



# Metastatic papillary thyroid carcinoma masquerading as a giant cell tumor

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## ABSTRACT

Multinucleated giant cells (MNGC) are found in benign and malignant lesions of the head and neck. We report a case of recurrent metastatic papillary thyroid cancer (PTC) with an unusual presentation as a giant cell-rich mass. The patient underwent multiple resections of a tracheal mass with pathology consistent with MNGC tumor. Further work up revealed FDG-avidity in the paratracheal area, suspicious for thyroid malignancy. Biopsy and subsequent targeted staining revealed and confirmed the mass as BRAFV600E-positive PTC. This is a case that presents the importance of high index of suspicion for PTC in this anatomic region even when pathology is not initially revealing, in this case consistent with giant cell tumor.

## CONTACT

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## INTRODUCTION

Multinucleated giant cells (MNGC) are found in benign and malignant lesions of the head and neck. We report a case of recurrent metastatic papillary thyroid cancer (PTC) with an unusual presentation as a giant cell-rich mass.

## BACKGROUND

### Giant cell tumor

- Giant cell tumor of soft tissue is morphologically identical to giant cell tumor of bone
- Tumor of low grade malignant potential, which is cured by complete surgical resection

### Papillary thyroid carcinoma

- BRAF is the most frequently mutated gene, occurring in 60% of cases. Most frequent mutation is BRAFV600E, which is associated with classic variant and tall cell variant, as well as a low thyroid differentiation score (i.e. less differentiated)
- BRAF is highly prevalent (80 - 90%) in PTC from coastal Asian countries with high iodine intake (Japan, Korea)<sup>1</sup>
- Can also have **giant cells**

### Anaplastic thyroid carcinoma

- Three patterns (can be singly or in any combination):
  - Sarcomatoid (about 50%)
  - Giant cell (30 - 40%)<sup>2</sup>
  - Epithelial (< 20%)
- BRAF V600E in 20%
- Secondary change: acute inflammation, macrophages, **osteoclast-like multinucleated giant cells**
- May arise as anaplastic transformation of differentiated thyroid carcinoma (papillary, follicular or Hürthle cell carcinoma)

## CASE

An 85 year-old man presented with dyspnea and stridor. History was notable for thyroid cancer managed 8 years ago in China with thyroidectomy and Cyberknife. CT showed a left tracheal mass extending to the thyroid bed (Figure 1).

