

Squamous cell carcinoma of the thyroid with lymph nodal and pulmonary metastases

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CASE SUMMARY

A 60-year-old female presented to the ENT department of our hospital with a complaint of progressive neck swelling of three months' duration and a shorter duration of dysphagia, neck pain, and mild breathing difficulty. Thyroid function test results were unremarkable. Ultrasound neck done elsewhere showed a large cystic lesion in the thyroid with no increased vascularity on color Doppler.

IMAGING FINDINGS

A CT scan of the neck revealed a large, well-defined, slightly lobulated soft-tissue heterogeneous mass arising from the right lobe, isthmus, and part of the left lobe of the thyroid gland with no micro- or macrocalcifications (Figure 1). The lesion was hypoenhancing, predominantly of low attenuation and well delineated from the peripheral normal enhancing residual thyroid parenchyma (Figures 2, 3). The mass was seen infiltrating the strap muscles and the sub-

cutaneous soft-tissue plane. Inferiorly, the lesion extended retrosternally into the superior mediastinum (Figures 4, 5). Also seen were multiple heterogeneously enhancing level II, III, and IV cervical lymph nodes (Figure 6), with the most significant measuring 3×3.7 cm on the left side.

A chest CT scan performed as part of additional workup revealed multiple subcentimetric, soft tissue, nodular densities scattered in bilateral lung fields (Figures 7, 8), with a few showing the feeding-vessel sign. Incidentally noted was cylindrical bronchiectasis with mucus plug impaction in the right middle lobe and lingular left upper lobe segment (Figure 9). No significant mediastinal lymphadenopathy was noted (Figure 10). A contrast-enhanced CT scan of the abdomen for metastasis was unremarkable. In our case, the patient showed progressive dyspnoea and dysphagia on follow-up. An FNAC of the thyroid lesion revealed squamous cell carcinoma.



FIGURE 1. CT neck topographic image reveals sizeable soft tissue opacity in the pretracheal region with no apparent calcification within. Upper airway column is patent.

