

Liposarcoma of the Thyroid Gland: A Case Report

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Received: February 28, 2023; Accepted: October 6, 2023; Published online: October 11, 2023

Abstract: Liposarcoma is one of the most common soft tissue tumors in adults. Liposarcoma is usually found in retroperitoneal organs and extremities, but rarely in the thyroid gland. We presented a case of dedifferentiated liposarcoma in the thyroid gland. A 56-year-old woman with a history of a lump in her neck for ten years. Malignancy was suspected due to the local extension of the tumor, therefore, complete resection of the tumor was performed. Histopathological examination showed a dedifferentiated liposarcoma. Two months post-surgery, the patient suffered from lung and brain metastases and was treated with lenvatinib. The complaints reduced and there was no significant side effect during therapy. The treatments for liposarcoma are surgery, radiotherapy, chemotherapy, and targeted therapy. Surgery followed by radiotherapy and chemotherapy is the option in the treatment of liposarcoma. This patient underwent surgery with the histopathological result of dedifferentiated thyroid liposarcoma. In the nine-month follow-up of therapy, there were no complaint of the patient. In this case, dedifferentiated liposarcoma in the thyroid gland with metastases was treated surgically followed by lenvatinib administration gave satisfactory result.

Keyword: liposarcoma; thyroid gland; dedifferentiated liposarcoma; malignant tumor

INTRODUCTION

Liposarcoma is the most common sarcoma in adults. These tumors are usually found in retroperitoneal organs and extremities. In the head and neck, liposarcomas are very rare with an incidence of only 2% of head and neck tumors.¹ However, the survival rate for sarcomas in the head and neck is lower than in other organs.² Recurrence and metastases of liposarcoma are common. Recurrence usually occurs quickly, and lungs, bones, liver, and brain are the most common sites of metastasis.^{3,4}

So far, there is no definite consensus within the literatures with respect to a comprehensive treatment recommendation in patients with a primary thyroid sarcoma. Surgery followed by radiotherapy and chemotherapy are the options in the treatment of liposarcoma. However, the survival rate in patients undergoing radiotherapy is only about 3-6 years. In the case of recurrence and metastasis, the response to adjuvant and neoadjuvant chemotherapy has not proven.³

Lenvatinib is an oral tyrosine kinase receptor inhibitor that inhibits the activity of vascular endothelial growth factor receptors (VEGFR), fibroblast growth factor receptors (FGFR) 1-3, RET, mast cells, and platelet-derived growth factor receptor (PDGFR) beta; so, it plays a role in cancer growth and development. Lenvatinib is indicated for recurrent, metastatic, or radiotherapy-refractory thyroid cancer.⁴⁻⁸

We presented a case of a 56-year-old woman with a dedifferentiated liposarcoma of thyroid. The patient was treated with surgery and then continued with lenvatinib.

CASE REPORT

A 56-year-old woman with a lump in the neck 10 years prior to hospital admission. Initially the lump grew slowly, but then it grew rapidly in the last five years. There was no history of thyroid disorders, weight loss, night sweats, difficulty in swallowing, and no history of radiation or previous trauma to the neck area. On ultrasound, it was found that the size of both thyroid lobes was enlarged, especially the right lobe. Multiple nodules were seen with solid/hypoechoic structure and calcified; no cystic structure in both thyroid lobes. Goitre multinodule solid structure showed calcification in the right thyroid lobe, and especially the right lobe had malignancy aspect. On examination fT4 0.41 ng/dL and TSHs 7.88 μ IU/mL. The fine needle aspiration biopsy (FNAB) examination revealed a follicular neoplasm. The patient underwent a total thyroidectomy, and the results showed that the thyroid tissue consisted of follicles containing colloid. However, in the part of tumor there were some tissues with thyroid follicles and most of the tumor consisted of spindle-shaped cells and oval-shaped rough hyperchromatic nuclei arranged in palisade such as fibrosarcoma. In other sections visible hyaline connective tissue fibers, myxoid tissue, tissue with vacuolated cytoplasmic fat cells and cells with mitosis. In conclusion, the diagnosis was a dedifferentiated liposarcoma of thyroid (Fig. 1). Two months post-surgery, the patient complained of dyspnea and difficulty in opening her right eye. Furthermore, the patient underwent a chest CT-scan with contrast and head MRI. The chest CT-scan with contrast resulted in multiple nodular lesions, well-defined borders, irregular edges, slightly stinging post-contrast, spread over all segments of the lung lobes bilaterally. In conclusion, there were multiple bilateral lung nodules which referred to lung metastases (Fig. 2).

