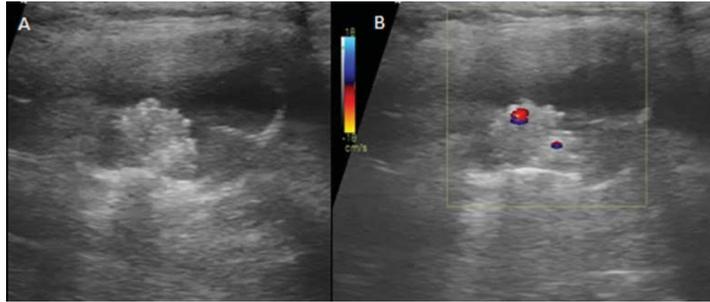
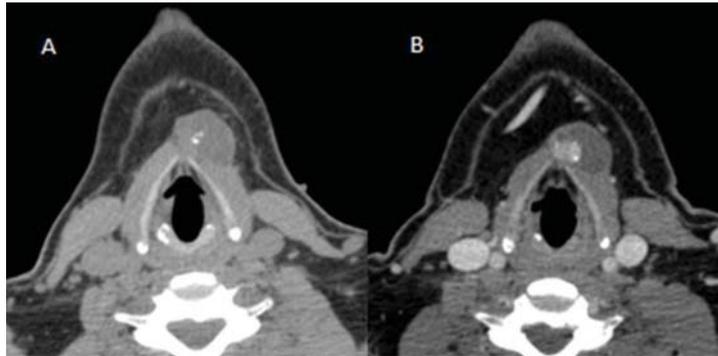


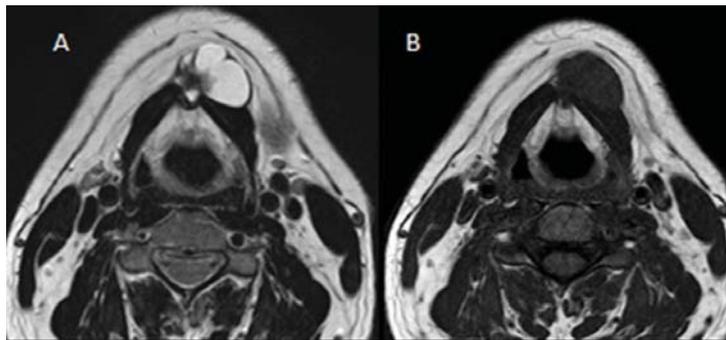
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**Figure 1.** Transverse ultrasound of neck (A) shows hypoechoic cystic lesion in left paramedian infrahyoid location with posterior acoustic enhancement. A solid hyperechoic nodule is seen along the right posterolateral wall of cyst. On Color Doppler image (B) internal vascularity is seen within the nodule.



**Figure 2.** Axial plain (A) and postcontrast (B) CT images confirm the hypodense cyst in infrahyoid location embedded in strap muscles of neck. The solid nodule reveals intermediate density with few tiny hyperdense calcific foci and homogenous postcontrast enhancement.



**Figure 3.** The cyst appears hyperintense on axial T2 weighted image (A) and hypointense to isointense on axial T1 weighted image (B) The solid nodule appears hypointense on T2 weighted image and intermediate on T1 weighted image.

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A 34-year-old man presented to the otolaryngology outpatient clinic with a 6-month history of a painless swelling in his neck, and had noticed gradual enlargement. Physical examination revealed a 2 × 2 cm cystic mass in the left paramedian location in the anterior neck between the thyroid cartilage and hyoid bone. The lump was moving with deglutition and protrusion of tongue consistent with thyroglossal duct origin. Ultrasound of the neck reveals a well-defined cystic lesion measuring 2.7 × 1.5 cm just inferior to the hyoid bone in the left paramedian location. A small subcentimeter solid hyperechoic nodule is seen in the cyst with internal vascularity (Figure 1). No evidence of size significant cervi-

cal adenopathy is seen. Thyroid gland was in the normal location without any focal lesion. For further evaluation, contrast-enhanced CT scan of the neck with limited MRI was performed. CT scan reveals a well-defined hypodense cystic lesion in the infra-hyoid neck in left paramedian location. A small hypodense solid component is seen along the right lateral wall of cyst with tiny punctate calcific foci and intense homogenous post-contrast enhancement (Figure 2). The cystic component appears hyperintense on T2 and hypointense to intermediate intensity on T1 weighted images. The solid nodule appears hypointense on T2 and intermediate intensity on T1 weighted images (Figure 3). Based on solid enhancing nodule with tiny calcific foci in thyroglossal cyst, further evaluation with FNAC was suggested. USG guided FNA from the solid component was performed using 24G needle.

