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Thyroglossal Duct Cysts In CHU/JRA Madagascar : A 10-Year Retrospective Study Highlighting Atypical Presentations and Malignant Potential

Volahasina Francine Ranaivomanana[1]*, Holy Tiana Andrianjafitrimo[1], Rindratsara Lucia Rajoelyna[1] and Nantenaina Soa Randrianjafisamindrakotroka[2]

[1]*Department of Pathology, Joseph Ravoahangy Andrianavalona University Hospital, Antananarivo, Madagascar.*

[2]*Chairman of the Department of Pathology, Medical School of Antananarivo, Antananarivo, Madagascar.*

***Correspondence:**
Volahasina Francine Ranaivomanana, Department of Pathology, Joseph Ravoahangy Andrianavalona University Hospital, Antananarivo, Madagascar.

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ABSTRACT

Thyroglossal duct cyst (TGDC) is the most common congenital cervical anomaly. Although typically located in the midline, it may present with atypical locations. The main concern remains malignant transformation. The aim of this study was to describe the epidemiological, clinical, and histopathological features of TGDC.

This was a retrospective descriptive study including all cases of TGDC diagnosed at the Department of Pathology and Cytology of the Joseph Ravoahangy Andrianavalona University Hospital over a 10-year period, from January 2016 to December 2025.

During the study period, eighteen cases were identified. Patient age ranged from 1 month to 60 years, with a mean of 21.9 ± 20.8 years, and a predominance of patients older than 10 years (55.6%). The sex ratio was 0.5. The main clinical presentation was a midline cervical swelling (55.6%), while 16.7% of cases had an intrathyroidal location. Ectopic thyroid tissue was present in 27.8% of cases. Two cases of associated papillary carcinoma were identified in women aged 30 and 51 years.

Although rare, malignant transformation of TGDC warrants systematic histopathological examination and careful follow-up, particularly in adults.

Keywords

Cervical swelling, Papillary carcinoma, Histology, Thyroglossal duct cyst, Madagascar.

Introduction

Thyroglossal duct cyst is the most common congenital cervical anomaly. Clinically, it presents as a midline neck swelling that moves with swallowing or tongue protrusion. Some variants, such as lateral cervical or intrathyroidal locations, are less frequent and may pose diagnostic challenges. Although most TGDCs are benign, there is a risk of malignant transformation, predominantly into papillary carcinoma. The prevalence of malignancy is low (approximately 1%) but its recognition is essential for appropriate surgical management and postoperative follow-up.

The aim of this study was to describe the epidemiological, clinical, and histopathological features of TGDC managed at CHU/JRA in Antananarivo, Madagascar, and to compare them with data from the literature.

Methods

This was a retrospective descriptive study including all patients

diagnosed with TGDC between January 2016 and December 2025 at CHU/JRA. Data were collected from laboratory registers, pathology request forms, and histopathological reports.

Results

A total of 18 cases of TGDC were identified during the study period.

Age

The mean age was 21.9 ± 20.8 years, ranging from 1 month to 60 years, with a predominance of patients older than 10 years.

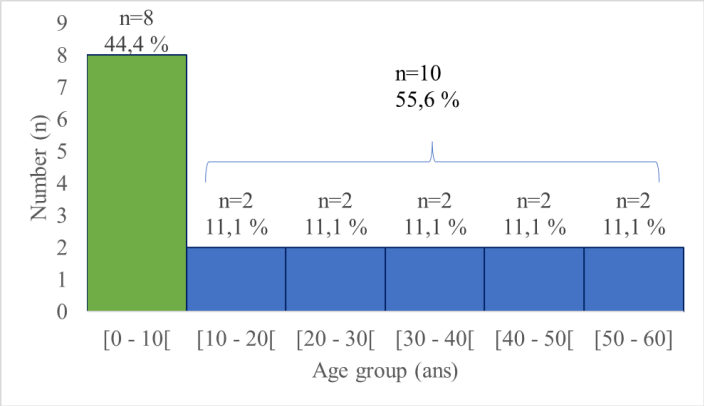

Figure 1: Distribution of patients according to age groups.