DIAGNOSIS

Squamous cell carcinoma of thyroid with lymph nodal and pulmonary metastases

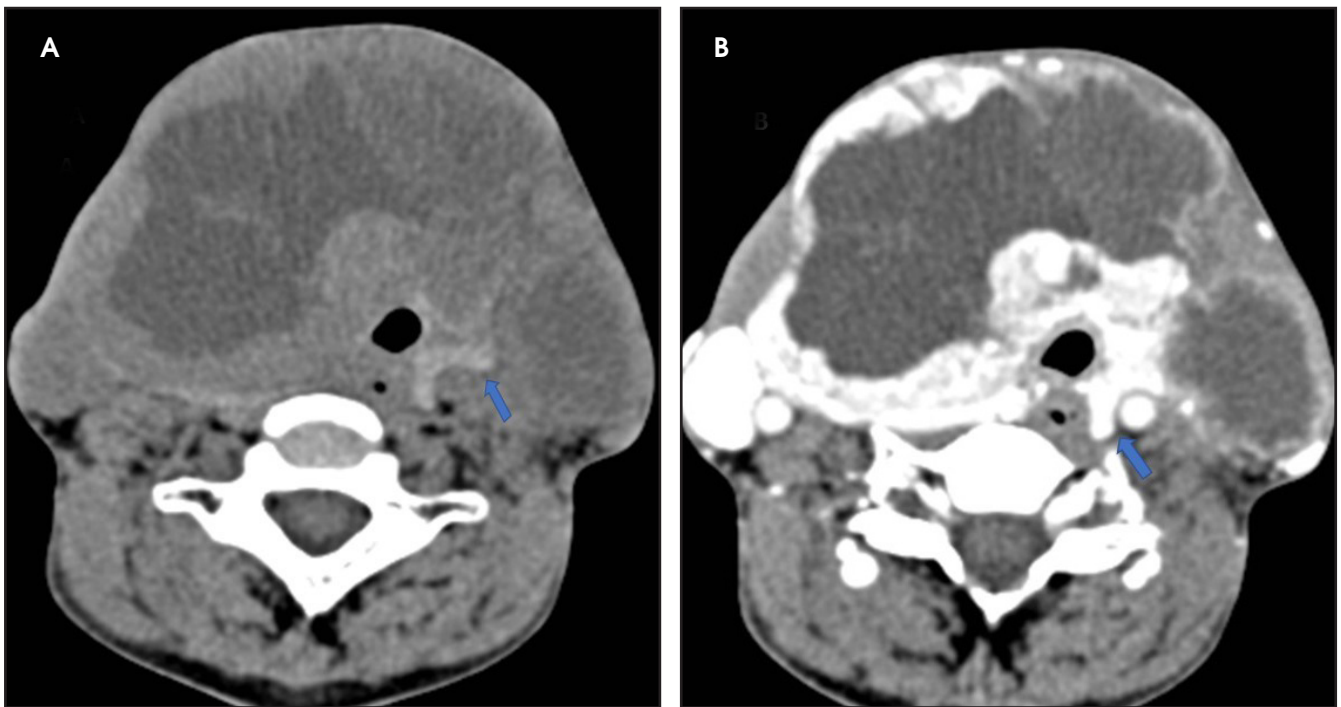


FIGURE 2. Plain (A) and postcontrast (B) axial images of CT neck at the level of thyroid showing predominantly cystic thyroid lesion. A significant part of the left lobe of the thyroid gland (arrows) is seen separate from the lesion.

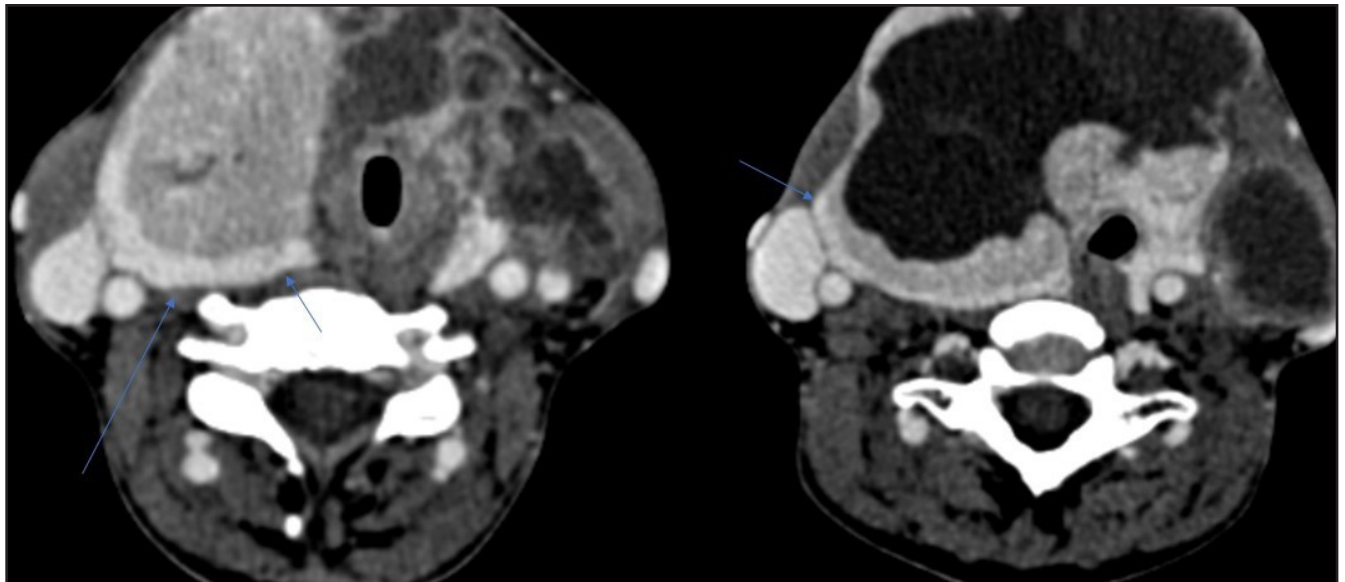


FIGURE 3. Axial CECT neck images reveal differential densities within the thyroid gland. Normal residual compressed right lobar thyroid parenchyma is seen peripherally (arrows).

DISCUSSION

Thyroid cancer is the most common endocrine malignancy and is the seventh-most common cancer in women. Typically, these malignancies arise from the normal thyroid tissues and

are of papillary, follicular, or medullary histology.¹ Primary squamous cell carcinoma (SCC) of the thyroid is a sporadic malignant disease because the thyroid lacks squamous cells. The disease is almost always fatal. Fewer

than 100 cases have been reported in the literature;² it represents <1% of all primary carcinomas of the thyroid gland.^{3,4} Overall survival usually does not exceed 6 months' post-diagnosis. In our case, there was progressive



FIGURE 4. Sagittal postcontrast images of CT neck show heterogeneously enhancing predominantly cystic thyroid lesion with retrosternal extension. Airway column is patent, though, partially compromised by the thyroid lesion.