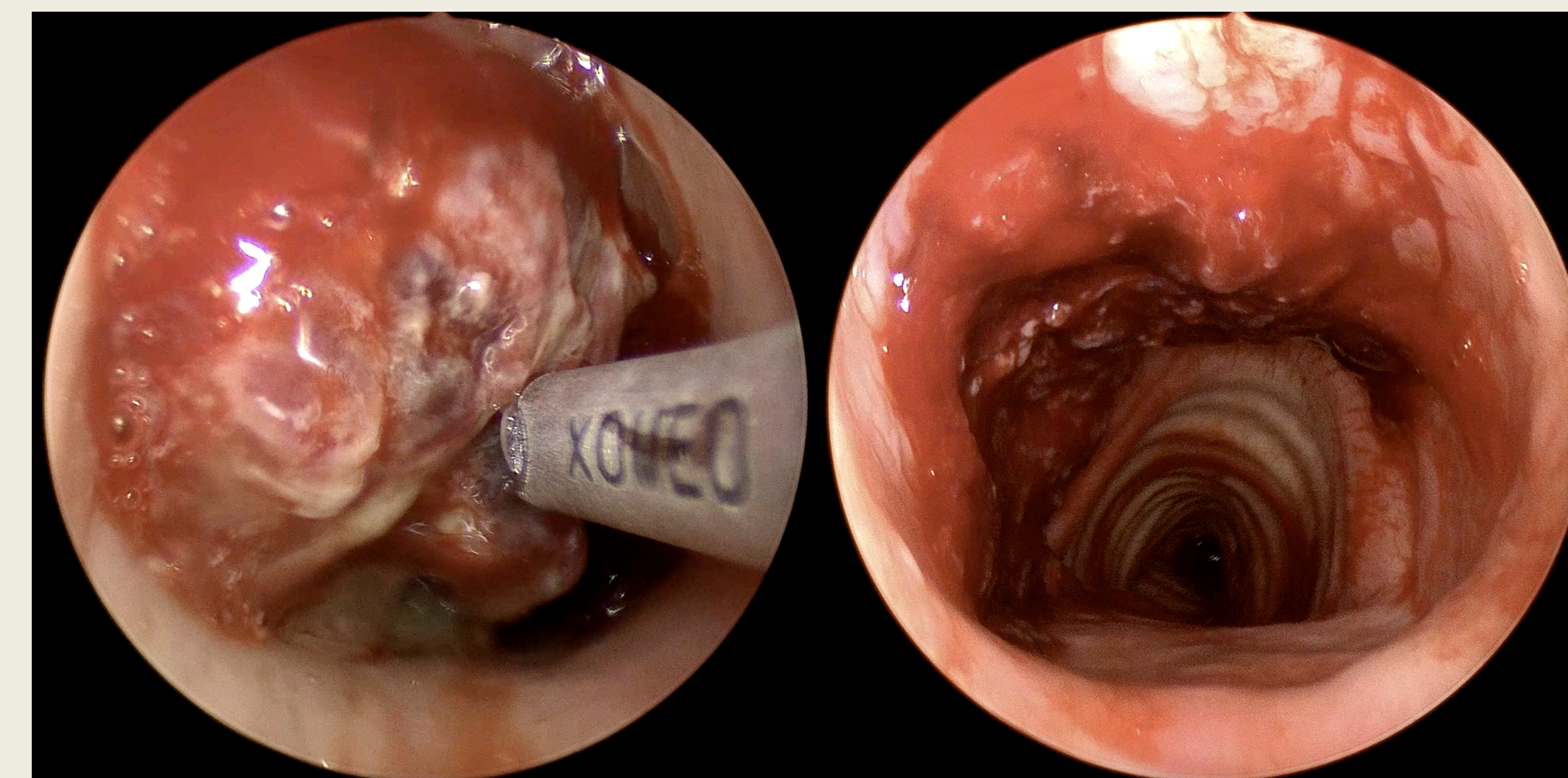


**Figure 1.** CT neck with IV contrast. Left: axial cut showing tracheal mass. Right top: coronal cut. Right bottom: sagittal cut.

