



Case Report

Isolated Sternal Metastasis Arising from Well Differentiated Thyroid Carcinoma

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Abstract: Secondary lesions to the sternum are uncommon and occur more commonly in patients with lung and breast cancer. Only a few cases of sternal metastasis arising from a follicular thyroid carcinoma have been reported in the literature. The management of this kind of metastasis remains controversial. We describe a case of a sternal mass treated by radical surgery and Iodine radiation, which ultimately proved to be a solitary metastasis from a follicular carcinoma of the thyroid, appearing 20 years after subtotal thyroidectomy. A review of the literature was also performed to evaluate the characteristics of reported cases of sternal thyroid cancer metastases treated with surgical resection. According to the results we recommend surgical resection of the metastasis, not only as a curative or palliative measure but also to maximize the effect of subsequent radioiodine treatment.

Keywords: Thyroid Cancer, Metastasis, Sternal Tumor, Surgery

1. Introduction

Carcinoma of the thyroid gland is an uncommon cancer. Differentiated tumors (papillary or follicular) are highly treatable and usually curable but the existence of metastases to both bone and lung worsen the prognosis even if they are isolated [1]. Sternal metastasis arising from a thyroid carcinoma is rare. Sternum involvement occurs essentially by lymphatic or hematogenous spread [2] it can occur also by direct extension [3]. Management of sternal metastasis remains controversial. Only isolated cases have been reported in the literature which showed a good outcome with aggressive approach “[1], [2], [3], [4], [5]”. We report a case

of isolated sternal metastasis arising from well differentiated thyroid carcinoma treated by radical surgery associated with Iodine radiation with good outcome.

2. Observation

A 54-year-old woman presented with history of subtotal thyroidectomy 8 years ago. Since three months, she presented a sternal swelling that was painless in physical examination. There was also a palpable left thyroid goiter. Chest computed tomography (CT) performed noted a lytic lesion involving the upper sternum with sternoclavicular joints (Figure 1). This mass was without continuity with a left goiter (figure 2).

The patient had a normal T4 and thyroid-stimulating hormone

levels. She was referred to our institution for complementary investigation. A fine needle biopsy of the sternal lesion was performed, with histopathologic report of follicular neoplasm. The sternal metastasis was deemed resectable. Intraoperatively, the mass was found to extend from the sternomanubrial junction to the sterno clavicular joints. In another side there was no mediastinal organs involvement. Subtotal sternotomy with 4 cm margins including costochondral joints and sterno clavicular joints resection was performed. Negative margins were achieved by frozen section analysis. By other the goiter was removed (figure 3).



Figure 1. A computed tomogram showing a heterogeneous soft-tissue mass involving the upper part of the sternum and extending into the anterior mediastinum. The major vessels are not involved.



Figure 2. A computed tomogram showing no continuity with the goiter.



Figure 3. Operative specimen of partial sternotomy (A) (arrow: the Manubrium) and thyroidin lobectomy (B).

A thoracic drain (ch 28) was left in the mediastina as well as two radon drains (ch 14) each one in the thyroid lodge and under the thoracic incision. The sternal defect was reconstructed by Polypropylene Mesh and covered by mobilization of major pectoralis muscle flap (figure 4).

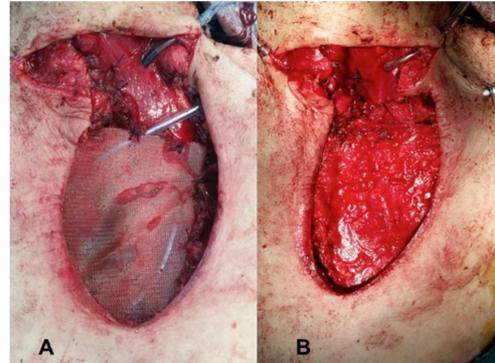


Figure 4. Reconstruction of parietal defect by layer of polypropylene mesh (A) which is covered by pectoralis major muscle flap (B).