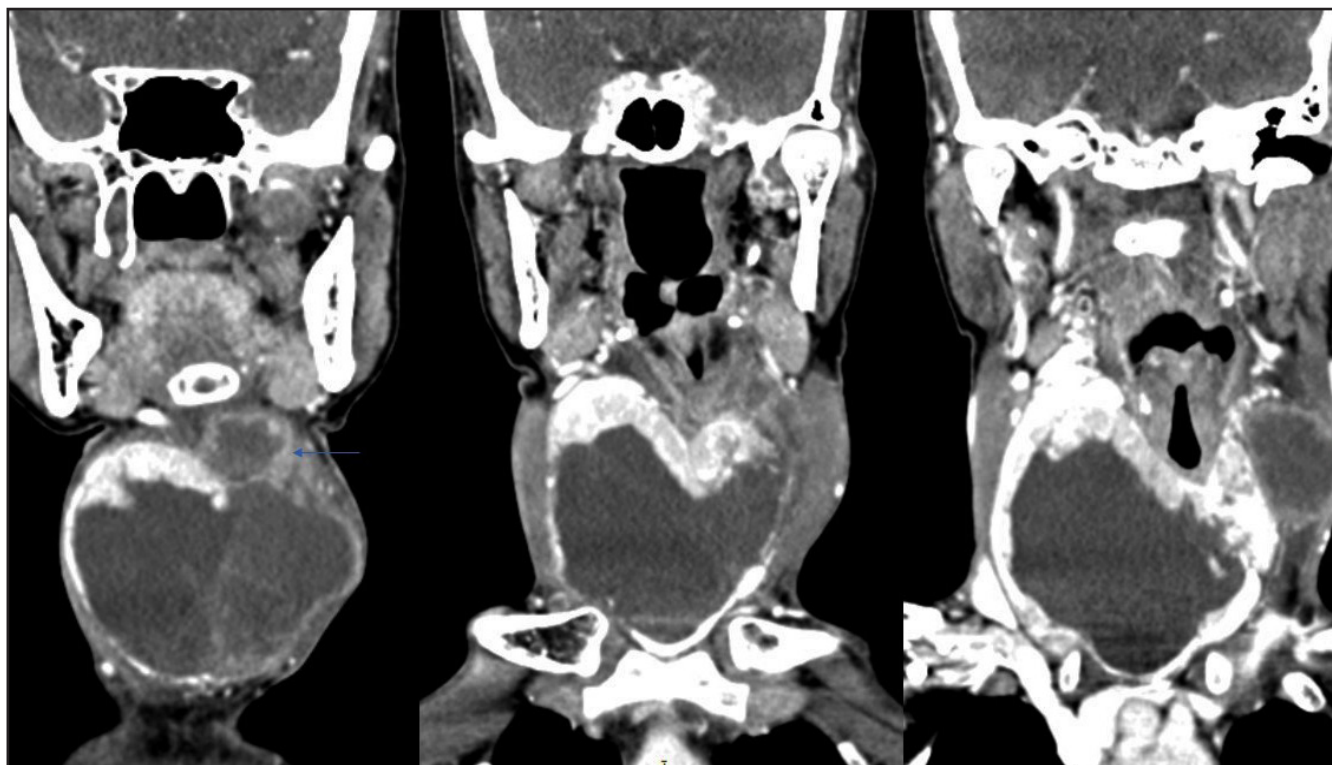


FIGURE 5. Coronal reformatted images of CECT neck showing complex cystic thyroid mass lesion with local lymph nodal metastasis (arrow).

tracheal compression on short-term follow-up.