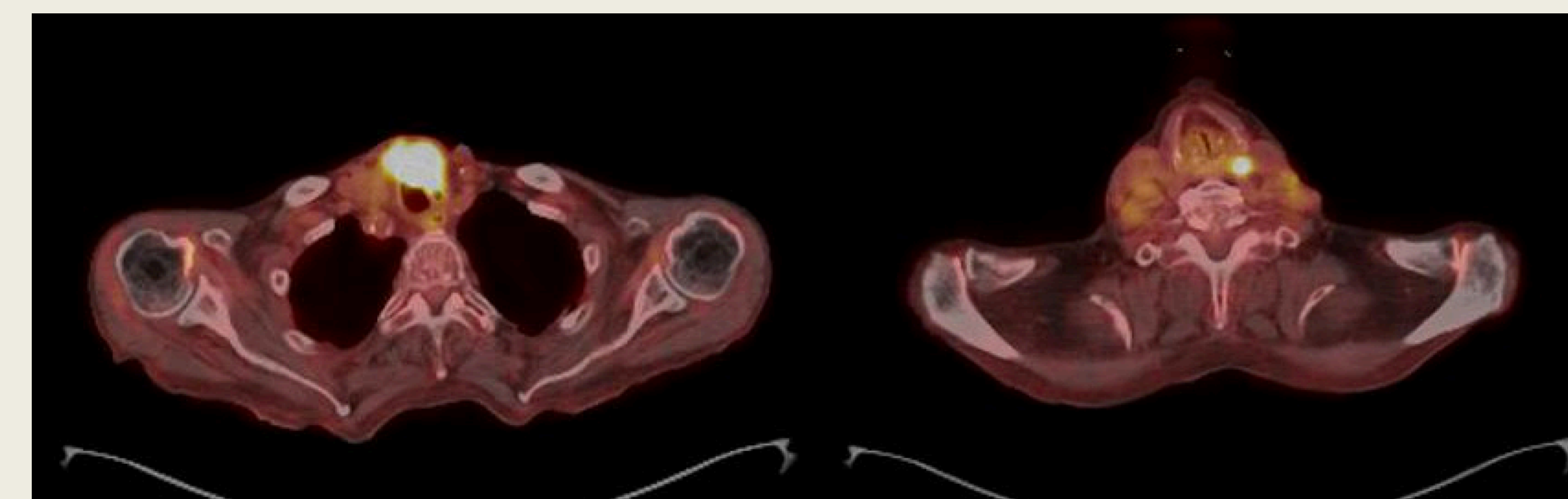
## MANAGEMENT

The patient was taken to the OR for direct laryngoscopy, bronchoscopy, biopsy and excision of the subglottic mass. The mass obstructed approximately 80% of the tracheal lumen and was pedicled at the 1 o'clock position. Discharge plans were made for PET CT and close follow up. Pathology showed multinucleated giant cell tumor, negative for markers of thyroid follicular cells, thought to represent a **giant cell tumor of soft tissue**.

The patient was lost to follow up and returned 8 weeks later with dyspnea, found to have regrowth of the mass, which was resected (Figure 2) and pathology again showed MNGC. PET CT revealed an FDG-avid tracheal mass, bilateral cervical nodes, and likely distant metastases with FDG avid pulmonary nodules and right gluteal soft tissue nodule (Figure 3). The patient then underwent elective tracheostomy and core biopsy of a level V lymph node and pretracheal nodule.