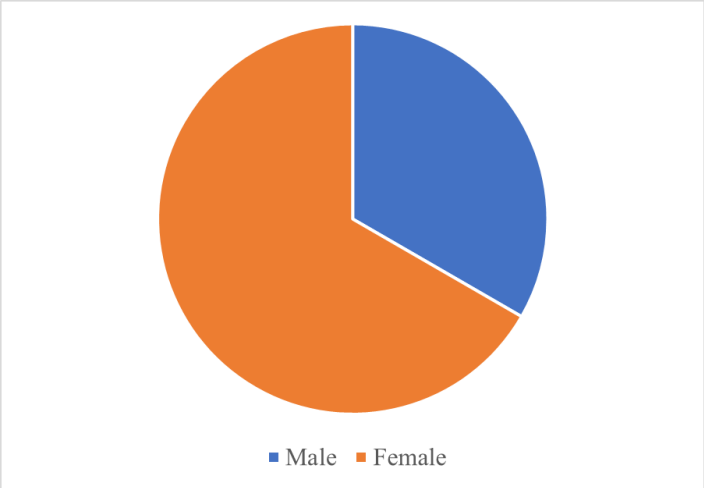

Figure 2: Distribution of patients according to gender.

Clinical findings

The lesion was located in the midline cervical region in most cases (55.6%), while 16.6% were intrathyroidal.

Table 1: Distribution of patients according to clinical information.

Clinical information	Number (n)	Percentage (%)
Midline swelling	10	55,6
Lateral cervical swelling	5	27,8
Intra-thyroid cyst	3	16,6

Histological findings

Histological examination showed cysts lined by respiratory-type epithelium in 72.2% of cases and squamous epithelium in 27.8%. Ectopic thyroid tissue was present in 27.8% of cases. Two women aged 30 and 51 years had papillary thyroid carcinoma arising in a TGDC.

Table 2: Distribution of patients according to histological features.

Histological features	Number (n)	Percentage (%)
Cyst lining		
Respiratory-type epithelium	13	72,2
Squamous epithelium	5	27,8
Ectopic thyroid tissue		
Present	5	27,8
Absent	13	72,2
Associated papillary carcinoma		
Present	2	11,1
Absent	16	88,9

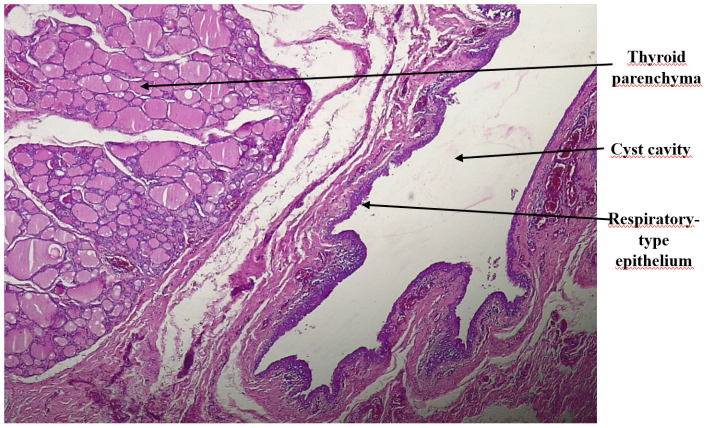

Figure 3: Cyst cavity lined by respiratory-type epithelium within thyroid parenchyma Hematein eosin stain. Magnificationx100

Source: Departement of Pathology CHU/JRA

Discussion

TGDC constitutes the most common congenital cervical malformation, resulting from the persistence of the thyroglossal duct, an embryological structure described by Langman. Incomplete involution between the 5th and 10th weeks of gestation leads to the formation of cysts. Recurrent infections contribute to cyst enlargement and symptomatology. It accounts for approximately 70 % of congenital neck masses in children and can present at any age, from birth to adulthood [5-7].

In this study, 18 cases were collected over 10 years an average of 1.8 cases per year. This nimber is relatively low but is similar to a Malagasy study conducted by Rakotoarisoa AHN in 2017 in Antananarivo with 12 cases in 8 years (1.5 cases per year), which is comparable to another Malagasy study reporting 1.5 cases per year. However, in other series in the literature, the frequency of this pathology is higher. Adoga AA et al. in 2010 in Nigeria [8] reported 38 cases over 5 years (7.6 cases per year). In a Japanese

pediatric center, Hikita T et al. in 2004 [9] recorded 60 cases over 10 years (6 cases per year). In Europe, Mondin V et al. in 2008 in an Italian center described 47 cases over 10 years, or 4.7 cases per year [5]. In Canada, Allard RHB in 1982 compiled 50 cases over 8 years (6.25 cases per year) [1]. These data could be explained by better access to hospital facilities, care, and imaging.

