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Case Report

Mandibular Metastasis as a Rare Presentation of Follicular Variant Papillary Thyroid Carcinoma: A Case Series

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ABSTRACT

Introduction*: Papillary thyroid carcinoma (PTC) is the most common endocrine malignancy. The follicular variant of papillary thyroid carcinoma (FV-PTC) represents a distinct histologic subtype that tends to spread hematogenously to distant organs, including bone. Mandibular metastasis from FV-PTC is exceedingly rare and may pose a diagnostic challenge, particularly when it precedes recognition of the primary thyroid lesion.* ***Presentation of case****: We report two Asian female patients presenting with mandibular masses. The first patient had a history of total thyroidectomy for papillary thyroid carcinoma (follicular variant) ten years earlier. Imaging revealed an extensive osteolytic lesion of the right mandible. Histopathology of an incisional biopsy confirmed metastatic PTC, and the patient underwent right hemimandibulectomy with immediate reconstruction using a titanium plate. The second patient presented with a large, painful left mandibular mass without any history or clinical evidence of thyroid disease. Imaging showed a destructive lytic lesion of the left mandible, while neck ultrasonography revealed no thyroid enlargement. Biopsy suggested FV-PTC of thyroid origin. The patient underwent left hemimandibulectomy with titanium plate reconstruction. Final histopathology in both cases confirmed FV-PTC metastasis to the mandible.* ***Conclusion:*** *Mandibular metastasis from FV-PTC is a rare manifestation that may occur as late recurrence after*

thyroidectomy or as the first indication of an occult thyroid carcinoma. Comprehensive diagnostic workup and appropriate surgical reconstruction are crucial to achieve local disease control and preserve function. Clinicians should consider metastatic thyroid carcinoma in the differential diagnosis of lytic mandibular lesions, even in the absence of a palpable thyroid

1. INTRODUCTION

Papillary thyroid carcinoma (PTC) is the most prevalent endocrine malignancy, accounting for approximately 80-90% of all thyroid malignancies.[1] Global cancer statistics (GLOBOCAN 2022) indicate that thyroid cancer ranks seventh globally, with a significant incidence in Asia.[2] The he Follicular Variant of Papillary Thyroid Carcinoma (FV-PTC) is a subtype that, unlike classical PTC, often exhibits a higher propensity for hematogenous spread to distant sites such as the lungs and bones.[3] Histologically, FV-PTC displays a follicular growth pattern but retains the nuclear features characteristic of PTC.

Distant metastasis from differentiated thyroid carcinoma (DTC) is rare, occurring in only 5–7% of patients, with bone metastasis found in approximately 4% of cases.[4,5] The mandible is an exceptionally uncommon site for skeletal metastasis. This location presents a particular diagnostic challenge, especially when the osseous manifestation precedes the diagnosis of the primary thyroid tumor. Metastasis to the mandible accounts for approximately 1% of all oral malignancies.[6]

This report describes two rare cases of mandibular metastasis from FV-PTC with distinct clinical courses: one representing a late recurrence and the other an initial presentation of an occult primary. The primary aim of this article is to detail the comprehensive diagnostic workup and surgical management, highlighting the importance of thorough evaluation in these rare presentations.

2. CASE PRESENTATION

2.1 Case 1

A 49-year-old Asian female presented to the oncology clinic with a progressive, painful mass on the right mandible (Figure 1). The mass had been enlarging slowly over two years and was palpable as a hard, solid lump. The patient reported intermittent pain but had no dental occlusion disturbances or sensory deficits in the lower alveolar nerve distribution.