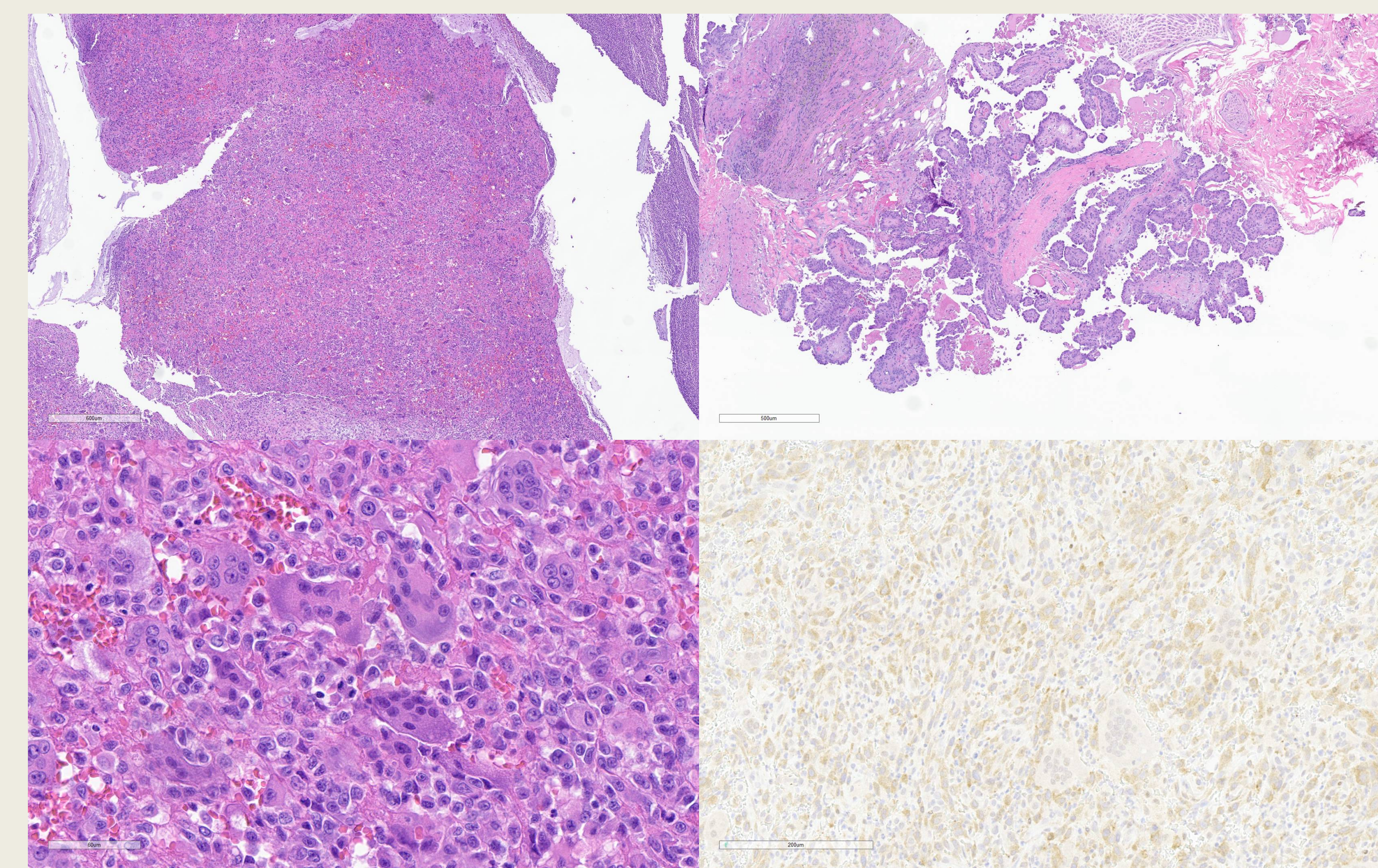


**Figure 2.** Left: tracheal mass obstructing the tracheal lumen. Right: appearance of airway after surgical debulking



**Figure 3.** Left: axial fused PET-CT showing FDG-avid tracheal mass. Right: axial fused PET-CT of the neck with avid paratracheal node. Distant metastases not shown.

Surgical pathology again showed multinucleated giant cell tumor but further immunohistochemistry analysis was consistent with BRAFV600E-positive PTC (Figure 4). Genetic tests on tracheal tissue showed mutations matching the biopsies. This presentation was consistent with metastatic, BRAFV600E-positive PTC with possible anaplastic transformation.



**Figure 4.** Top left: tracheal mass (4x). Top right: well-differentiated component (4x). Bottom left: tracheal mass (40x). Bottom right: BRAF immunostain.

## CONCLUSION

Giant cell tumor of soft tissue is a rare entity in the neck. The differential for MNGC-containing lesions should include PTC, anaplastic thyroid carcinoma, Langerhan histiocytosis, and thyroiditis. Patient history, genetic analysis, and biomarker immunohistochemistry help to guide a final diagnosis.

## REFERENCES

1. Bychkov A. Prevalence of BRAFV600E mutation in Asian patients with thyroid cancer. *Malays J Pathol.* 2017 Apr;39(1):95-96. PMID: 28413212.
2. Gaffey MJ, Lack EE, Christ ML, Weiss LM. Anaplastic thyroid carcinoma with osteoclast-like giant cells. A clinicopathologic, immunohistochemical, and ultrastructural study. *Am J Surg Pathol.* 1991 Feb;15(2):160-8. doi: 10.1097/0000478-199102000-00009. PMID: 1989464.