Head MRI with chronic infarction of the centrum semiovale, corona radiata, and bilateral periventricular white matter, suspected small vessel ischemia, lesion of the left frontal lobe subcortical white matter referred to suggestive brain metastases. The patient was treated with corticosteroid, but there were still persistent symptoms. The patient was then treated with Lenvatinib 20 mg daily. Within one week of therapy, dyspnea was reduced and then disappeared. The right eye was slowly starting to be opened. Two months of treatment, a head CT-scan, chest CT scan, thyroid ultrasound, and abdominal ultrasound were performed. On the head CT-scan with contrast, the results showed no abnormalities. Subsequently, the chest CT-scan showed multiple nodular lesions, well-defined borders, irregular edges, in the superior and inferior lobes of the right lung and in the left superior lobe segment. The impression of suggestive of tumor metastases compared with the

previous CT scan showed better result. Thyroid ultrasound showed heterogeneous hypoechoic lesions, with multiple small linear hyperechoic components inside, relatively firm boundaries, 1.64x1.78x1.71 cm in size, and in the former right lobe area of the thyroid, a suspected granuloma suture. Abdominal ultrasound examination revealed no abnormalities.

A month later, thyroid ultrasound was performed on the patient with the result of a heterogeneous hypoechoic lesion, with multiple small linear hyperechoic components within it, relatively well circumscribed, measuring 1.86 x 1.34 x 1.79 cm, in the former right lobe area of the thyroid, suspect a granuloma suture. Due to the limited cost, the dose of Lenvatinib was reduced to 10 mg daily, but there was bleeding cough; so, the dose was returned to 20 mg daily. Furthermore, lenvatinib was taken alternately.

However, there were symptoms such as headache and difficulty opening the right eye (Fig. 3). Lenvatinib was then taken 20 mg daily again and the symptoms were gradually getting better. No significant side effects were found during therapy. In the nine-month follow-up of therapy, there were no complaint of the patient (Fig 4).

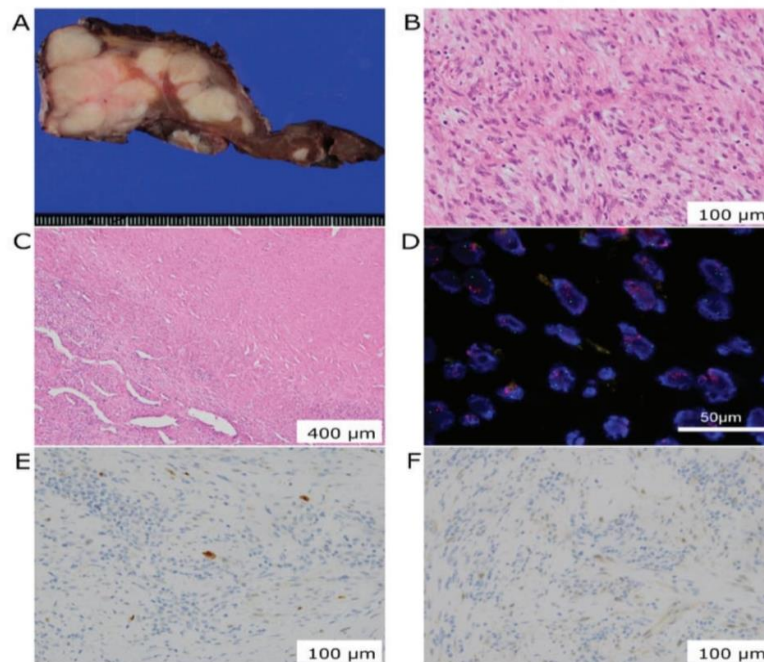


Figure 1. Histopathological findings. In the resected specimen: (A) the tumor appeared multi-nodular; (B) photomicrograph (hematoxylin-eosin staining) revealed dedifferentiated spindle cells (B) with fibrosis (C) 400 µm; Fluorescence in situ hybridization (FISH) showed MDM2 gene amplification (D, red) 50 µm, and immunohistochemistry revealed the expression of MDM2 (E) and CDK4 (F) 100 µm.



Figure 2. Chest CT-scan showed multiple nodular lesions with well-defined borders and irregular edges



Figure 3. Three months after surgery



Figure 4. Eight months after surgery

DISCUSSION

Liposarcoma is the most common sarcoma in adults, which is about 20% and usually occurs in the lower extremities and retroperitoneal organs. Liposarcoma is differentiated into well differentiated/dedifferentiated liposarcoma (WDL/DDL), myxoid and round cell liposarcoma, and polymorphic liposarcoma.⁹ Well-differentiated liposarcoma is the most common type, accounting for 40-45% of liposarcomas. Histologically, well differentiated liposarcoma is composed of mature adipocytes, atypical stromal cells, and mother fat cells. Round cell liposarcoma is more invasive and has a worse prognosis than myxoid liposarcoma. Meanwhile, polymorphic liposarcoma is rare, less than 5%.¹⁰