According to age, in 55.6% of cases in this series, patients were over 10 years old. In African and Malagasy series, the diagnosis is often later. For Adoga AA et al. in 2010 in Nigeria, 65.8 % of patients were over 10 years old at the time of diagnosis [8], 58 % for Rakotoarisoa AHN in 2017 in Madagascar [7]. However, in an Asian series, patients under 10 years old were predominant with 58 % for Hikita T et al. in 2004 in Japan. European and North American series also reported early diagnosis: Mondin V et al. in 2008 in Italy [5] and Perkins JA et al. in 2006 in the United States [6] reported patients under 10 years old in 57% and 80% of cases respectively.

Regarding gender, the female predominance observed in this study with a sex ratio of 0.5 is consistent with some African and European series such as that of Adoga AA et al. in 2010 in Nigeria [8] and Allard RHB in 1982 in Canada [1], with a sex ratio of 0.65 and 0.92 respectively. These variations could be explained by differences in recruitment, local consultation practices, and inclusion of adult or pediatric patients.

In this series, median cervical swelling represented the predominant clinical sign (55.6%). This proportion is slightly lower than the 70–80% reported in Western series such as that of Allard RHB in 1982 in Canada [1] and Acierno SP et al. in 2007 in the United States [10], with a median location in 76% and 72% of cases, respectively. Lateral and intra-thyroid locations accounted for 27.8% and 16.6% of cases, respectively, in this series. These atypical forms are rare but well documented in the literature. Prabha BB et al. in 2020 in India recruited two cases of intra-thyroid location. Lateral locations, although less frequent, have also been reported in some African and European series. In the series by Said M et al. in Pakistan in 2014, 20% of patients presented with a lateral TGDC [11]. These anatomical variations complicate clinical diagnosis and emphasize the importance of systematic imaging, especially when the mass is not located on the midline. Precise identification of the location is essential for planning surgery and avoiding complications, particularly during the removal of intra-thyroid or lateral masses. Lateral or atypical presentations could be explained by variations in the embryological course of the duct or by repeated inflammatory phenomena that alter the topography of the cyst.

Histologically, in this series, histological analysis revealed cavities lined in the majority of cases by respiratory-type epithelium (72.2%) and squamous epithelium (27.8%), with the presence of ectopic thyroid tissue in 5 cases (27.8%). These morphological features are consistent with data from the literature. Prabha BB et al. in 2020 in India [10] observed that intrathyroidal locations are frequently accompanied by normal or hyperplastic thyroid tissue in the cyst, which can complicate histological diagnosis. Adoga AA et al. in 2010 in Nigeria [8] reported a similar proportion of cysts containing ectopic thyroid follicles, highlighting the universality of this embryological characteristic. In Madagascar, Rakotoarisoa AHN in 2017 [7] also noted that ectopic thyroid tissue was present in nearly 30% of the collected TGDC, confirming our observations.

The main concern regarding a TGDC is malignant transformation. Although rare, this possibility is well recognized, with a reported frequency of 0.7 to 1% in large series [1,10]. In the present study, two cases were associated with papillary carcinoma, one in a 30-year-old woman and the other in a 51-year-old woman. These findings are consistent with the literature: Perkins JA et al. in 2006 in the United States described several cases of papillary carcinoma arising in TGDC, usually in adults, emphasizing that the risk increases with age and the presence of ectopic thyroid tissue [6]. From a pathophysiological perspective, malignant transformation is thought to be related to the presence of thyroid tissue within the cyst, which is exposed to the same tumorigenic mechanisms as the normal thyroid gland. Genetic mutations reported in the literature, particularly BRAF V600E, have been identified in some papillary carcinomas arising in TGDC, confirming the same thyroid origin as conventional carcinomas [12,13]. Thus, although malignancy is rare, this possibility necessitates systematic histological examination of any excised TGDC, especially in adults, and justifies appropriate postoperative follow-up.

Conclusion

Thyroglossal duct cyst remains a common cervical condition, typically located in the midline and slightly more frequent in females. Notable features in this series include delayed diagnosis, a relatively high proportion of atypical locations (44.4%), and the presence of ectopic thyroid tissue (28%). Although malignant transformation is rare, it necessitates systematic histopathological examination and careful follow-up, especially in adults. Variations in epidemiological and anatomical features across regions highlight the importance of a multidisciplinary approach combining clinical evaluation, imaging, and histology to optimize management and prevent complications.

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