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Case Report

Primary Diffuse B-Cell Thyroid Lymphoma: Case Report and Literature Review

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Abstract
Background: Primary thyroid lymphoma (PTL) is a rare disease, accounting for 5% of all thyroid malignancies. Diffuse B-cell lymphoma (DBCL) is the most common type of PTL. The diagnosis of PTL depends on biopsy results, and its management depends on the histological type. ***Case Presentation:*** A 66-year-old female complained of a huge neck mass on the right side that had started growing 3 months previously and was associated with compressive and B symptoms. She had undergone left hemithyroidectomy 20 years previously. On examination, a huge neck mass measuring 10 × 6 cm was detected on the right side that had shifted the trachea to the contralateral side. CT scanning revealed a huge soft tissue mass in the neck with compressive signs. Fine-needle aspiration (FNA) showed variably sized lymphocytes and large epithelial cells with occasional atypical cells. Tissue biopsy revealed DBCL, which is suggestive of PTL. ***Discussion:*** PTL affects only the thyroid gland and the regional lymph nodes. Most PTL originate from B cells, especially DBCL, which accounts for 50–80% of all PTL. FNA may have limited capability to differentiate between anaplastic carcinoma of the thyroid and thyroid lymphoma. If FNA fails to determine PTL tissue, it should be determined using biopsy. A multidisciplinary approach is the best management technique for PTL. Radiotherapy, surgery, or both can be used for local control, while chemotherapy can be used for disseminated or hidden disease.

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Conclusion: Tissue biopsy is needed to exclude other differential diagnoses, whereas a multidisciplinary approach is needed to manage PTL.

Introduction

Primary thyroid lymphoma (PTL) accounts for only 5% of all thyroid malignancies [1]. It generally originates from B cells and affects only the thyroid gland and regional lymph nodes. Diffuse B-cell lymphoma (DBCL) accounts for 50–80% of all PTL [2] and, thus, is considered the most common type of PTL. PTL is diagnosed through biopsy, and its management is decided on the basis of its histological type. This work has been reported in accordance with the SCARE criteria [3].

Clinical Information

Here, the case of a 66-year-old female with known hypertension and on medication is presented. She had undergone left hemithyroidectomy 20 years previously and was on an oral dosage of levothyroxine (125 μg once daily). She was admitted to the clinic with complaints of a huge neck mass on the right side that had started developing 3 months previously. It had initially been small but then progressed in size; it was associated with dysphagia to solid food and mild dyspnea. The patient also complained of productive cough, anorexia, weight loss, and night sweat.

The patient was vitally stable and febrile. There was a huge nontender neck mass measuring 10 × 6 cm on the right side. The mass had shifted the trachea to the contralateral side.

Diagnostic Assessment

The thyroid function test results were as follows: TSH: 0.15 mIU/L; T_3: 4.38 pmol/L; and T_4: 20.4 pmol/L.

Neck X-Ray

As shown in Figure 1, a neck X-ray revealed a large prevertebral soft tissue shadow reaching up to 4.8 cm in its maximum anteroposterior diameter, causing significant pushing of the trachea anterior to the left side.

Chest X-Ray

A chest X-ray showed the loss of normal cervical lordosis with spondylodegenerative changes in the form of decreased C5-C6 and C6-C7 intervertebral disc spaces, associated with marginal osteophytosis. Both lung fields appeared to be clear. No definite acute lung infiltration was noticed. The cardiothoracic ratio was observed to be within normal limits, and a minimal bilateral pleural reaction was found.

CT Scanning of the Neck and Chest with Contrast

As shown in Figure 2a and b, CT scans revealed a sizable space-occupying mass lesion most likely originating from the right thyroid gland and causing disfigurement and bulging of the right side of the neck. The lesion measured 12.0 × 8.5 × 10.0 cm in the maximal transverse × anteroposterior × craniocaudal dimensions, respectively. The mass was mildly enhancing, with scattered areas of necrosis. Superiorly, the mass reached the level of the inferior border

of C2, while, inferiorly, it stopped at the suprasternal notch with no retrosternal extension. Posteriorly, it reached as far as the prevertebral space, and was seen abutting the anterior surface of the dated vertebral bodies. It markedly displaced the trachea, esophagus, and left carotid sheath to the contralateral (left) side. The mass was inseparable from the posterior aspect of the trachea in some parts and from the right thyroid lamina. The mass totally encased the right carotid artery (a few millimeters distal to the origin till beyond the bifurcation). The carotid artery was adequately enhancing; however, it was of a smaller diameter than the contralateral carotid. The mass was also seen to markedly displace the right jugular vein laterally, where it showed extreme narrowing/compression in some parts.