Primary SCC usually affects older patients between the 5th and 6th decades and is traditionally associated with a history of goiter. In most cases, the patient presents with a rap-

idly enlarging neck mass with local infiltration, followed by symptoms of compression of adjacent neck structures, such as dyspnea and hoarseness.³ Metastases from primary SCC are common, especially to cervical lymph nodes (35%), but they may also occur

in the lungs, bones, liver, kidney, and heart.⁴

Although CT is the preferred imaging modality, both CT and magnetic resonance imaging (MRI) scans are useful for assessing and characterizing thyroid swellings. They allow

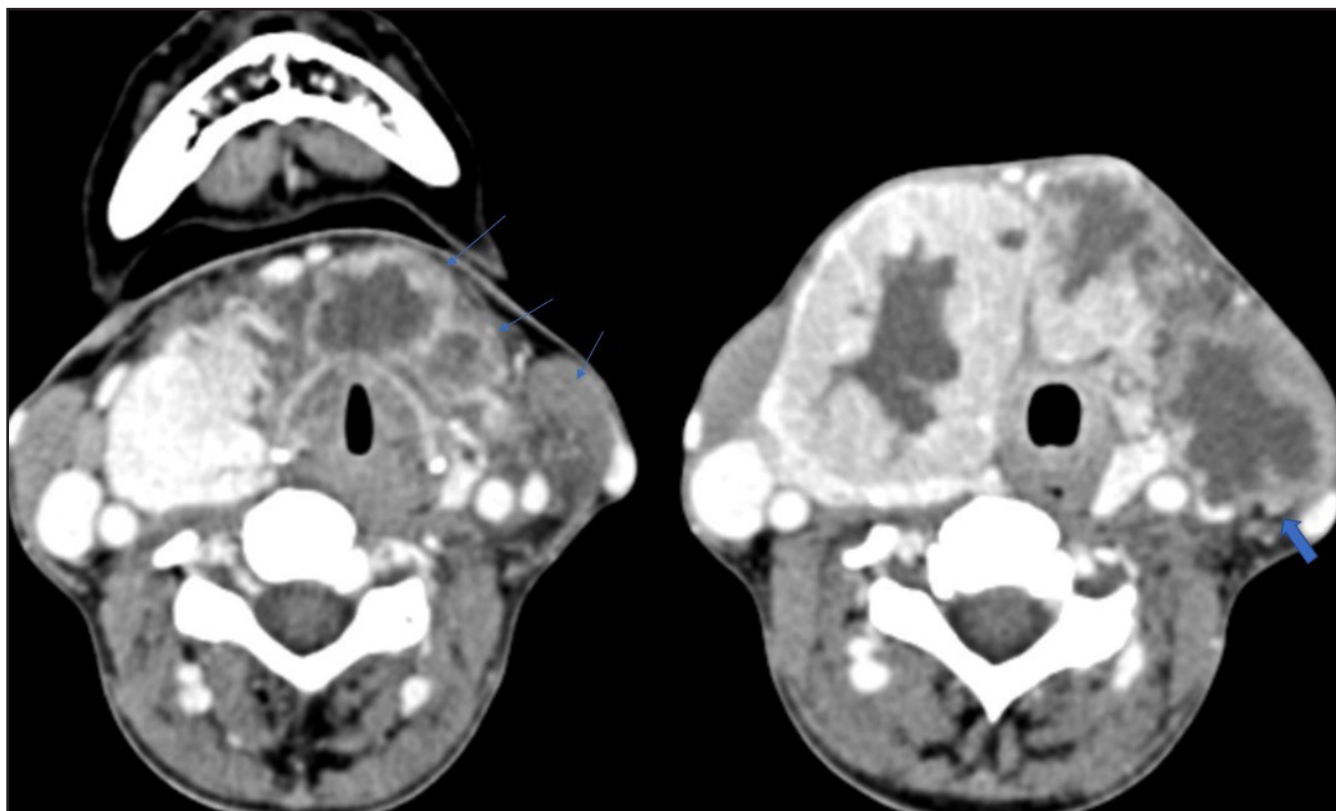


FIGURE 6. Axial postcontrast images revealing multiple heterogeneously enhancing cervical lymph nodes (arrow) with variable areas of low attenuation within.

