

# Follicular Thyroid Carcinoma with Unusual Pulsatile Sternal Metastasis: A Rare Case Report

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**Abstract:** Follicular thyroid carcinoma (FTC) seldom develops sternal metastases; just 15 cases have been documented in the literature, and the majority of these cases arise from lung and breast cancer. We present a 72 - year - old female patient who presented with swelling over the upper part of the sternum for 1 month. The swelling was insidious in onset and associated with pain and pulsatile. Total thyroidectomy was performed and postoperatively chemotherapy was started in the form of bisphosphonates. Patients with FTC can be treated with total thyroidectomy and systemic therapy i. e. chemotherapy in the form of bisphosphonates, especially in cases of sternal metastasis, and lifelong thyroxine where required, hence inferring real survival benefit.

**Keywords:** Follicular thyroid carcinoma, sternum, metastasis, case report

## 1. Introduction

FTC is the second most prevalent type of thyroid cancer after papillary carcinoma. It makes up 10–20 % of all thyroid cancers and is most frequently diagnosed in people over 40 [1]. It is characterized by hematological spread with metastases occurring more frequently in the lungs (49 %) and bones (7 - 28%). The spine is the most common site of bone metastases (33.9 %), followed by the pelvis (30.5%), skull (27.1 %), long bones (16.9 %), and sternum (11.9 %). The prognosis is generally worse for those with metastatic disease, as the ten - year survival rate drops down to 3 - 21% in the presence of bone metastasis [2]. On the other hand, additional treatments may lower the burden of tumors for some of these patients, providing them with survival or palliative benefits. Patients with metastatic thyroid cancer can undergo surgical excision, external - beam radiation, radioactive iodine therapy with I - 131, or enrollment in clinical trials as treatment options [3]. However, well - differentiated thyroid cancer with direct invasion or bone metastases to the sternum is uncommon and has rarely been reported.

## 2. Case Report

A 72 - year - old female presented to our hospital with a complaint of swelling over the upper part of the sternum for 1 month. The swelling was insidious in onset, initially of size 1x1 cm and gradually progressing to 7x6 cm (figure 1). The swelling was associated with pain and was pulsatile.

USG local was done, suggesting a neoplastic etiology. For further correlation, senior USG neck and thyroid was done, suggesting a neoplastic etiology in the bilateral lobes of the thyroid.

CECT neck, thorax, and abdomen were done revealing neoplastic etiology in the left lobe of the thyroid and a soft tissue density lesion in the upper 1/3rd part of the sternal body and posterior aspect of the left 3<sup>rd</sup> rib likely representing bony metastasis (figure 2).

USG - guided FNAC was done from the left lobe of the thyroid which was suggestive of Bethesda Category 4 Follicular carcinoma and from sternal swelling which was suggestive of metastatic deposits of follicular thyroid carcinoma in the sternum.

A total thyroidectomy was performed (figure 3). The specimen was sent for histopathological examination which confirmed the diagnosis of Follicular Carcinoma of the Thyroid (figure 4).



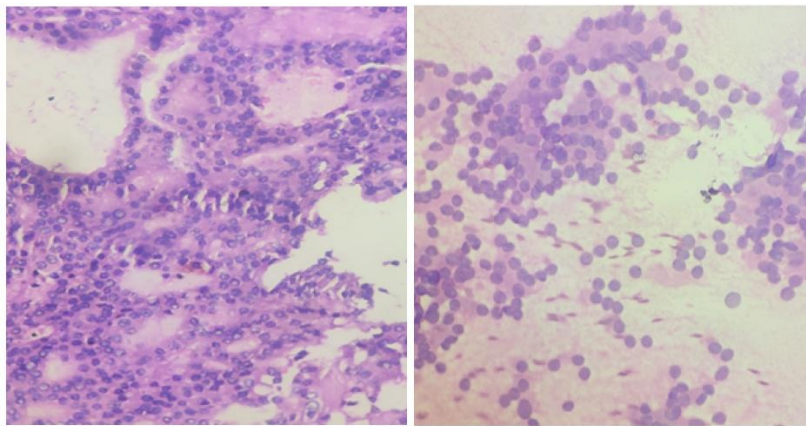
**Figure 1:** Pulsatile mass over sternum of size 7 x 6 cm



**Figure 2:** CECT showing neoplastic etiology in the left lobe of the thyroid



**Figure 3:** Gross specimen of a total thyroidectomy



**Figure 4:** HE stains at 40x showing thyroid follicular cells arranged in micro follicles with focal nuclear overcrowding and overlapping F/S/O Follicular Neoplasm - BETHESDA category 4.

### 3. Discussion

Metastatic Tumors to the sternum are rare, commonly originating from lung or breast cancer. While thyroid carcinoma rarely metastasizes to the sternum, distant metastases of differentiated thyroid cancer are usually localized to the lung and bone. The brain, liver, and skin are rarely involved. Approximately 3–4 % of patients diagnosed with follicular thyroid carcinoma have distant metastasis at the time of presentation [4]. Metastasis of thyroid carcinoma to the sternum is rarely reported [5]. In one study, the spine was the commonest site of follicular thyroid cancer metastasis accounting for 33.9 % of cases followed by the pelvis 30.5%, the skull 27.1 %, and long bones 16.9 %. As for sternum and

ribs, they were involved in 11.9 % of the cases each. Sometimes, the metastatic focus can be the presenting feature as in our patient [6]. Therefore, when managing FTC, special attention and knowledge of the pattern of metastases and their impact is crucial. Sternal metastasis from differentiated thyroid carcinoma presents a conundrum for surgeons.

For FTCs with a diameter >4 cm, a total thyroidectomy is proposed. For FTCs with a tumor diameter >1 and ≤4 cm, hemithyroidectomy is considered a sufficient treatment. For patients with metastasis to bones and soft tissues, either radiotherapy, chemotherapy, or both are indicated after the total thyroidectomy. Chemotherapy that has been reported to control tumor progression and prolong progression - free survival includes tyrosine kinase inhibitors such as sorafenib,

lenvatinib, vandetanib, and cabozantinib [7]. Newer agents working through new pathways are also tested with some good responses [8]. Thyroglobulin levels are measured to monitor for recurrence [9].

In our case, a Total thyroidectomy was performed by raising bilateral subplatysmal flaps and incising strap muscles. Bilateral recurrent laryngeal nerves and external laryngeal nerves were identified and preserved and related vessels were identified and ligated. The thyroid gland was separated from the trachea followed by the insertion of a minivac and closure of strap muscles and skin incision. The specimen was sent to the histopathology section for evaluation. Sternal swelling was left unaltered. Post operative chemotherapy was given in form of iv bisphosphonates and was advised for regular follow up.

#### 4. Conclusion

FTC metastasis to the sternum is rare and challenging. Patients with FTC can be treated with total thyroidectomy and systemic therapy i. e. chemotherapy in the form of bisphosphonates, especially in cases of sternal metastasis, and lifelong thyroxine where required, hence inferring real survival benefit.

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