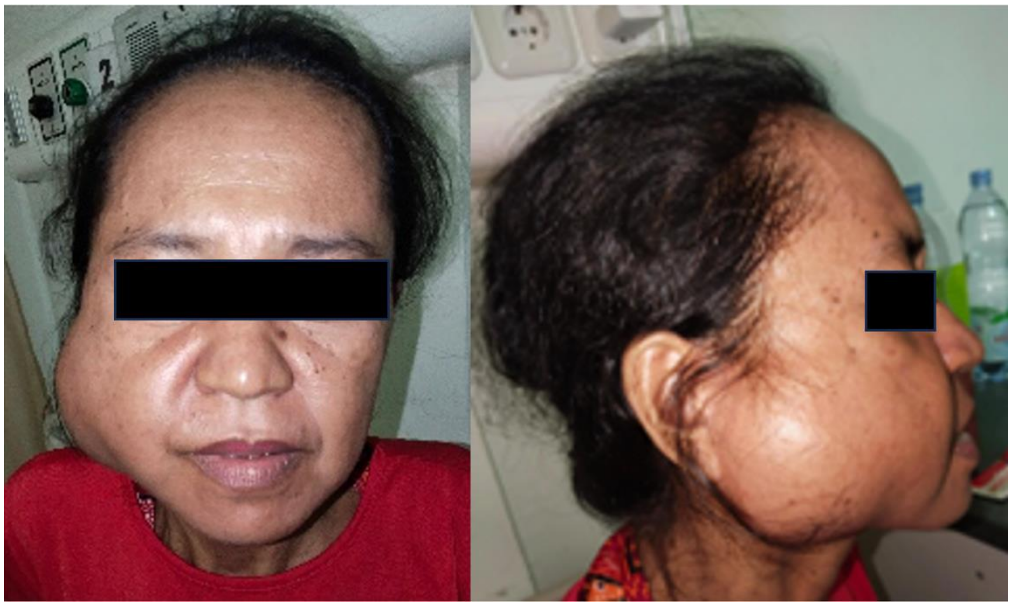

Figure 1. Extraoral clinical photograph of Case 1 demonstrating a firm, expansile swelling in the right mandibular body and angle region, causing asymmetry of the lower face.

The patient had a significant medical history of a total thyroidectomy performed 10 years prior (2013). The histopathology at that time confirmed adenocarcinoma papillary thyroidea variant folliculare. Family and psychosocial histories were non-contributory.

Plain radiographs and a head CT scan revealed a mass in the right mandible with an extensive osteolytic lesion reaching the mandibular cortex (Figure 2). Neck ultrasound showed no residual thyroid tissue (post-operative state) but identified enlarged cervical lymph nodes. An intraoral incisional biopsy was performed, and histopathology confirmed metastatic papillary thyroid carcinoma.

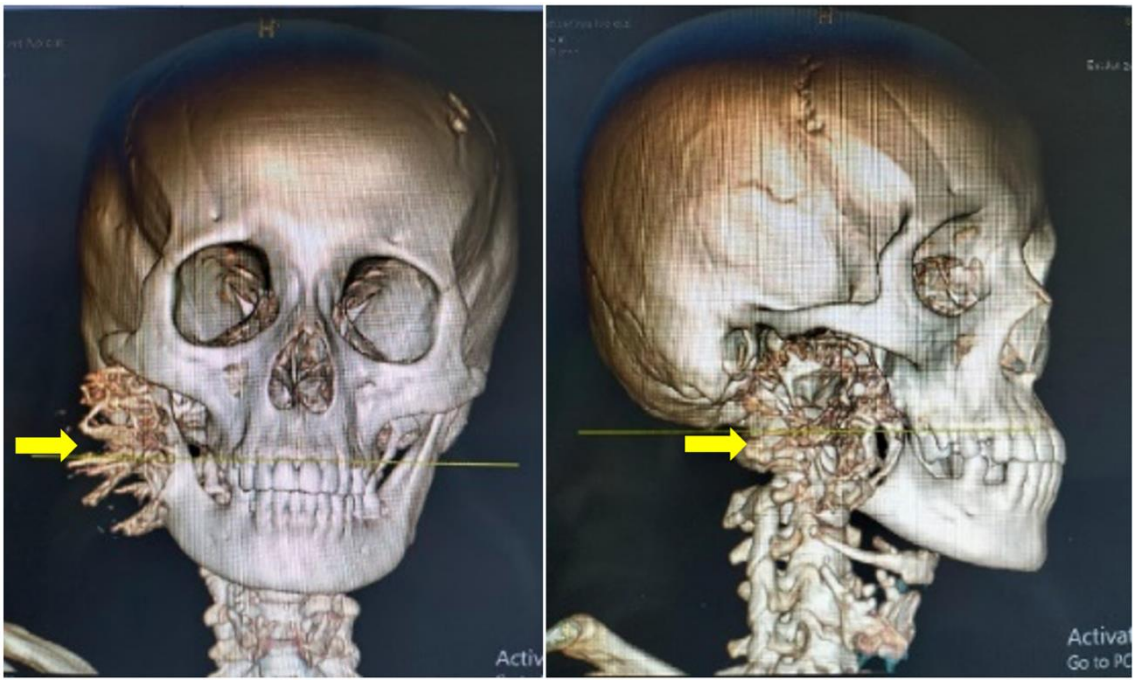

Figure 2. Head CT scan showing an osteolytic tumor involving the right mandibular body and angle with thinning and disruption of the cortical bone.