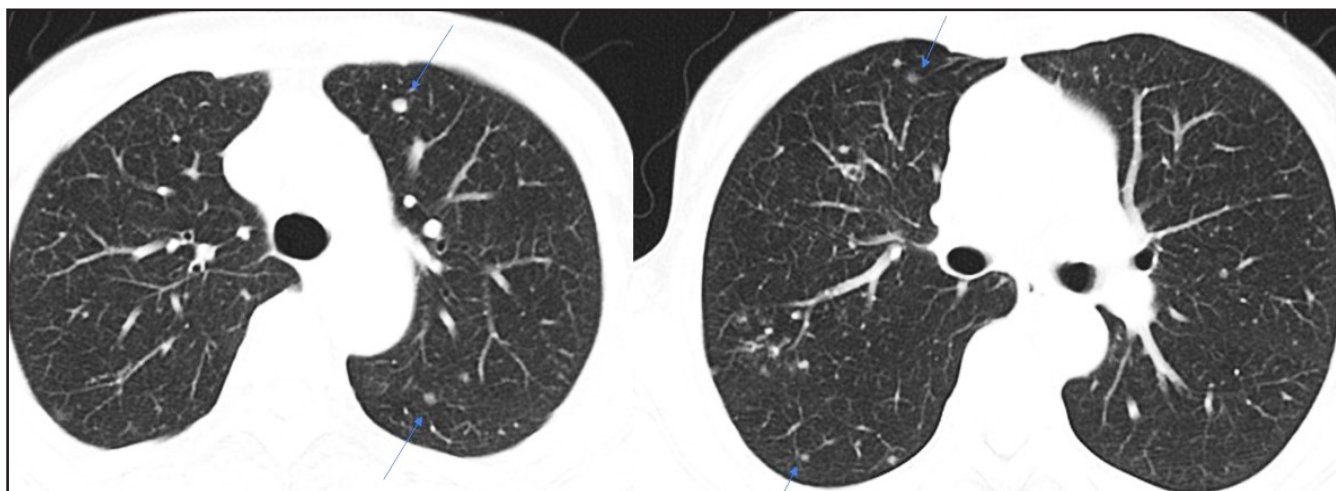


FIGURE 7. Axial images of CT thorax in lung window shows multiple patchy small ground-glass and soft tissue density nodules (arrows).

delineation and differentiation of thyroid masses from adjoining neck masses and enable assessment of the adjacent laryngotracheal region to discern displacement, luminal narrowing, and vascular displacement and invasion. Evaluation should also

assess calcification, cyst formation, necrosis, hemorrhage, lesion margin definition and extraglandular extension. Computed tomography of the chest, abdomen, and pelvis helps exclude a primary source for secondary SCC of the thyroid gland.⁵

SCC is of unknown etiology, as the thyroid typically lacks squamous epithelium. There are three theories to explain the pathophysiology. First, the embryonic nest theory postulates the origin of squamous cells from the remnants of thyroglossal duct or the epi-

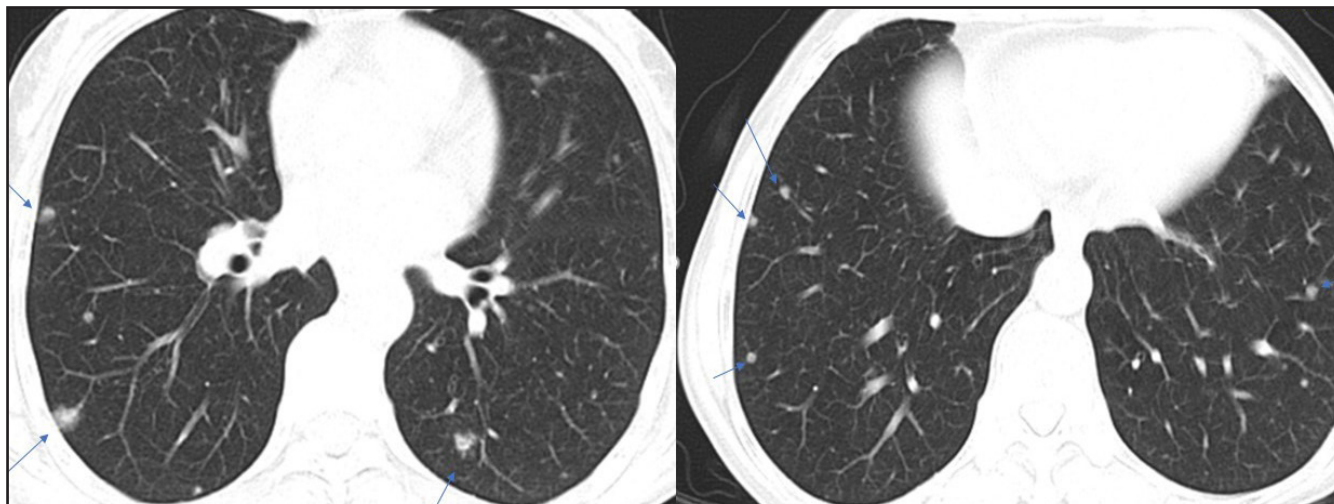


FIGURE 8. Axial CT images of lung showing multiple scattered metastatic nodules (arrows).

