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Case Report

Oncology Section

# Follicular Variant Papillary Thyroid Carcinoma with Rare Oral and Sternal Metastases: A Case Report

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## ABSTRACT

Metastatic spread of Differentiated Thyroid Carcinoma (DTC), including its Follicular Variant of Papillary Thyroid Carcinoma (FV-PTC), to the oral cavity is extremely rare, with the hard palate being an exceptionally uncommon site. A 65-year-old female with a history of total thyroidectomy for FV-PTC presented with a painful, progressively enlarging swelling in the left posterior maxilla and sternum. The patient had undergone total thyroidectomy six years prior to the current presentation. Examination showed a diffuse, firm palatal mass with submandibular lymphadenopathy and restricted mouth opening. Imaging revealed an extensive destructive lesions of the skull base and sternum with vascularity and calcification. Cytology from the sternum confirmed metastatic PTC, whereas the initial maxillary biopsy showed granulomatous changes, highlighting the diagnostic challenge. The patient was started on lenvatinib 4 mg daily, later escalated to 8 mg daily, resulting in a marked and sustained regression of both palatal and sternal lesions over twelve months without significant toxicity. This case highlights the importance of repeat biopsy in atypical oral lesions, the need for meticulous clinicopathological correlation, and the therapeutic value of targeted agents in advanced thyroid carcinoma.

**Keywords:** Lenvatinib, Palatal neoplasms, Sternum, Thyroid neoplasms

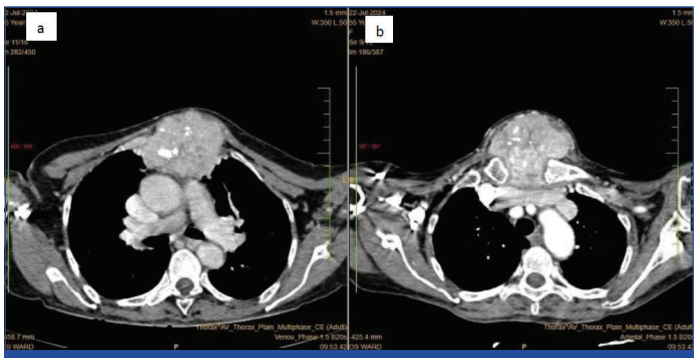
## CASE REPORT

A 65-year-old woman, a known case of follicular-variant papillary thyroid carcinoma, presented with a painful, non-healing ulcer over the left posterior jaw that had been progressively enlarging over six months. Initially pea-sized, it gradually increased to 5×4 cm, associated with dull, intermittent pain aggravated by mastication, and a burning sensation on intake of spicy foods. She also reported difficulty in mastication and deglutition. There was no history of weight loss, paresthesia, or altered salivary flow. The patient had undergone total thyroidectomy six years earlier for PTC, follicular variant. No postoperative thyroglobulin levels or interval surveillance records were available for the intervening follow-up period. There was no documented history of systemic illnesses such as hypertension, diabetes, tuberculosis, jaundice, renal disease, cardiac disorders, prior radiation therapy, or nuclear medicine-based treatments. The patient had undergone tubal ligation approximately 25-30 years ago. There was no history of blood transfusion. She had been receiving thyroid hormone replacement with levothyroxine 75 µg daily. Apart from lenvatinib initiated during the current presentation, she was not on any other regular medications, and no known drug allergies were reported. The clinical photograph demonstrates two distinct swellings marked by arrows. Intraoral examination revealed a diffuse, firm to hard lump measuring 4×3 cm over the left hard palate, extending from the midline to the maxillary tuberosity and posteriorly towards the pharynx, resulting in markedly restricted mouth opening of 12 mm. Due to the severe trismus and extensive underlying osteolytic involvement, complete intraoral examination and intraoral imaging were not feasible. A lesion was present on the left side of the face, extending anteroposteriorly from the tip of the nose to the left earlobe, and superoinferiorly from the left supraorbital margin to the lower border of the mandible. The nasal septum was deviated toward the right side. The mass measured approximately 6×4 cm, was roughly oval, and had diffuse margins with overlying skin of normal colour, indicated by the (yellow arrow). On palpation, it was firm to hard in consistency, non-tender, and not warm to the touch. Multiple left submandibular lymph nodes (3×2 cm, mobile, hard, and tender) were palpable. The (blue arrow) highlighted an additional area of metastatic mass in the sternum. A well-defined anterior chest wall mass was noted over the upper sternum and anterior neck, measuring approximately 6× 5 cm. The lesion produced localised prominence over the manubrium. The overlying skin appeared normal, without erythema, ulceration, or visible pulsations. On palpation, the mass was firm to hard in consistency, non-tender, and non-fluctuant. There was no local rise in temperature. The mass was fixed to both underlying bone structures and overlying skin, with no mobility in the vertical or horizontal planes, suggesting bony involvement. No bruit was audible. Regional lymphadenopathy was noted in the supraclavicular and prevascular regions [Table/Fig-1].