The patient underwent a right hemimandibulectomy to achieve complete tumor excision. The resultant bone defect was immediately reconstructed using a titanium reconstructive plate to ensure post-operative function and stability (Figure 3). Examination of the resection specimen confirmed submandibular papillary thyroid carcinoma. The tumor cells exhibited a papillary pattern with clear fibrovascular stalks, infiltrative growth, and nuclear features typical of PTC, including ground-glass opacity and grooving (Figure 4).

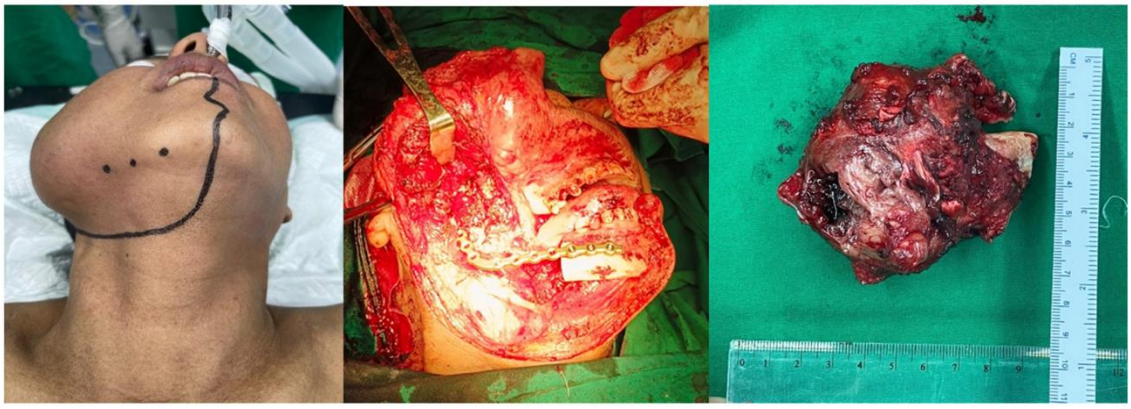

Figure 3. Intraoperative photograph of Case 1 showing a 7 × 8 cm tumor involving the right mandibular body and angle.