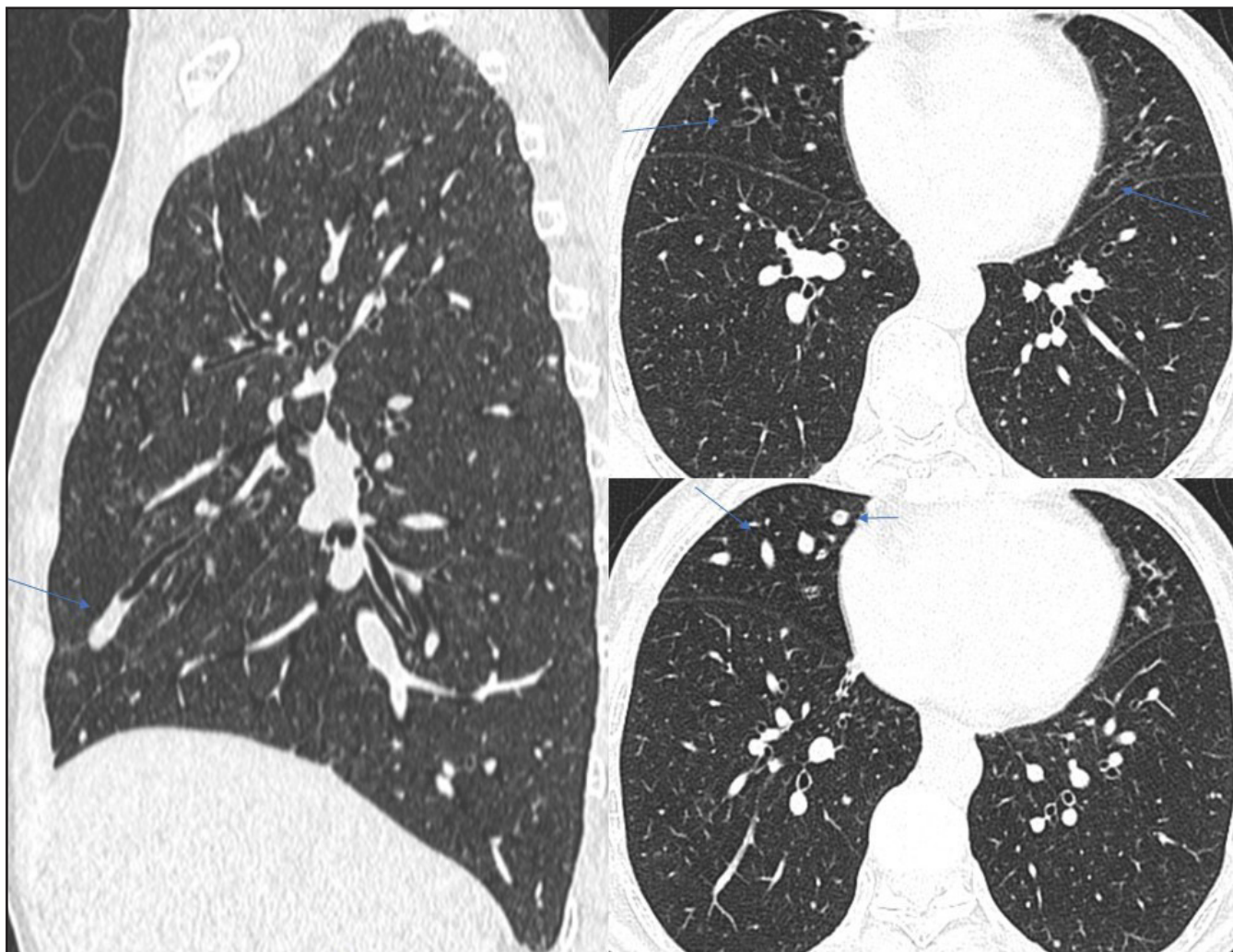


FIGURE 9. Sagittal and axial images of CT thorax in the pulmonary window showing cylindrical bronchiectasis (arrows) in the right middle lobe and left lingular upper lobe segment with few showing mucus plug impaction.