Primary liposarcoma of the thyroid is a very rare condition. The survival rate is lower than that of liposarcoma in other organs. In addition, recurrence and metastases are common. In a study at the Royal Marsden Hospital, the 5-year survival rate for patients with head and neck sarcoma was only about 50%.¹ In London, 2004, it was reported a 49-year-old woman with complaint of a lump in the neck for one year accompanied by shortness of breath and difficulty in swallowing since three months. The patient had a history of partial thyroidectomy 15 years previously with an unknown histopathological result. The CT scan showed a mass in the right thyroid lobe with a diameter of 7 cm, attached to the right carotid artery and internal jugular vein and extending to the right bronchus. At the time of surgery, the tumor was seen in the right thyroid lobe measuring 12 x 7 x 5 cm, attached to the trachea wall and infiltrating the pharyngeal muscle. On histological examination, the result was myxoid liposarcoma. Four weeks after surgery the patient then underwent radiotherapy to the neck and superior mediastinum. Furthermore, seven months after radiotherapy, the patient had lung and liver metastases. The patient then underwent chemotherapy with doxorubicin 60 mg/m². After one cycle of chemotherapy, the patient experienced kidney failure. The patient then died 10 months after surgery.¹ A case report in Japan, 2019, a 66-year-old male patient with well-differentiated liposarcoma of the thyroid. The patient then underwent a thyroidectomy. Two months after surgery the patient complained of a lump in the same location on the neck. Therefore, the patient underwent chemoradiotherapy. Four months postoperatively the patient had metastases in the psoas muscle, nodules in the axillae, and intrathoracic lymph nodes. Nine months after surgery the patient experienced bleeding from the lump in the neck and later died.¹⁰

The treatments for liposarcoma are surgery, radiotherapy, chemotherapy, and targeted therapy. Surgery followed by radiotherapy and chemotherapy is the option in the treatment of liposarcoma.⁹ Adjuvant radiotherapy is often recommended for cases with high-grade histopathology. Chemotherapy is indicated in cases of metastasis and recurrence, although the study did not get a good response.^{5,10} Radiotherapy in thyroid cancer have survival rate only about 3-6 years. Treatment only with radiotherapy is not recommended, except in cases where surgery is not possible. Liposarcoma is relatively resistant to radiotherapy and requires high doses, therefore, resulting in a number of side effects such as esophagitis, dysphagia, skin complaints, and body weakness.³ About 15% case of thyroid cancer are resistant to radiotherapy, thus making the poor prognosis.

Currently, there are two tyrosine kinase inhibitors, namely sorafenib and lenvatinib.³ Lenvatinib is the standard therapy for recurrent or metastatic thyroid cancer that is resistant to radiotherapy. Lenvatinib is an oral tyrosine kinase receptor inhibitor that inhibits the activity of vascular endothelial growth factor receptors (VEGFR), fibroblast growth factor receptors (FGFR) 1-3, RET, mast cells, and platelet-derived growth factor receptor (PDGFR) beta.⁴ The dose of lenvatinib for thyroid cancer is 24 mg daily for 28 days and continued as long as symptoms improve and no toxic symptoms are found. If there is improvement, the dose can be reduced gradually starting from 20 mg daily, 14 mg daily, up to 10 mg daily.^{6-8,11} Side effects of using lenvatinib include hypertension, kidney disorders, liver disorders, heart problems, tingling, bleeding, perforation of the gastrointestinal tract, proteinuria, diarrhea, hypocalcemia, and impaired thyroid function. Therefore, it is necessary to monitor blood pressure, complete blood count, calcium, kidney function, liver function, thyroid function, and ECG when taking lenvatinib.⁹

This patient underwent surgery with the result of dedifferentiated thyroid liposarcoma. Two months after surgery, she complained of dyspnea and difficulty in opening her eyes. On radiological examination there were metastases to the brain and lungs. Albeit, the patient was not given radiotherapy and chemotherapy, and was treated with lenvatinib at a dose of 20 mg per day. Complaints of difficulty in opening her eyes and dyspnea were gradually getting better. Radiological examination showed some improvement. The dose of lenvatinib was reduced to 10 mg and taken alternately, but the complaints reappeared. When the dose was increased to 20 mg daily, the complaints were gradually improved. There were no significant side effects when lenvatinib was given. In the nine-month follow-up of therapy, there were no complaints of the patient.

CONCLUSION

Liposarcoma in thyroid is rare and has a poor prognosis. Recurrence and metastasis are common. Surgery followed by administration of lenvatinib gave a good response for the treatment.

Conflict of Interest

The authors affirm no conflict of interest in this study.

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