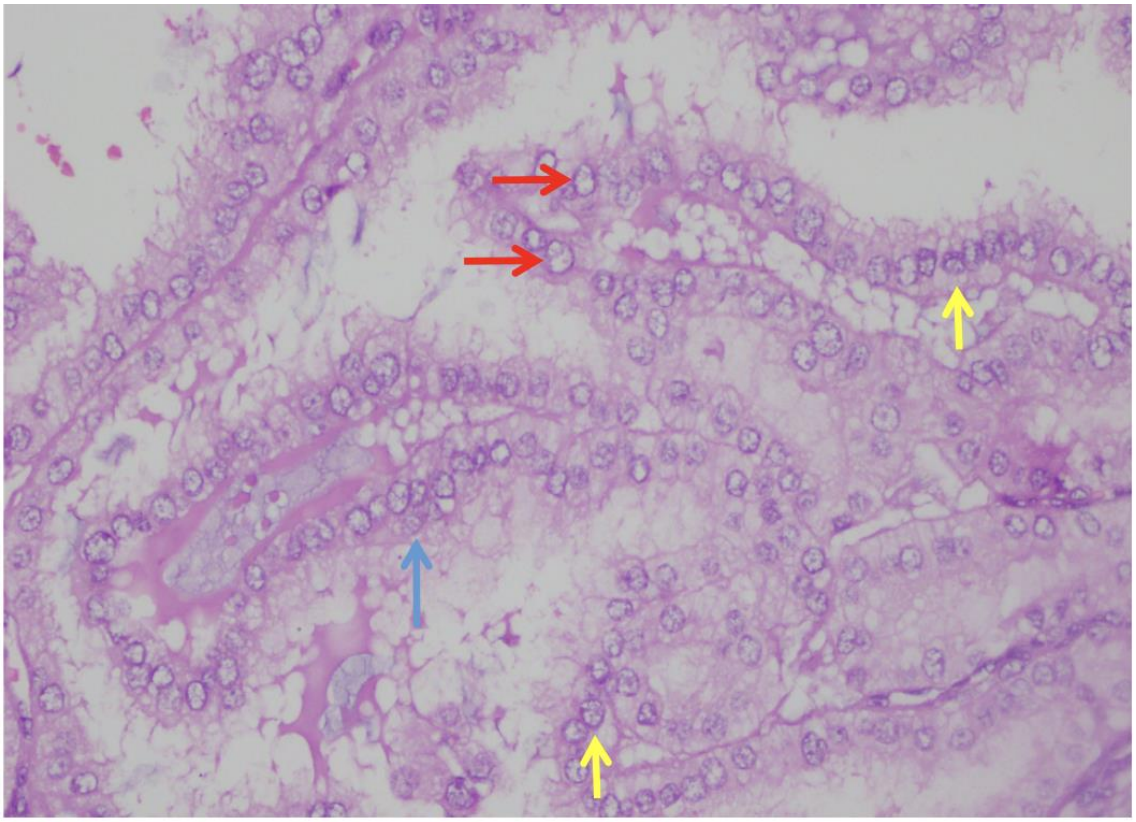

Figure 4. Histopathologic section of the mandibular lesion (H&E stain) showing malignant nests of thyroid epithelial cells surrounded by a fibrous tissue capsule. The tumor forms papillary structures with clear fibrovascular stalks (red arrows) and exhibits infiltrative growth into the fibrous capsule and adjacent skeletal muscle. Tumor cells display round to oval atypical pleomorphic nuclei with nuclear crowding and overlapping

(blue arrow), a ground-glass appearance and nuclear grooves (yellow arrow), with low mitotic activity (0–1 mitoses per high-power field). Hemorrhagic areas are observed at the periphery of the lesion.

2.2 Case 2

A 51-year-old Asian female presented with a mass on the left mandible that had been present for two years, accompanied by intermittent pain (Figure 5). The mass was hard, approximately the size of a tennis ball, and caused difficulty in opening the mouth.

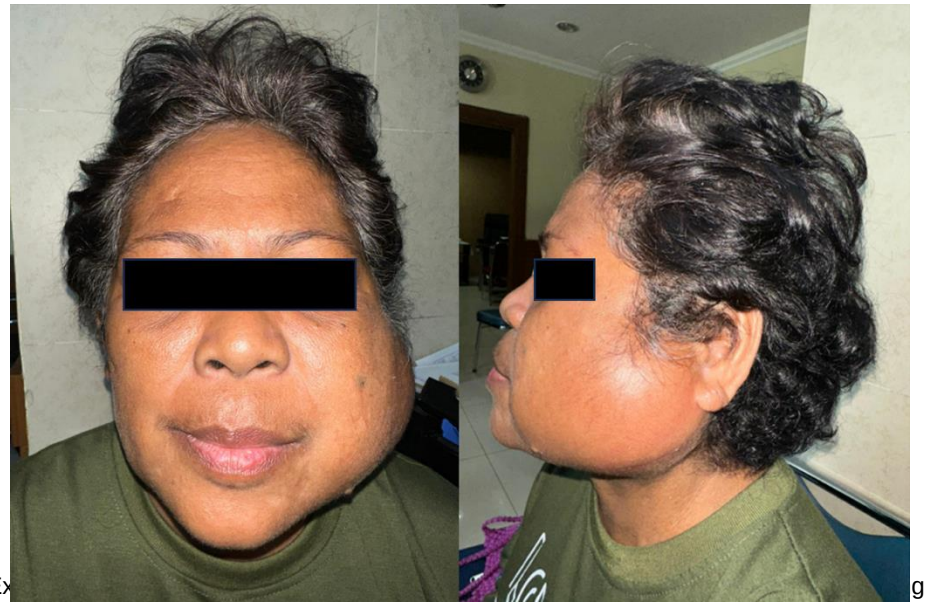

Figure 5. Ex g the left mandibular body and angle, causing asymmetry of the lower face.

Unlike Case 1, this patient had no history of an anterior neck lump or thyroid disease. She had a history of traditional massage therapy on the mandibular area. There were no signs of hyperthyroidism such as palpitations, agitation, or weight loss. Family and psychosocial histories were non-contributory.