The drains were removed four days after and the patient was discharged on postoperative day 06 after an uneventful postoperative course. Final pathology proved the sternal mass to be a well differentiated follicular thyroid carcinoma, involving soft tissues, bone and cartilage (Figure 4).

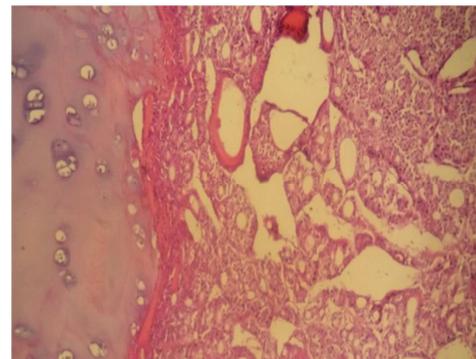


Figure 5. Microscopic appearance of follicular carcinoma with follicular cell differentiation composed of small to medium sized irregularly follicles infiltrating the sternum. (Hematoxylin and Eosin x 250).

The patient underwent 131I ablation therapy at a dose of 100 mCi. 1 year later, the patient was still completely asymptomatic with a normal thyroglobulin level.

3. Comment

Carcinoma of the thyroid gland is an uncommon cancer but is the most common malignancy of the endocrine system [4]". In the opposite of papillary carcinoma which spread by lymphatic into local lymph nodes, follicular carcinoma presents a hematological spread with metastases more frequently in the lungs and bones [4]". Patients with well-differentiated thyroid cancer may present with extra cervical metastasis in 5–10% of cases at diagnosis [7]". Primary and metastatic malignancies of the sternum are uncommon [4]". Lesions to the sternum occur more commonly in patients with

lung and breast cancer, and only a few cases of sternal metastasis arising from a thyroid carcinoma have been reported in the literature “[8], [9], [10]”. Indeed, the sternum represents the fifth metastatic site of thyroiodin carcinoma after the pelvic girdle, ribs, Columna Vertebralis and skull. The sternal involvement is mainly by the lymphatic or hematogenous spread and more rarely by continuity from metastatic cervical nodes [11]”. Pain, ulceration, and dyspnea are possible symptoms, which occur at later stages in these patients and affect their quality of life, as reported by Kitamura et al [12]”. Also patients with sternal disease may present superior vena cava syndrome, with consequent circulatory arrest and possible immediate death “[12], [13]”. The prognosis of patients with differentiated thyroid cancer is excellent and 10-year survival is >90% [13]”. but the presence of bone metastases, either alone or in combination with other metastases, significantly worsens the prognosis, as bone metastases do not respond effectively to radioiodine ablation “[4], [7], [14]”. which is the gold-standard for treatment of metastatic thyroid carcinoma [6]”. Sternal resection is an important palliative option for patients with thyroid cancer metastases to the sternum. The absolute benefit of resecting solitary thyroid cancer bony metastases is controversial [1]”. Given the insensitivity of bone metastases to radio- active iodine, surgical treatment has been strongly recommended by many surgeons [15]”. However metastasectomy is only justified if there is a single metastasis, the primary thyroid cancer is totally resectable and general state of the patient allows it [6]”. The parietal defect can be covered by many muscle flaps and prosthetic materials. In our case, the chest wall defect was reconstructed by two layers of polypropylene mesh and covered by mobilization of major pectoralis muscle flap [4]”. Smaller retrospective studies revealed that the combination of metastasectomy and radio- iodine treatment, which surgery can enhance the effect [16]”, has a favorable effect on prognosis and the patient’s quality of life [10]”. In fact complete resection of the tumor and the sternum would offer Long-term control of sternal metastatic thyroid carcinoma. “[8], [10], [17]”. In our case, the resection of the osseous sternal metastasis had in our opinion a favorable outcome on our patient’s prognosis and quality of life.

4. Conclusion

Sternal metastasis from well differenced thyroid carcinoma is uncommon and surgical therapy if possible is a good option. It can be curative and can provide symptomatic palliation, prolongs overall survival and allows for more effective radio-iodine treatment to pulmonary and visceral metastasis or local recurrence.

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