**[Table/Fig-1]:** Clinical photograph (yellow arrow) showing diffuse left facial enlargement with intraoral extension over the left hard palate from the midline to the maxillary tuberosity; (blue arrow) showing a well-defined anterior chest wall mass over the upper sternum and anterior neck measuring approximately( 6×5) cm, producing localised prominence over the manubrium.

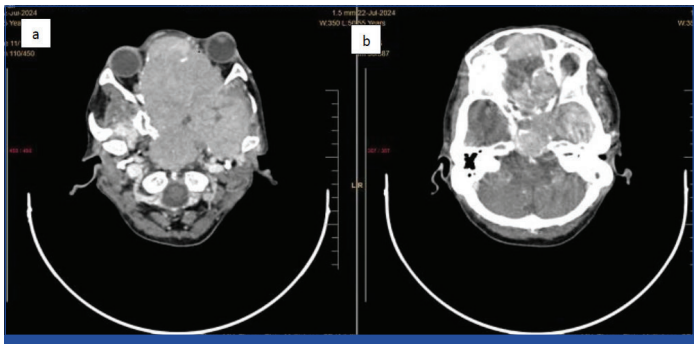
## Investigations

The Contrast-enhanced CT (CECT) of the face, neck, and thorax demonstrated a large recurrent thyroid bed mass (9.8×7.2×6.4 cm) with calcifications, extending into the subcutaneous tissue, arch of the aorta, pulmonary artery, and left brachiocephalic vein, with erosive lysis of the manubrium sterni and clavicles [Table/Fig-2].




**[Table/Fig-2a,b]:** Axial CECT thorax demonstrating a metastatic deposit involving the sternum, presenting as a large soft-tissue mass with internal calcifications, consistent with metastatic thyroid carcinoma.

Multiple heterogeneously enhancing supraclavicular, prevascular, and bilateral hilar lymph nodes were present, consistent with metastatic disease. A destructive skull base lesion (7.4×9.2×6.6 cm) involved the sphenoid, clivus, and left greater wing, with intracranial extension encasing bilateral internal carotid arteries, and spread into the paranasal sinuses, nasal cavity, hard palate, maxilla, mandible, orbit, and adjacent fossae [Table/Fig-3].

