

# Cytodiagnosis of a Thyroglossal Duct Cyst in a Tertiary Facility: A Case Report of a 27-Year-Old Female

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## ABSTRACT

A thyroglossal cyst is an inherent anomaly originating from remnants of the thyroglossal duct, a structure that connects the thyroid gland to the tongue during early embryonic development. Typically benign in nature, these cysts are situated along the midline of the neck, often in close proximity to the hyoid bone. In this report, we present an extraordinary and atypical case of a thyroglossal duct cyst in a 27-year-old female who manifested a painless swelling in the midline of her neck. A subsequent ultrasonogram revealed the presence of a thyroglossal duct cyst in the anterior neck region. Notably, fine needle aspiration cytology (FNAC) yielded benign results. In addition to detailing the cyto-diagnostic features characteristic of this specific lesion, our report underscores the significance of FNAC as a foremost diagnostic approach in the assessment of uncommon anterior neck masses. Through this case, we emphasize the importance of FNAC in the early and accurate management of such distinctive presentations.

**Keywords:** Cytology, Fine Needle Aspiration, Thyroglossal Cyst.

## INTRODUCTION

Thyroglossal duct cysts (TGDCs) are the most prevalent congenital neck cysts, constituting approximately 70% of cases [1], and occurring in about 7% of the general population [2]. Despite their common occurrence, thyroglossal duct cysts are relatively uncommonly reported in the literature. These cysts typically manifest as mobile, non-tender, and non-lobular swellings in the neck, usually located below the hyoid bone [3]. Cytodiagnosis of a thyroglossal duct cyst involves the collection of cell or fluid samples from the cyst through a fine needle aspiration (FNA) procedure. This technique entails inserting a thin needle into the cyst to aspirate cells for subsequent analysis. The collected cells are then examined under a microscope to discern their characteristics. Notably, instances of thyroglossal duct cysts located in the anterior neck are infrequently documented in the literature. In this context, our aim was to present a unique case involving the diagnosis of a thyroglossal duct

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through fine needle aspiration cytology, highlighting the rarity and diagnostic approach of this condition.

### CASE PRESENTATION

A 27-year-old female presented to the Fine Needle Aspiration Cytology (FNAC) clinic at Mulago National Referral Hospital with a painless midline anterior neck mass that had been

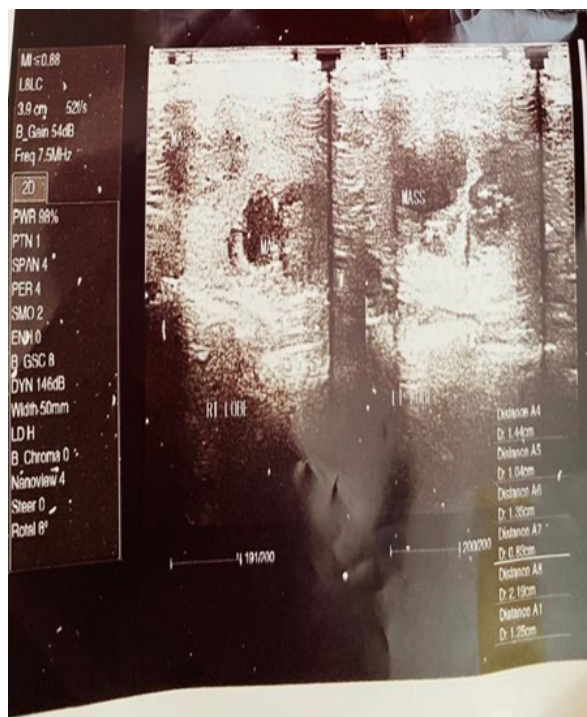
progressively enlarging over a four-month period (Figure 1). The patient reported no breathing or swallowing difficulties, and no familial history of thyroid carcinoma was reported. Biochemical tests of thyroid function revealed a TSH level of 0.349 mIU/ml (Reference Range: 0.600-4.000) and a T4 level of 8.00 µg/dl (Reference Range: 5.00-12.00).