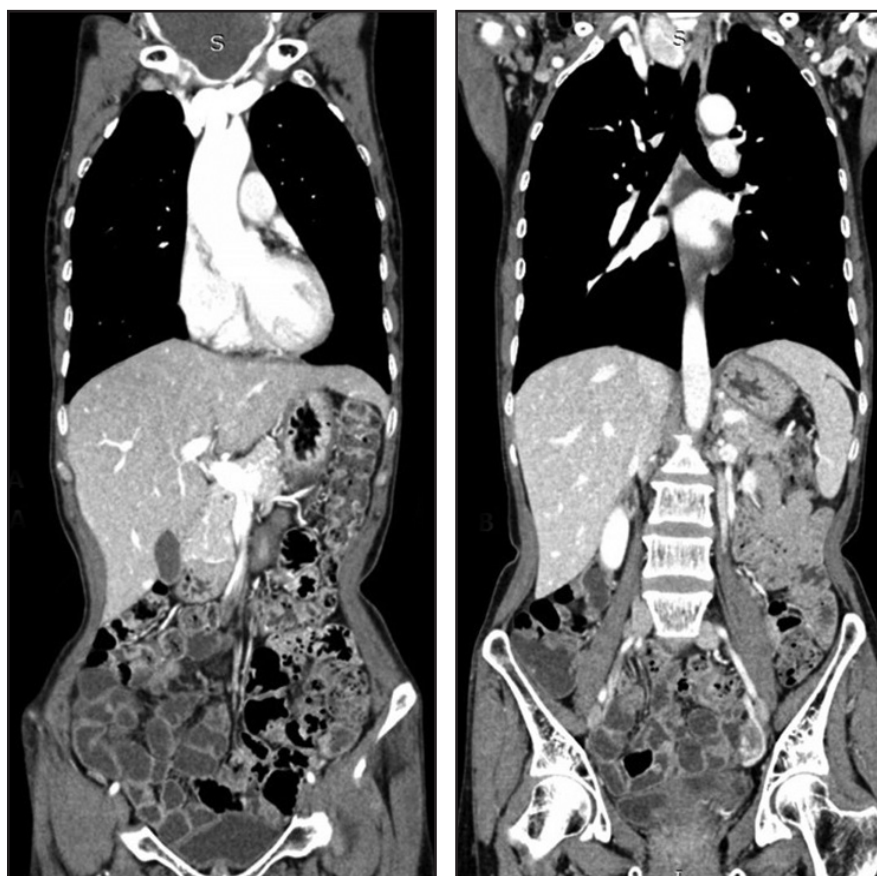


FIGURE 10. Coronal reformat images of thorax and abdomen at the level of the cardia and tracheal bifurcation show no mediastinal lymphadenopathy.

thelium of the thymus.^{4,6} Second, the metaplasia theory suggests that these cells present because of environmental stimuli (inflammation and Hashimoto's thyroiditis).⁷ Third, the de-differentiation theory indicates that existing papillary, follicular, medullary, and anaplastic thyroid carcinoma de-differentiate into SCC.⁸

Cho et al performed a systematic review and individual participant data meta-analysis regarding primary SCC of the thyroid. In this meta-analysis of 89 patients, SCC presents at a mean age of 63 years (range 24-90 years) with a two-times female preponderance and anterior neck mass as the most frequent presenting complaint. Fine-needle aspiration cytology (FNAC) could accurately diagnose the cases in less than one-third of patients (as in our case)

with more than half remaining nondiagnostic or giving papillary thyroid carcinoma as a false diagnosis. Complete surgical resection of the tumor was the only significant prognostic factor in the multivariate analysis, but the benefit of adjuvant treatment could not be proven. Moreover, the prognosis of these patients was poor (only 20% 3-year survival rate).⁹

Anaplastic thyroid carcinoma, carcinoma showing thymus-like elements (CASTLE) disease of the thyroid gland and metastasis from adjacent organs are the differentials to be kept in mind while diagnosing squamous cell carcinoma of the thyroid.³

CONCLUSION

Squamous cell carcinoma of the thyroid is an extremely rare, aggressive,

and highly lethal neoplasm. Though primary SCTC may coexist with papillary and anaplastic thyroid cancer, pure SCTC, occurring solitarily without other tumors, is extremely rare. Computed tomography plays an important role in detection and characterization of the lesion, extrathyroid invasion, and metastases.

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Prepared by Dr. Chauhan while an Assistant Professor of Radiodiagnosis; Dr. Sarawagi while an Associate Professor and Radiologist; Dr. Kumar while an Assistant Professor and Interventional Radiologist, and Dr. Malik while Head of Department of Radiodiagnosis, All India Institute of Medical Sciences, Bhopal, India.