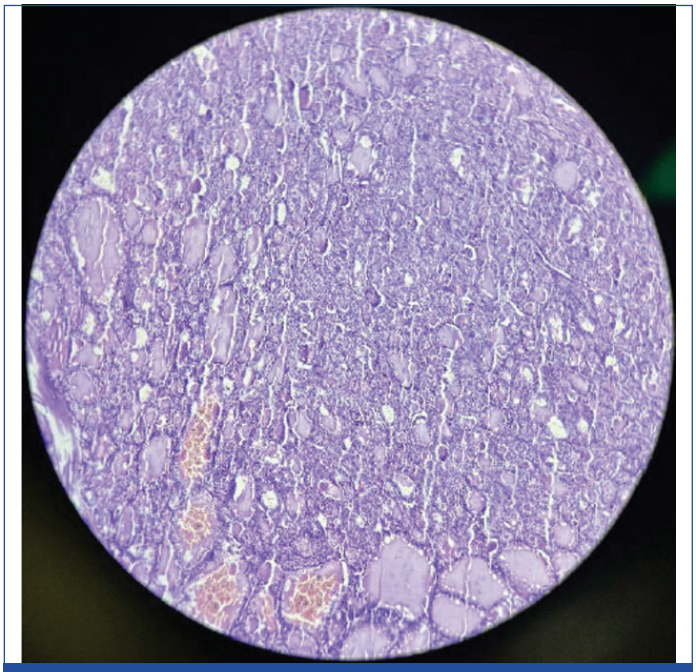



**[Table/Fig-3]:** a) Axial CECT face and neck showing tumour extension into the maxilla, mandible, orbit, and adjacent fossae, including nasal cavity; and b) shows a destructive skull base lesion with intracranial extension and involvement of paranasal sinuses.

Bilateral pulmonary nodules (largest 8.4×8 mm) suggested pulmonary metastases, while liver lesions (largest 2.7×2.1 cm in segment V) were more consistent with haemangioma. Vertebral haemangioma was noted at D1, D2, and D5. Ultrasound with Doppler of the sternal lesion demonstrated a lobulated, heterogeneous, well-defined mass measuring 9×5.3 cm with internal vascularity, calcification, and regional lymphadenopathy. USG abdomen revealed multiple right renal cysts and a haemangioma in segment IV of the liver. Serum thyroglobulin (Tg) was significantly elevated to 400 ng/mL (reference range: 0.5-43.0 ng/mL, and <1 ng/mL in post-thyroidectomy patients). No direct treatment was required for elevated thyroglobulin itself; rather, the elevated level indicates biochemically active recurrent/metastatic DTC. In this patient, the high Tg value correlated with extensive structural disease involving the hard palate, skull base, sternum, and lungs, confirming disseminated metastatic burden. Systemic therapy with oral lenvatinib was therefore initiated (4 mg daily, later escalated to 8 mg) for radioiodine-refractory metastatic disease, with marked clinical response. Based on the clinical features, imaging and cytology, the provisional diagnosis was recurrent metastatic follicular-variant PTC. Differential diagnoses considered included metastatic thyroid carcinoma to bone; metastatic deposits from other primaries (lung, breast, renal, melanoma); primary maxillary/palatal malignancy; granulomatous lesions (e.g., foreign-body granuloma, TB, fungal granuloma); and primary osteolytic bone tumours of the sternum or skull base, all of which were excluded on repeat cytology and correlation with elevated thyroglobulin levels.

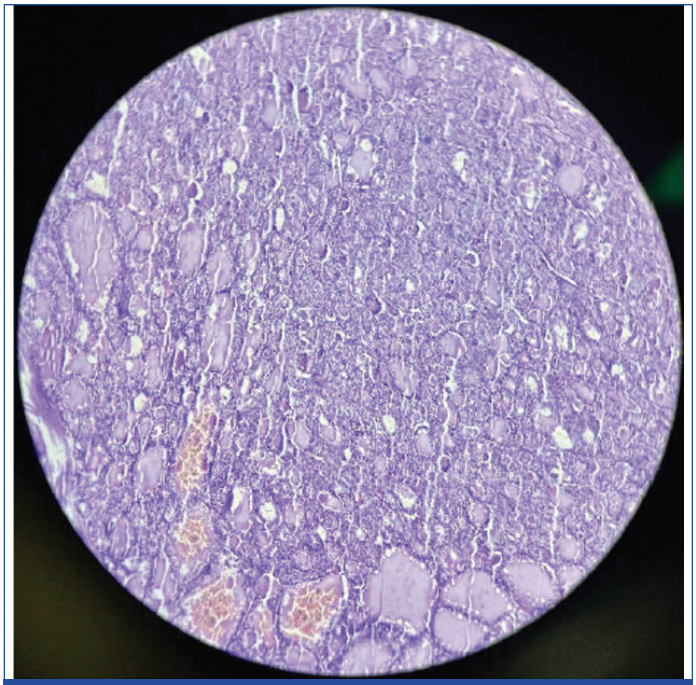
## Histology/Cytology

The patient had a past history of thyroidectomy six years ago, when histopathology had confirmed PTC, follicular variant [Table/Fig-4].