No definite lesional calcifications could be noted. A few enlarged pathological lymph nodes with a vanished hilum were noted; some of them were necrotic, and the largest was observed at the inferior boundary of the lesion, measuring about 3.5 × 2.5 cm. They were homogeneously enhancing the left carotid sheath vasculature with no sign of invasion. There was an unremarkable enhanced CT appearance of both the parotid and the left submandibular salivary glands, while the posterior border of the right submandibular gland was closely related to the above-described mass lesion. The cervical spondylodegenerative changes with markedly attenuated C5-C6 and C6-C7 intervertebral disc spaces were associated with endplate sclerosis. Multiple subcentimeter mediastinal lymph nodes were also observed.

Flexible Endoscopy

Flexible endoscopy of the neck showed right vocal cord paralysis, fullness of the right piriform fossa, and a posterior circumferential mass over the posterior hypoglossal wall at the level of the laryngeal wall.

Fine-Needle Aspiration

Fine-needle aspiration (FNA) done outside the hospital showed variably sized lymphocytes and large epithelial cells with occasional atypical cells.

Follow-Up and Outcome

The patient was transferred to another hospital for further investigation and management. She was admitted on January 25, 2018, for securing the airway, since she had developed dyspnea. Under local anesthesia, an incision was made at the site of the previous left hemithyroidectomy scar. The trachea was then shifted to the left under the sternocleidomastoid muscle. The trachea was then localized and confirmed by needle aspiration. A horizontal incision was made in between the 1st and 2nd tracheal rings, and a size 6 tracheostomy tube was inserted. After securing the airway, the patient was sedated and a neck mass biopsy sample taken from the nearby tissue. The tracheostomy tube was secured in place with 1-0 silk suture and tied. A nasogastric tube was inserted by the use of a McINTOSH Laryngoscope and Magill forceps, and its correct placement was ensured by auscultation of the stomach.

The patient was then transferred to the ICU. On February 20, 2018, the tracheostomy tube was removed, and the patient was discharged the next day without any complications. Histopathology of the biopsy revealed diffuse large B-cell lymphoma of the germinal center type. Immunohistochemical stains were performed, and the results showed neoplastic cells diffusely immunoreactive to CD20, CD45 (LCA), CD10, Bcl-6, and CD3 that were reactive to T cells. The Ki-67 index was as high as 70–80%. The patient was put on R-CHOP chemotherapy (rituximab-cyclophosphamide-doxorubicin-vincristine-prednisone); she received 2 cycles on

February 28, 2018, and the swelling regressed in size based on clinical and CT scans of the neck. The patient was admitted on March 5, 2018, for radiotherapy, and re-tracheostomy was performed on March 6, 2018. Before she was able to receive the radiotherapy, the patient had developed a septic shock and was admitted to the ICU, where she died on March 12, 2018.

Discussion

Thyroid lymphoma can be classified into PTL and secondary thyroid lymphoma (STL). PTL occurs rarely; it accounts for around 5% of all malignant thyroid tumors and <3% of all extranodal non-Hodgkin's lymphomas [1]. It affects the thyroid gland and the regional lymph nodes, while STL originates from a nonthyroid tumor that metastases to the thyroid gland. The mortality rate with STL is higher than with PTL [4].

Usually, the thyroid gland does not contain lymphoid tissue, unless there is a pathological condition. Autoimmune thyroiditis is the most common risk factor that leads to thyroid lymphoma. Patients with autoimmune thyroiditis have a 40–80 times increased risk of having PTL in comparison with other populations, and it takes 20–30 years to progress to PTL [5, 6].

Most PTL cases originate from B cells. It can be DBCL, which accounts for around 50–80% of all PTL, or mucosa-associated lymphoid tissue lymphoma, which accounts for 20–30% of PTL cases. There are other subtypes that can cause PTL, such as follicular lymphoma (12%), Hodgkin's disease (7%), small lymphocytic lymphoma (4%), and Burkitt's lymphoma (4%) [2]. Few cases have been reported in the literature that show PTL originating from T cells [7].

PTL occurs 4 times more often in women than in men. It usually occurs in the 7th-decade age group, with the median age being 67 years, while STL is common in the middle-aged group with an average age of 40 years. Usually, patients with PTL have a history of painless thyroid swelling within 1–3 months that is associated with dyspnea, stridor, dysphagia, hoarseness, cough, and superior vena cava obstruction. It can be associated with B symptoms such as fever, night sweat, and weight loss in 10–20% of patients.

Diffuse thyroid swelling is the usual sign seen during physical examination [8]. Radiological imaging such as ultrasound and CT usually shows a diffuse enlarged swelling in the thyroid gland or thyroid nodules. The findings on radiological imaging can be solitary or in multiple thyroid nodules. FNA has an important role in diagnosing thyroid nodules, but it has a limited effect on PTL. This is because, in some cases, it is difficult to differentiate between thyroid lymphoma, lymphocytic thyroiditis, and anaplastic carcinoma of the thyroid – particularly in DBCL and anaplastic carcinoma, because DBCL is managed by chemotherapy, while anaplastic carcinoma is managed by surgical resection if the tumor can be resected [9].