Head and face CT scans demonstrated a lytic lesion on the left mandible (Figure 6); however, a neck ultrasound revealed no enlargement of the thyroid gland. An intraoral incisional biopsy suggested a follicular variant of papillary carcinoma of thyroid origin.

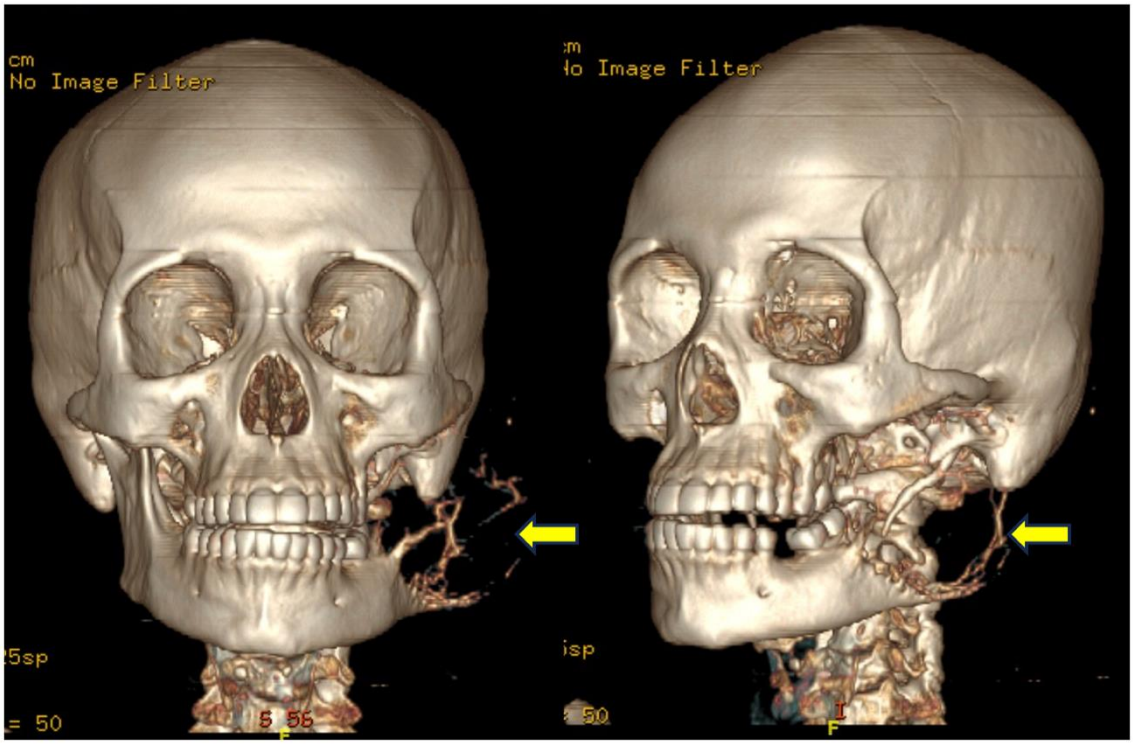

Figure 6. Axial head CT scan of Case 2 demonstrating an expansile osteolytic lesion of the left mandible with cortical thinning and destruction.

The patient underwent a left hemimandibulectomy, followed by reconstruction of the mandibular defect with a titanium reconstructive plate (Figure 7). The final histopathology confirmed follicular variant papillary thyroid carcinoma. The tissue showed papillary structures with fibrovascular stalks, ground-glass nuclei, and psammoma bodies, without lymphovascular space invasion (Figure 8).