**[Table/Fig-4]:** H&E, 20× showing follicular arrangement lined by follicular cells with nuclear features of Papillary Thyroid Carcinoma (PTC), like nuclear membrane irregularity and enlarged, elongated, overlapping nuclei with chromatin clearing (ground-glass appearance), Bubble gum colloid with scalloping also noticed.

Biopsy from the maxillary lesion initially showed granulomatous tissue without malignant cells. However, FNAC from the sternal mass revealed deposits of follicular thyroid carcinoma. Repeat cytology from the maxilla showed a foreign body granulomatous reaction with minor salivary gland elements, while the sternal lesion was reconfirmed as metastatic follicular variant of the PTC [Table/Fig-5].



**[Table/Fig-5]:** FNAC from the sternal mass showing small sheets of thyroid follicular cells in syncytial pattern with enlarged irregular nuclei, mild pleomorphism and granular chromatin, suggestive of follicular variant of Papillary Thyroid Carcinoma (PTC) (Giemsa, 40x).

## Management

A diagnosis of recurrent metastatic FV-PTC with palatal and sternal deposits (Stage rT4aN2bM1) was established. The patient was started on oral lenvatinib 4 mg daily, a multikinase inhibitor targeting VEGFR, FGFR, RET, and KIT pathways, which had proven efficacy in advanced thyroid carcinoma with distant metastases. The initial oral dose of lenvatinib was 4 mg daily for three months. No adverse drug effects of lenvatinib, such as hypertension, renal failure, hepatotoxicity, cardiac impairment, QT interval prolongation, or posterior reversible encephalopathy syndrome, were noted. After regular treatment, there was a significant reduction in the facial and sternal metastatic swellings.

## Follow-up

After significant tumour reduction, the dose of lenvatinib was increased to 8 mg daily and was maintained thereafter without toxicity. At 12 months of therapy, complete regression of the facial lesion and near-complete reduction of the sternal mass were observed, which indicated a favourable therapeutic response [Table/Fig-6].


**[Table/Fig-6a,b]:** Clinical photographs showing complete regression of the facial swelling and near-complete reduction of the sternal mass following treatment.

# DISCUSSION

The DTC is the most common endocrine malignancy, with PTC constituting the majority of cases [1]. FV-PTC combines the nuclear features of papillary thyroid carcinoma with a follicular architectural pattern and typically follows an indolent clinical course of PTC with a follicular architectural pattern and usually follows an indolent clinical course [2]. Although the overall prognosis of PTC is excellent, with 10-year survival rates exceeding 90% [3], FV-PTC may demonstrate a greater tendency for haematogenous dissemination similar to follicular carcinoma, leading to atypical metastatic spread [4]. The lungs and bones are the most frequent distant metastatic sites, whereas oral cavity involvement accounts for <1% of all oral malignancies [5,6]. Metastasis to the hard palate is exceptionally uncommon. Such lesions may mimic squamous cell carcinoma, salivary gland neoplasms, or benign granulomatous conditions, resulting in diagnostic delay [7,8]. In the present case, the initial palatal biopsy showed granulomatous tissue without malignant cells, highlighting the diagnostic difficulty. A similar challenge was noted by Varadarajan VV et al., who reported a metastatic PTC to the maxilla/facial skeleton initially misdiagnosed as a primary oral lesion [9]. Reports of maxillary and palatal metastases from follicular carcinoma also exist but remain exceedingly rare [9]. A concise summary of published cases is provided in [Table/Fig-7] [10-20]. This Table/Figure shows that palatal involvement is extremely rare and often mimics benign lesions. Sternal metastasis is also very uncommon and is only rarely reported. Most cases show persistent metastatic disease, whereas the present case demonstrates a marked and sustained response to lenvatinib.

