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Original Research Article

Oncocytic Variant of Papillary Thyroid Carcinoma Presenting as a Massive Cystic Neck Mass: An Interesting Case Report

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Abstract:

Cystic neck masses in adults are frequently presumed to be benign, most commonly attributed to abscesses, lymphatic malformations, or congenital cysts. However, malignant aetiologies, particularly metastatic papillary thyroid carcinoma (PTC) can occasionally masquerade as benign cystic lesions and delay diagnosis. We report the case of a 34-year-old male with an unusually large cystic neck mass, initially interpreted radiologically as benign, that was ultimately diagnosed as oncocytic variant PTC with tall-cell morphology and metastatic nodal involvement. Through this case, we highlight the diagnostic pitfalls of cystic neck lesions in adults, the prognostic implications of aggressive histologic variants of PTC, and the need for heightened suspicion in atypical cystic presentations. Awareness of this clinical pattern is crucial for early recognition and optimal multidisciplinary management.

Keywords: Thyroid Carcinoma; Oncocytic Variant; Massive Cystic Neck Mass.

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Introduction

Cystic neck masses commonly lead clinicians to consider benign aetiologies such as branchial cleft cysts, abscesses, lymphangiomas, and vascular malformations. While this is an appropriate initial approach in paediatric cases, in adults a lateral cystic neck mass warrants careful evaluation for malignancy. Increasing literature asserts that metastatic papillary thyroid carcinoma is a significant cause of persistent or atypical cystic cervical lesions in adults, even in the absence of palpable thyroid nodules or thyroid-specific symptoms [1,2].

Papillary thyroid cancer (PTC) typically presents as a solid thyroid nodule; however, metastatic lymph nodes from PTC may undergo cystic degeneration, simulating an inflammatory or congenital lesion on imaging. This atypical presentation can lead to misdiagnosis or delays in management, particularly when the thyroid gland appears clinically normal [3]. Fine-needle aspiration cytology (FNAC), although central to the evaluation of neck masses, has markedly reduced sensitivity in cystic lesions because of hypocellularity and dilutional artifacts [4].

The oncocytic (Hürthle-cell) variant of PTC is uncommon and may exhibit more aggressive biological behaviour, including extrathyroidal spread and nodal metastasis [5,6]. Tall-cell morphology, even when comprising a small fraction of tumour cells, has been associated with more aggressive clinical outcomes [7]. This case underscores the need for heightened diagnostic suspicion in cystic neck masses in adults and reinforces the prognostic significance of histologic variants in PTC.

Case Presentation: A 34-year-old male presented with a progressively enlarging swelling on the left side of the neck. The swelling was initially noticed 14 years earlier as a small, asymptomatic lump but had rapidly increased in size over the preceding four months with intermittent purulent and blood-stained discharge from the overlying skin. An episode of high-grade fever three days prior had subsided with antipyretics. There were no associated symptoms such as dysphagia, dyspnoea, change in voice, weight loss, night sweats, fatigue, or signs of hyper- or hypothyroidism. He reported no prior radiation exposure or family history of thyroid disease.

Examination revealed a massive cystic swelling measuring approximately 15 × 15 × 9 cm in the left submandibular region, extending inferiorly toward the upper thorax. The swelling was soft and fluctuant, with mild tenderness, local warmth, erythema, a pus point, and an overlying 2 × 2 cm area of skin necrosis (FIG 1). Transillumination was negative. No cervical lymphadenopathy was appreciated.

Ultrasound demonstrated a well-defined, heterogeneous predominantly liquefied collection (~4000 cc) with dense internal debris. Contrast-enhanced CT revealed an 18 × 21 × 19 cm peripherally enhancing cystic lesion in the left anterolateral neck, displacing the larynx, trachea, and left common carotid artery to the right, and extending to the thoracic inlet (FIG 2). Mild supraglottic airway narrowing (8.3 mm) was noted. Laboratory investigations were within normal limits.