**Figure 1.** Anterior neck midline swelling.

Ultrasonography of the anterior neck revealed a well-defined hypoechoic mass situated midline between the strap muscles, below the hyoid bone. Color Doppler imaging showed

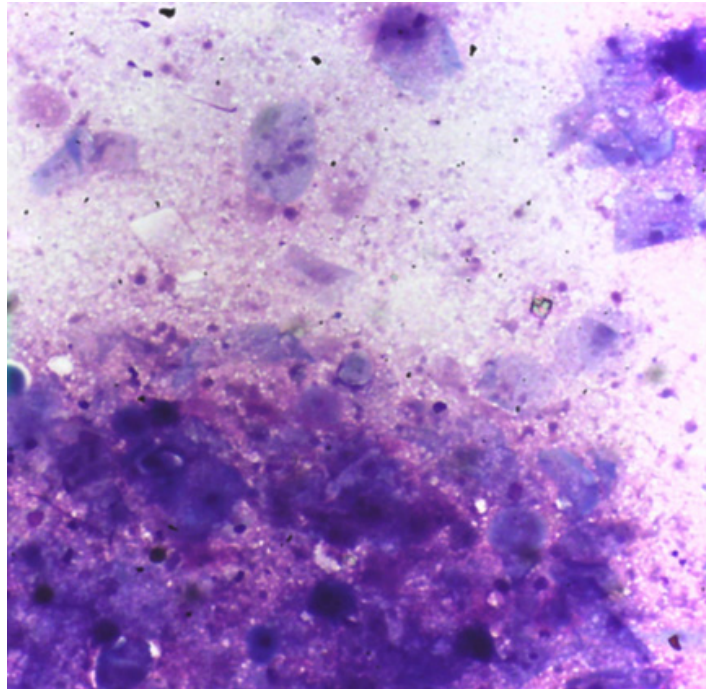
no vascular flow within the mass (Figure 2). On physical examination, the mass was palpable, soft in consistency, non-tender, and exhibited mobility upon swallowing.



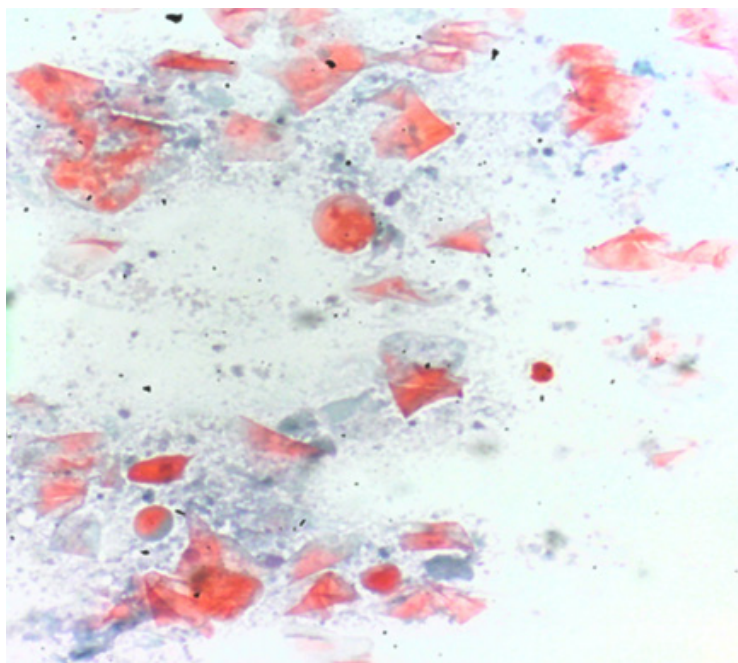
**Figure 2.** Ultrasonogram of the anterior neck swelling showing a thyroglossal duct cyst.