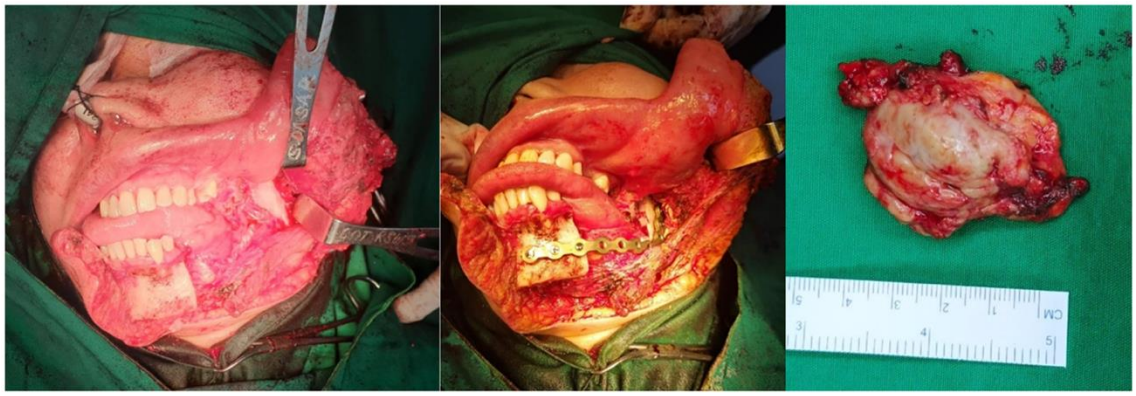

Figure 7. Intraoperative photograph of Case 2 demonstrating a 4 × 5 cm mass involving the left mandibular body and angle.

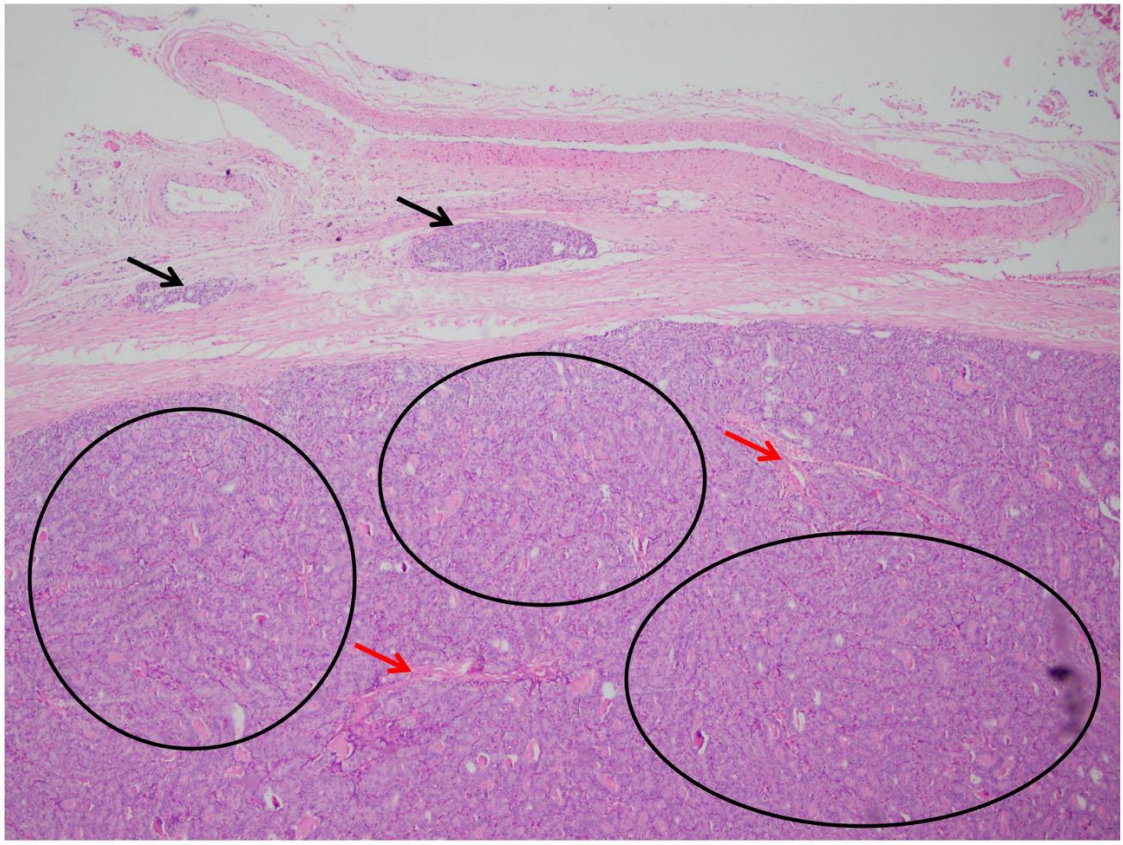

Figure 8. Histopathologic image of the mandibular lesion (H&E stain) showing papillary tumor cell nests (black circle) with well-formed fibrovascular stalks (red arrows). The neoplastic cells are of thyroid epithelial origin and are lined by epithelium with round atypical pleomorphic nuclei and prominent nucleoli, displaying characteristic nuclear features of papillary thyroid carcinoma, including a ground-glass appearance and nuclear grooves, with focal nuclear crowding and infiltrative growth into the surrounding fibrous capsule (black arrow). Small areas of microfollicular and macrofollicular architecture containing colloid are also observed.