Table 1: Laboratory investigations

Investigation	Parameter	Value	Reference Value	Units
Complete Blood Count	Hemoglobin	14.2	13–17	g/dL
	TLC	7000	4,000–11,000	cells/µL
	Neutrophils	70	40–75	%
	Lymphocytes	22	20–45	%
	Eosinophils	4	1–6	%
	Monocytes	31	2–10	%
	Basophils	1	0–1	%
	Platelets	3,25,000	150,000–450,000	/µL
	PCV	50	40–52	%
	RBC count	5.1	4.5–5.9	million/µL
Blood Sugar	Fasting blood sugar	88	70–100	mg/dL
	Random blood sugar	101	70–140	mg/dL
	HbA1c	5.5	<5.7	%
Renal Function Test	Blood urea	24	15–40	mg/dL
	Serum creatinine	1.0	0.6–1.3	mg/dL
Electrolytes	Sodium	135	135–145	mmol/L
	Potassium	3.8	3.5–5.0	mmol/L
	Chloride	100	98–106	mmol/L
	Bicarbonate	24	22–28	mmol/L
Liver Function Test	Total bilirubin	1.1	0.2–1.2	mg/dL
	Direct bilirubin	0.1	0–0.3	mg/dL
	AST/SGOT	30	5–40	U/L
	ALT/SGPT	32	5–45	U/L
	ALP	76	40–130	U/L
	Total protein	6.2	6–8	g/dL
	Albumin	4.5	3.5–5.0	g/dL
Coagulation Profile	PT	13	11–14	sec
	INR	1.13	0.8–1.2	—
	aPTT	28	25–35	sec
Urine Routine	pH	6.8	4.5–8	—
	Specific gravity	1.010	1.005–1.030	—
	Protein	Negative	-	—
	Glucose	Negative	-	—
	Pus cells	1	0–5	/HPF
	RBC	0	0–2	/HPF
Blood Grouping	ABO/Rh	AB +	A/B/AB/O Rh ±	—
Infectious Screening	HIV	Non-reactive	Non-reactive	—
	HBsAg	Non-reactive	Non-reactive	—
	Anti-HCV	Non-reactive	Non-reactive	—

Surgical excision was undertaken through an incision below the mandibular angle extending to the posterior border of the right sternocleidomastoid muscle. After elevation of subplatysmal flaps and further vertical extension for exposure, the lesion was dissected free from the clavicle inferiorly, the left mandibular body superiorly, the anterior tracheal wall, the carotid sheath (with preservation of the vagus nerve), the left posterior triangle, and the prevertebral space (Figure 3). Due to dense

adherence of the left thyroid lobe and isthmus to the lesion, a left hemithyroidectomy was performed, and the cystic mass was removed en bloc. And this excised mass weight was 3.8 Kgs.

Histopathological examination revealed oncocytic variant PTC with 10% tall-cell morphology. Nuclear clearing, grooves, and overlapping characteristic of PTC were noted (Figure 4). Adjacent soft-tissue involvement was present, although resection margins and overlying skin were tumour-free. One lymph node specimen showed metastatic PTC (largest metastasis 6 cm) without extranodal extension.

Whole-body FDG-PET/CT showed a metabolically active lesion in the right thyroid lobe and metastatic nodes in bilateral levels II, III and IV (Figure 5). Completion thyroidectomy with bilateral level II–IV dissections and left level Ib clearance was performed within one month. Final histology demonstrated metastatic PTC in right level III and IV nodes with extranodal extension. Based on American Thyroid Association (ATA) 2015 intermediate-risk criteria, the patient underwent radioiodine ablation. [8]

Images

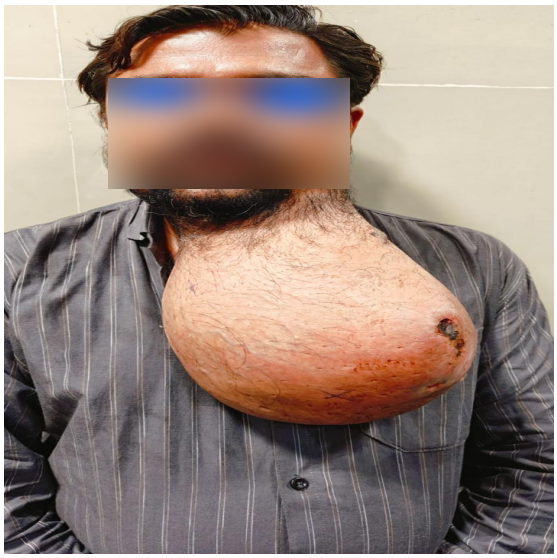

Figure 1: Clinical image showing a massive cystic swelling measuring approximately 15 × 15 × 9 cm in the left submandibular region, extending inferiorly toward the upper thorax