There are other techniques with increased sensitivity for the diagnosis of PTL with FNA, such as flow cytometry, immunohistochemistry, and polymerase chain reaction [10]. If FNA fails to determine PTL, biopsy techniques such as core biopsy, incisional biopsy, or thyroidectomy should be considered [11]. Core biopsy diagnoses and classifies 95% of lymphomas in general cases [12]. A multidisciplinary approach is best for the management of PTL; radiotherapy, surgery, or both can be used for local control, while chemotherapy can be used for disseminated or hidden disease [5].

Our case showed clinical and radiological features of PTL, whereas FNA led to findings suspicious of either thyroid lymphoma or anaplastic thyroid carcinoma. Confirmation was obtained by tissue biopsy, which revealed DBCL; after that, the patient was put on an R-CHOP chemotherapy regimen. We conclude that DBCL is very common in PTL, although PTL is very

rare. Tissue biopsy is needed to exclude anaplastic thyroid carcinoma, and a multidisciplinary approach is necessary to manage PTL.

Statement of Ethics

Informed consent was gained from the relative for publication of this case report and the accompanying images.

Disclosure Statement

The authors deny any conflict of interest.

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Author Contributions

All authors contributed to the content of this manuscript: H. Alyami reviewed the manuscript; T. Alsofyani and M. Bu Bshait collected the data for the case report; and E.M. Al-Osail wrote the manuscript.

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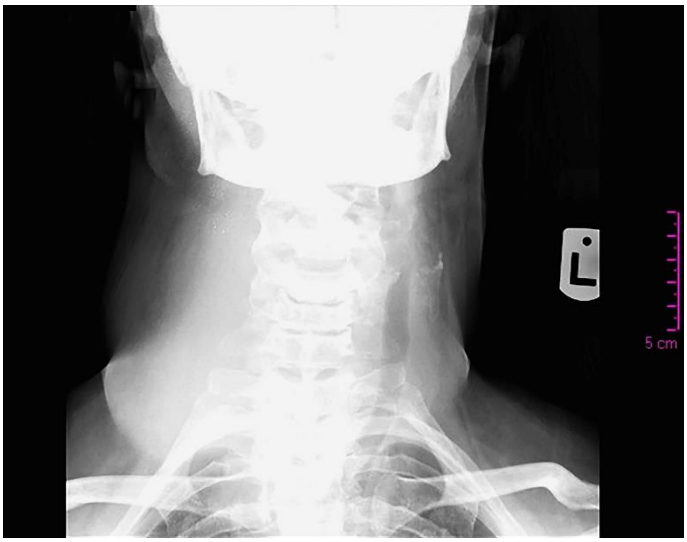

Fig. 1. Neck X-ray showing a large prevertebral soft tissue shadow reaching up to 4.8 cm in its maximum anteroposterior diameter, causing significant pushing of the trachea anteriorly and to the left side.

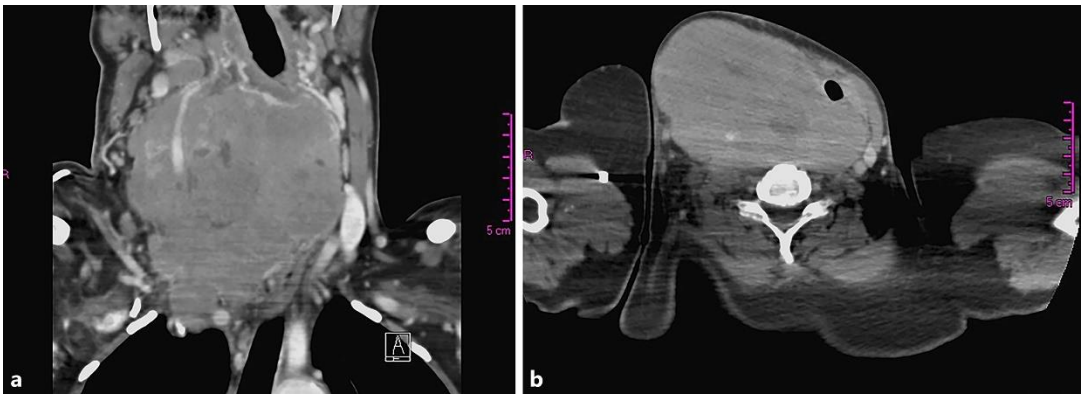

Fig. 2. CT scans of the neck. **a** Coronal view. A huge neck soft tissue mass can be seen, with compressive signs/a mass effect and vascular encasement, as well as a few pathological lymph nodes, likely of right thyroid origin, with features highly suggestive of a neoplastic lesion. **b** Axial view. There is a sizable space-occupying mass lesion most likely originating from the right thyroid gland and causing disfigurement and bulging of the right side of the neck and markedly displacing the trachea, esophagus, and left carotid sheath to the contralateral (left) side.