Following informed consent from the patient, a 23-gauge needle was used to aspirate a yellowish-mucoid material from the nodule. The aspirated material was used to create two slides—one slide air-dried for Diff-Quick stain and the other fixed in alcohol for Papanicolaou stain. Cytological examination of the Fine Needle Aspiration Cytology (FNAC)

slides revealed numerous anucleated squames, mature squamous cells, and necrotic debris (Figure 3a & Figure 3b). The FNAC results were indicative of a benign aspirate consistent with a thyroglossal cyst. Consequently, excision was recommended as the course of action.



**Figure 3a.** Photomicrograph of Fine needle aspirate reveals numerous anucleate squames and mature squamous cells (Diff quick stain X200)



**Figure 3b.** Photomicrograph of Fine Needle Aspirate reveals a dirty necrotic background (Papanicolaou stain X200).

## DISCUSSION

Thyroglossal duct cysts (TGDCs) represent a prevalent congenital anomaly manifesting as anterior cervical masses. These cysts stem from remnants of the thyroglossal duct, a structure originating during embryonic thyroid development. The duct typically regresses as the thyroid migrates to its final position in the neck, but incomplete obliteration can lead to the formation of TGDCs. Although commonly encountered in pediatric patients, TGDCs can also arise later in life [4]. Typically situated midline, TGDCs can occasionally occur paramedian and are commonly found below the hyoid bone [5].

In the case presented, the patient exhibited a painless midline neck swelling, consistent with a thyroglossal duct cyst. The utilization of fine needle aspiration cytology (FNAC) facilitated a definitive diagnosis. FNAC offers a sensitivity, specificity, and diagnostic accuracy of 100% for TGDCs, underscoring its role as the primary diagnostic modality for these lesions [6]. The cytologic evaluation of TGDCs reveals diverse cellular components, including proteinaceous material, squamous cells, inflammatory cells, and colloid [7]. Stratified squamous cells and cholesterol crystals distinguish TGDCs from thyroid cystic nodules [8]. Our findings align with these cytologic features, strengthening the accuracy of the FNAC-based diagnosis.

Notably, the FNAC technique offers a simple, safe, and cost-effective means of pre-operative assessment for TGDCs. Its role in the accurate identification of benign lesions is underscored by our case report. This approach obviates the need for more invasive diagnostic procedures, which would be particularly relevant for cystic masses with benign attributes. The successful diagnosis and subsequent recommendation for excision in our case exemplify the clinical utility of FNAC in guiding patient management.

## CONCLUSION

In conclusion, our case contributes to the existing literature by presenting a rare instance of a thyroglossal duct cyst diagnosed through FNAC. The diagnostic accuracy and minimal invasiveness of FNAC make it a valuable tool for the assessment of anterior neck masses. Further research and case reports will likely continue to highlight the crucial role FNAC plays in diagnosing and managing these conditions.

## STUDY APPROVAL STATEMENT

This study was granted a waiver since it did not entail the introduction of novel techniques or procedures. The data

presented in this study are derived from established clinical practices and diagnostic procedures.

## DECLARATION OF PATIENT CONSENT

Written informed consent was duly obtained from the patient for the purpose of publishing this case report along with its accompanying images. A copy of this written consent is readily available and can be provided for review upon request by the Editor-in-Chief of this journal.

## FINANCIAL SUPPORT AND SPONSORSHIP

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## CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest associated with the content presented in this case report.

## AUTHOR CONTRIBUTIONS

M.B. conceptualized and designed the study, conducted a comprehensive literature search, and authored the manuscript. D.A., A.M., T.C, D.W and K.S. conducted preliminary data analysis, contributed to manuscript writing, and participated in shaping the content. Z.C. performed formal data analysis, created visualizations, contributed to study design, and actively participated in manuscript composition. All authors collectively participated in the final review and editing of the manuscript, ensuring its accuracy and coherence.

## DATA AVAILABILITY STATEMENT

All data generated or analyzed during the course of this study are comprehensively included within this article. For any additional inquiries or further information, interested parties are encouraged to directly contact the corresponding author.

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