3. DISCUSSION

Thyroid carcinoma is the most common endocrine malignancy, with incidence rates rising annually.[7,8] In Indonesia, it ranks ninth among all cancers based on pathological registration data. Data from Dharmais Hospital-Jakarta indicates that 83% of thyroid carcinomas are PTC.[9] The diagnosis of thyroid nodules typically involves anamnesis and physical examination followed by sonography, cytological assessment, and risk factor evaluation.[10] Thyroid cancer is classified into differentiated carcinoma (papillary and follicular), undifferentiated anaplastic carcinoma, and medullary carcinoma.[5] PTC is the most frequently encountered subtype, representing 80-85% of all thyroid malignancies.[11] It is most commonly diagnosed between the ages of 30 and 50 and is 2-4 times more frequent in females than males.[5,11] Microscopically, it is characterized by "ground glass" nuclei with hypodense chromatin.[11]

The metastasis of PTC typically involves regional lymph nodes, found in over 50% of cases at presentation.[5,11] Infiltration into central lymph nodes generally does not worsen the prognosis, especially in patients under 55 years of age.[11] However, classical PTC rarely invades the venous system.[4] Distant metastasis usually occurs after long-

term follow-up (>10 years) and is seen in only 5-7% of patients, with bone metastasis occurring in approximately 4%. Distant metastasis at the initial diagnosis is very rare.[5]

Metastasis to the bone involves a multistep process including loss of cell adhesion, invasion, and dissemination via blood or lymphatics.[12] The bone microenvironment, containing osteoclasts and osteoblasts, can be exploited by tumor cells to promote metastasis. Differentiated thyroid carcinoma (DTC) metastases are typically osteolytic. Tumor cells may secrete factors like PTHrP and interleukins (IL-6, IL-8, IL-11) to stimulate RANKL release by osteoblasts, driving osteoclastogenesis and bone destruction.[12–14] The mandible and gingiva are favored sites for oral metastasis due to the rich vascular circulation in the medullary cavity of the corpus and angulus regions.[12,15]

In the cases reported here, distinct clinical presentations were observed. The first case involved a delayed recurrence where the patient presented with metastasis 10 years after a total thyroidectomy. The absence of ablation therapy or rigorous follow-up likely allowed microscopic residual tumor cells to metastasize slowly. Conversely, the second case highlighted an occult primary tumor where mandibular metastasis was the initial manifestation. The primary tumor was likely "occult" or a microcarcinoma (<1 cm), which is difficult to detect via standard ultrasound. Occult PTC is occasionally identified only after the appearance of distant metastasis.[16]

While the exact incidence of mandibular metastasis is unknown, these lesions account for 1% of all oral malignancies, with the mandible being a more common site than the maxilla.[17] Symptoms of mandibular metastasis include pain, swelling, tooth loss, paresthesia, and rarely pathological fractures; sometimes these are the only signs of disseminated malignancy.[18]

Regarding management, surgery is indicated for isolated, solitary, and accessible metastases. Comprehensive management often requires a combination of surgery (including total thyroidectomy if not previously performed), radioactive iodine (RAI), and external radiation to improve outcomes.[15] While the free fibula flap is often considered the gold standard for reconstruction, both patients in this series were successfully managed with hemimandibulectomy and titanium plate reconstruction. The prognosis for patients with distant metastasis is generally poor, with a 10-year survival rate of 52.9%.[19] However, PTC is generally indolent, and many patients survive for long periods even with metastatic disease. Prognosis depends on age at diagnosis, tumor burden, and the number of skeletal metastases.[5,20,21]

4. CONCLUSION

Mandibular metastasis from FV-PTC is a rare clinical entity that can present either as a late recurrence or as the primary sign of an occult thyroid malignancy. Surgical reconstruction aiming for stability and function is crucial for improving quality of life. Clinicians must maintain a high index of suspicion for metastatic thyroid carcinoma in patients presenting with lytic mandibular lesions, even in the absence of a palpable thyroid mass.

ETHICAL APPROVAL

This case series is exempt from ethical approval from the ethical local board of the Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.

CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

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None

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Conflict of Interest Statement:

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.