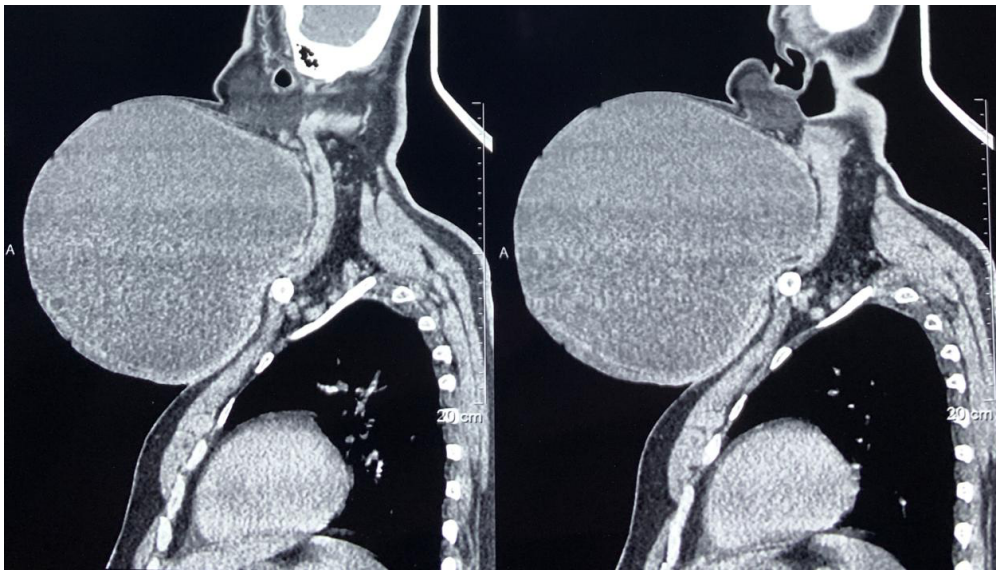

Figure 2: Radiological image: Contrast enhanced CT scan showing an 18 × 21 × 19 cm peripherally enhancing cystic lesion in the left anterolateral neck, displacing the larynx, trachea, and left common carotid artery to the right, and extending to the thoracic inlet, with mild supraglottic airway narrowing (8.3 mm).

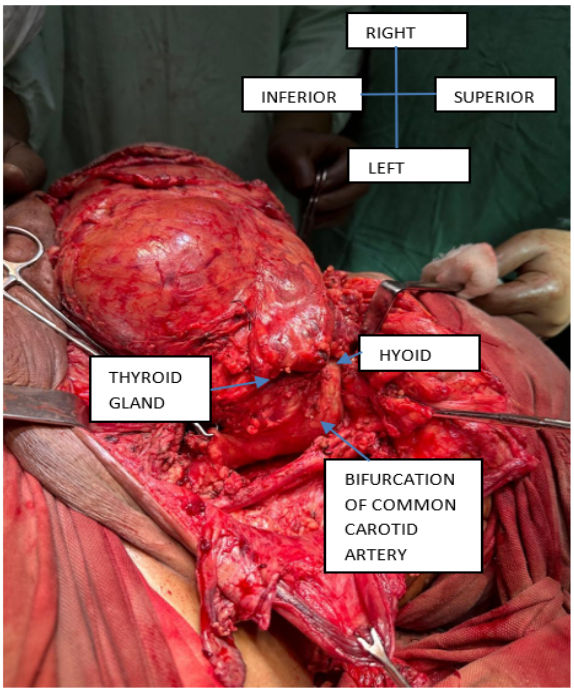

Figure 3: Intra-operative images

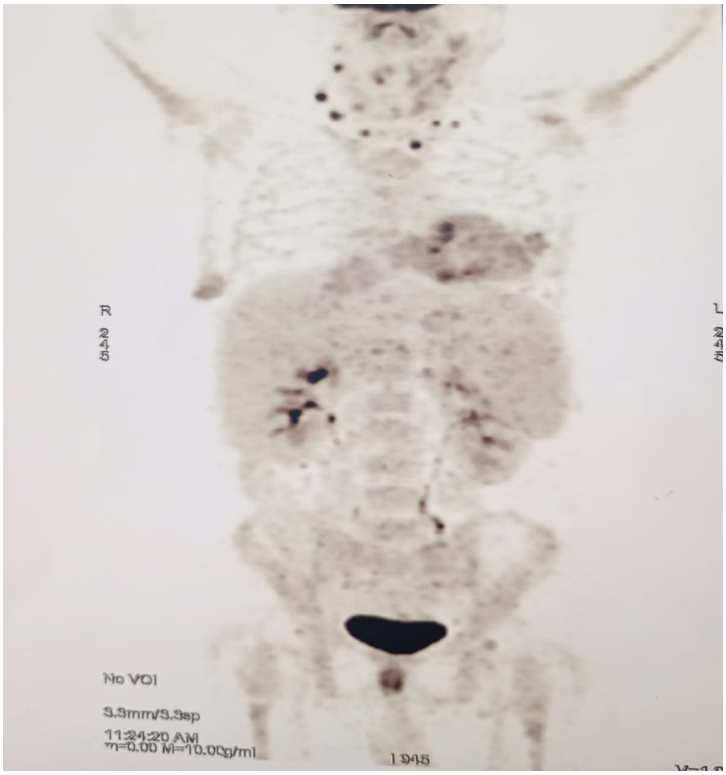

Figure 4: Whole-body FDG-PET/CT showed a metabolically active lesion in the right thyroid lobe and metastatic nodes in bilateral levels II, III and IV

