long-term monitoring would be to regularly conduct neck ultrasound, longitudinal scans, and urine tests to detect elevated amounts of catecholamines and metanephrines. Each noticed tumor, in our case, is a life-threatening condition in its advanced phases, so precise management is needed when dealing with such instances.

Conclusion

We present a rare case of combined PTL and paraganglioma in the same patient. PTL should be considered when presenting with localized symptoms, even if there is no relevant medical or family history. Confirmation relies on histopathology and immunohistochemistry, and chemotherapy improves the patient's condition.

Acknowledgments

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Statement of Ethics

The article describes a case report. Ethical approval was obtained from the Ethics Committee at Aleppo University Hospital (Ref: 109AU/AUH; Dated; April 12, 2022). Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

M.D.Z., S.S., R.S., H.Z., R.S., H.A.H., V.R., and A.J.N. have contributed to writing and reviewing the manuscript. All authors have read and approved the manuscript.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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