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**What is your diagnosis?  
 See the next page for diagnosis**

Thyroglossal duct cyst is the most common congenital neck mass and the majority of patients present in the first decade of life.<sup>1</sup> Thyroid carcinoma arising in a thyroglossal duct cyst is rare, affecting less than 1% of cysts.<sup>2</sup> The average age at presentation for thyroglossal duct carcinoma is 40 years with mild female predominance.<sup>3,4</sup> Thyroglossal duct cyst (TDC) is diagnosed clinically. Imaging is used to confirm the clinical diagnosis and identify the presence of the normal thyroid gland. Cross sectional imaging also provides preoperative information about the presence of solid component within the cyst. Thyroglossal duct carcinoma may be clinically indistinguishable from a benign thyroglossal duct cyst. A preoperative radiological diagnosis can change the type of surgery that is performed and provide prognostic information. In our case, the presence of partly calcified enhancing solid mural nodule in the thyroglossal cyst was suggestive of malignancy, which was confirmed on FNAC as papillary carcinoma arising from a thyroglossal duct cyst.

Thyroglossal cysts are seen in midline or paramedian of the anterior neck around the hyoid bone. The majority of thyroglossal cysts are seen in infrahyoid location. A well-defined anechoic lesion with posterior acoustic enhancement as well as thin, and smooth walls is the typical imaging appearance of uncomplicated thyroglossal cyst on ultrasound. Thyroglossal cyst may appear as a pseudo-solid or hypoechoic mass. Ahuja, et al. reviewed sonograms of 40 patients retrospectively to study the appearance of thyroglossal cyst in adults.<sup>5</sup> More than 50% of thyroglossal cysts were found to reveal heterogenous or pseudosolid appearance on ultrasound. However, posterior acoustic enhancement was seen in the majority of the patients. Presence of a solid nodule with internal vascularity strongly suggests the possibility of thyroglossal duct carcinoma.

On CT scan, thyroglossal cyst appears as a well defined hypodense cystic lesion in the midline or paramedian location in the anterior neck without significant postcontrast enhancement. A minimal thin peripheral enhancement may be seen. The most common location of the thyroglossal cyst is infrahyoid. On MRI, these cysts reveal homogenous T2 hyperintense and T1 hypointense signal. Thyroglossal cyst may demonstrate heterogenous signal on T1 and T2 weighted images in cases of superadded infection or hemorrhage. Barton F. Branstetter, et al. retrospectively reviewed the CT appearance of thyroglossal duct carcinoma in six patients.<sup>6</sup> They concluded that carcinoma should be considered in thyroglossal duct cysts that have a mural nodule, or calcification or both. The solid nodule in thyroglossal duct carcinoma shows postcontrast enhancement. Thyroglossal duct carcinoma appears as T1/T2 intermediate intensity nodule within the T2 hyperintense cyst. Calcific foci within the solid nodule appear hypointense on both T1 and T2 weighted images.

The ectopic thyroid tissue within the thyroglossal cyst may be seen as solid hyperdense enhancing nodule in the thyroglossal cyst and are often confused with malignancy. However, calcification is not seen in cases of ectopic thyroid tissue. The infected thyroglossal cyst may appear heterogenous in density and may show focal wall thickening mimicking malignancy in thyroglossal cyst on cross sectional imaging. History of fever and local tenderness in these cases suggest the proper diagnosis. A rapid increase in size or the presence of a firm palpable nodule may be suggestive

of malignancy, but diagnosis is usually based on the pathologic findings.<sup>7</sup> However, cross sectional imaging can demonstrate solid component in thyroglossal cyst with or without adjacent bony/soft tissue invasion. Cross sectional imaging play an important role in pre-operative diagnosis of malignancy, its extension and treatment planning.<sup>6,8,9</sup> Fine-needle aspiration may confirm the presence of thyroglossal duct carcinoma. However, negative FNAC does not exclude the diagnosis of thyroglossal duct carcinoma.<sup>10,11</sup> Majority of thyroglossal duct carcinoma are the papillary type of carcinomas.<sup>12</sup> Associated thyroid gland papillary carcinoma is seen in 30% to 40% of cases of thyroglossal duct carcinoma. The prognosis of thyroglossal duct carcinoma is excellent.

In conclusion, malignancy within a thyroglossal duct cyst is very rare and usually indistinguishable clinically from the benign thyroglossal cyst. Ultrasound findings of solid nodule with internal vascularity and CT findings of solid enhancing nodule within a cystic lesion with or without calcification can allow a preoperative diagnosis of thyroglossal duct carcinoma. Imaging is also helpful to detect local invasion, cervical lymphadenopathy and staging of carcinoma.

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