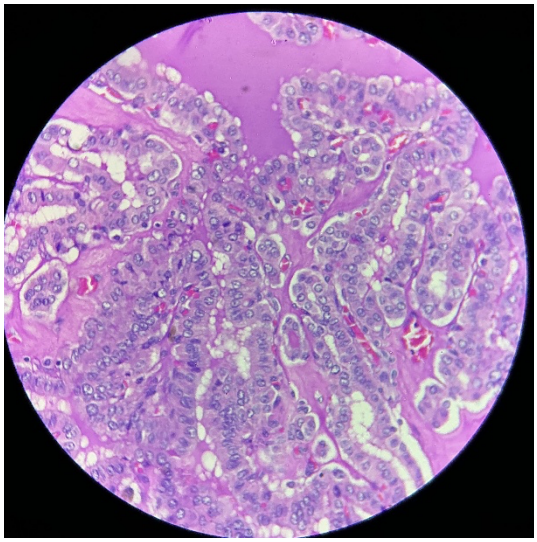

Figure 5: Orphan Annie eye nuclei in tall cell variant of papillary carcinoma. (H&E stained, high power 60× magnification)

Discussion

This case illustrates the diagnostic difficulty of cystic neck masses in adults and highlights critical learning points regarding metastatic PTC and its aggressive histologic variants.

Cystic neck masses and malignant masquerade: Benign aetiologies are common differentials; however, literature strongly advocates considering metastatic malignancy in adults with lateral cystic cervical masses. Al-Ashaa et al. reported that PTC may present solely as a lateral cystic mass in the neck with an otherwise clinically silent thyroid [1]. Similar findings were reported by Sheahan et al., who noted that metastatic cystic nodes from PTC are frequently misdiagnosed as branchial cleft cysts or abscesses [2].

Mechanism of cystic change in metastatic lymph nodes: Cystic degeneration is believed to result from necrosis within metastatic lymph nodes and secretion of thyroglobulin-rich fluid by malignant thyroid epithelium [3]. Thick, haemorrhagic, and debris-rich fluid is characteristic, as seen in this case.

FNAC limitations in cystic metastases: FNAC has decreased diagnostic sensitivity in cystic metastases, reported at 33–55% compared with 85–95% in solid thyroid malignancy [4]. Hypocellularity, macrophage predominance, and dilutional fluid contribute to false-negative results [5]. Hence, recurrent nondiagnostic FNAC should prompt excision biopsy or surgical exploration.

Oncocytic variant and tall-cell morphology: prognostic significance

The oncocytic variant of PTC, originally described by Carcangiu et al., has been associated with higher recurrence rates and locoregional spread [6]. Tall-cell morphology (>10% of tumour cells), even when focal, increases the risk of nodal metastasis, distant spread, and disease-specific mortality [9]. The coexistence of oncocytic differentiation and tall-cell morphology may synergistically amplify the aggressiveness of disease, warranting comprehensive management.

Management and follow-up: ATA guidelines recommend completion thyroidectomy and radioiodine therapy in patients with aggressive histologic variants, metastatic nodes >3 cm, or extranodal extension — all of which applied to this patient [8]. Long-term follow-up includes:

- Serum thyroglobulin and anti-Tg antibodies
- Neck ultrasound
- Consideration of diagnostic whole-body scan
- TSH suppression therapy given recurrence risk

A meta-analysis by Vuong et al. reported recurrence rates of 19–28% in tall-cell and oncocytic subtypes versus 8–12% in classical PTC, reinforcing the need for long-term surveillance [10].

Unusually prolonged clinical course and giant tumour burden: One of the most remarkable aspects of this case is the exceptionally long duration of the neck swelling. The patient first noticed a small cervical mass approximately 14 years before presentation and remained largely asymptomatic for most of this period. Papillary thyroid carcinoma is generally characterized by slow growth and indolent biological behaviour; however, progression to a giant cystic metastatic deposit measuring over 20 cm and weighing 3.8 kg is exceedingly uncommon. The rapid enlargement observed during the preceding four months may represent secondary infection, intralesional haemorrhage, accelerated cystic degeneration, or progression related to aggressive histological characteristics. Previous studies have demonstrated that tall-cell differentiation and aggressive histological subtypes are associated with

accelerated tumour progression, increased locoregional invasion, and poorer clinical outcomes [11].