When compared with previously reported cases, the patient demonstrated an unusually aggressive metastatic pattern. Most published cases describe isolated maxillary or mandibular metastases with or without pulmonary involvement. In contrast, the present patient showed simultaneous involvement of the hard palate, skull base, and sternum, along with lung nodules, an extent of spread that is exceptionally uncommon in the literature. Moreover, while most reports document management with surgical resection and radioiodine therapy, our case achieved substantial regression of bulky metastatic lesions with systemic targeted therapy alone. This makes the case distinctive both in anatomical distribution and therapeutic response. The presence of sternal destruction reflects advanced disseminated disease. Bone metastases from DTC significantly worsen prognosis and survival [21]. Elevated serum thyroglobulin levels and cross-sectional imaging supported the presence of widespread metastases in this patient. For radioiodine-

| No. | Author (Year) with reference | Age/Sex | Histology | Oral metastasis | Sternal Metastasis | Management | Outcome |
|---|---|---|---|---|---|---|---|
| | Khoozestani NK et al., (2019) [10] | Adult | Papillary | Mandible | Not reported | Resection + thyroid management | Alive at follow-up Controlled disease |
| | Gholami S et al., (2020) [11] | Adult | Papillary | Anterior mandible | Not reported | Resection + thyroid management | Good local control; Nodal disease treated |
| | Shimmura H et al., (2020) [12] | 76/F | Papillary | Maxillary sinus | Not reported | Resection | Symptom relief; follow-up not reported |
| | Barai R et al., (2021) [13] | 68/F | Papillary | Mandible | Not reported | Case report | Outcome not detailed beyond surgery |
| | Awny S et al., (2022) [14] | 36/M | Papillary | Maxilla / paranasal /oral | Not reported | Resection + RAI | Good local control; Distant disease persists |
| | Jawanda MK et al., (2022) [15] | 55/M | Follicular | Mandible | Variable | Resection ± RAI | Survival reported as a part of systematic review |
| | Steffens Y et al., (2022) [16] | 39/M | Papillary | Frontal sinus / facial bones | Not reported | Resection + thyroid workup | No recurrence on early follow-up |
| | Nayyar V et al., (2023) [17] | Adult | Papillary/Follicular | Mandible | Not reported | Resection | Disease-free on reported follow-up |
| | Raffaelli SD et al., (2023) [18] | Adult | Papillary | Mandible | Not reported | Resection | Good postoperative recovery; Short follow-up |
| | He R et al., (2024) [19] | Adult | Ectopic follicular | Mandible (ectopic thyroid) | Not reported | Resection + thyroid evaluation | No recurrence at short follow-up |
| | Oda T et al., (2024) [20] | Adult | Papillary | Maxillary gingiva (Incidental) | Not reported | Imaging diagnosis → workup | Stable disease; Early-stage metastasis |
| | Present case (2025) | 65/F | FV-PTC | Hard palate | Sternum, skull base, bone, lung and cervical nodes | Lenvatinib ± Resection | Clinically significant regression over 12 months |

**[Table/Fig-7]:** Summary of reported cases of thyroid carcinoma with oral cavity and sternal metastasis [10-20].

refractory metastatic DTC, Tyrosine Kinase Inhibitors (TKIs) remain the recommended therapeutic option. Lenvatinib, a multikinase inhibitor of VEGFR, FGFR, RET, and KIT, has demonstrated substantial clinical benefit. In the SELECT trial, lenvatinib significantly improved progression-free survival to 18.3 months compared with 3.6 months in the placebo arm [5]. Real-world studies further support the efficacy of lower initial doses with subsequent escalation, allowing improved tolerability without compromising tumour control [22]. In this case, lenvatinib initiated at 4 mg and escalated to 8 mg resulted in marked regression of both palatal and sternal metastatic masses within twelve months, with no significant toxicity. This favourable outcome aligns with emerging evidence suggesting that low-dose lenvatinib protocols can be safe and effective in selected patients. The present report underscores both the diagnostic complexity of oral metastatic lesions from thyroid carcinoma and the therapeutic value of lenvatinib in advanced, metastatic DTC.

## CONCLUSION(S)

Metastatic spread of thyroid carcinoma to the oral cavity is extremely uncommon, accounting for <1% of oral malignancies. The palate is an exceptionally rare site for metastasis and may clinically mimic a primary maxillary carcinoma. A thorough history, cytology, and imaging are critical for diagnosis, especially when the presentation is misleading. This case highlights the diagnostic challenge posed by granulomatous reactions on biopsy and the importance of repeated sampling from suspected sites. Lenvatinib has proven efficacy in advanced thyroid carcinoma with distant metastases. Its use in this patient resulted in significant disease regression, emphasising its role in the management of metastatic disease.

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