Size of metastatic lesion and rarity in the literature: Most cervical cystic metastases arising from papillary thyroid carcinoma measure less than 5 cm at diagnosis. Giant cystic metastatic deposits exceeding 10 cm are rarely reported, and lesions larger than 15 cm are exceptional in contemporary literature [12]. In the present case, radiological dimensions of approximately 18 × 21 × 19 cm with an estimated fluid content approaching 4 litres place this lesion among the largest reported cystic metastatic manifestations of papillary thyroid carcinoma.

Despite significant displacement of the larynx, trachea, and carotid sheath structures, the patient did not experience dysphagia, airway compromise, dysphonia, or clinically evident thyroid dysfunction. This remarkable clinicoradiological dissociation demonstrates how slowly enlarging cervical masses can attain extraordinary dimensions while remaining relatively asymptomatic [12].

Diagnostic implications for adult cystic neck masses: Recent head and neck oncology literature increasingly supports the concept that all unexplained lateral cystic neck masses in adults should undergo evaluation for occult malignancy [13]. Although branchial cleft cysts remain important differential diagnoses, a substantial proportion of presumed branchial cysts in adults are subsequently identified as metastatic lesions, particularly from papillary thyroid carcinoma and human papillomavirus-associated oropharyngeal squamous cell carcinoma [13].

This case reinforces the importance of maintaining a high index of suspicion. The predominantly cystic appearance and inflammatory features could easily have led to a diagnosis of an infected branchial cyst or chronic abscess. Thorough radiological assessment of the thyroid gland and cervical lymphatic chains should therefore be incorporated into the routine evaluation of adult cystic neck masses [14].

Surgical considerations in giant cystic cervical metastases: Surgical excision of giant cervical lesions presents unique technical challenges. In this patient, the lesion extended from the submandibular region to the thoracic inlet and displaced major neurovascular and aerodigestive structures. Such anatomical distortion increases the risk of injury to the Vagus nerve, recurrent laryngeal nerve, carotid artery, internal jugular vein, and thoracic duct during dissection.

Complete resection required extensive extracapsular dissection and ultimately necessitated hemithyroidectomy because of dense adherence between the lesion and the thyroid gland. Successful preservation of major neurovascular structures despite extensive disease burden highlights the importance of meticulous surgical planning and careful intraoperative identification of anatomical landmarks. Similar technical difficulties have been reported in previously published cases of giant cystic cervical metastases from occult papillary thyroid carcinoma [15].

Significance of PET-CT findings: An important feature of this case was the identification of residual occult disease on postoperative FDG-PET/CT. Although the primary surgery successfully removed the dominant cervical mass, PET imaging demonstrated metabolically active disease within the contralateral thyroid lobe and additional cervical nodal metastases. These findings altered subsequent management and prompted completion thyroidectomy with comprehensive bilateral neck dissection.

The value of FDG-PET in identifying residual, recurrent, and metastatic differentiated thyroid carcinoma has been well documented, particularly in patients with aggressive disease characteristics or occult metastatic deposits not readily appreciated on conventional imaging [16]. In the present case, PET-CT contributed significantly to accurate disease staging and subsequent treatment planning.

Histopathological heterogeneity and tumour aggressiveness: Histopathological heterogeneity remains an important determinant of prognosis in papillary thyroid carcinoma. Studies evaluating aggressive histological variants have demonstrated increased rates of extrathyroidal extension, lymph node metastasis, recurrence, and disease-specific mortality compared with conventional papillary thyroid carcinoma [17].

The extensive nodal disease burden, soft-tissue involvement, and extranodal extension identified in this patient are consistent with these observations. Emerging evidence further suggests that even focal tall-cell differentiation may adversely affect prognosis and should therefore be recognized and reported by pathologists, as it may influence risk stratification and postoperative management decisions [18].

Conclusions

Cystic neck masses in adults should not be assumed to be benign until metastatic disease is excluded. This case demonstrates that metastatic PTC may present with deceptively benign radiologic characteristics and emphasizes the importance of comprehensive evaluation. Recognition of aggressive histologic variants such as the oncocytic and tall-cell forms is crucial for accurate prognostication and tailoring of treatment and surveillance strategies.

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