

Thyroid Cancers Diagnosed at the Department of Pathology of CHU/JRA

Volahasina Francine Ranaivomanana¹, Holy Tiana Andrianjafitrimo¹,
Haingo Voahangy Rabetafika Ranaivoson¹ , Nantenaina Soa Randrianjafisamindrakotroka²

¹Pathology Department, Joseph Ravoahangy Andrianavalona University Hospital, Antananarivo, Madagascar

²Chairman of the Pathology Department, Medical School of Antananarivo, Antananarivo, Madagascar

Email: volaasina@gmail.com

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Abstract

Background: Thyroid cancer is an uncommon malignancy compared with other cancer types and exhibits considerable histological, molecular, and clinical heterogeneity. While the majority of differentiated thyroid carcinomas follow an indolent clinical course, a subset demonstrates aggressive behavior associated with an increased risk of recurrence and disease-related mortality. **Methods:** A retrospective, descriptive study was conducted on thyroid cancers diagnosed at the Department of Pathology of CHU/JRA, Antananarivo, Madagascar, over a five-year period, from January 2017 to December 2021. All cases with histopathological confirmation of primary thyroid carcinoma were included. Secondary thyroid involvement due to direct extension from adjacent tumors or metastatic disease was excluded. **Results:** A total of 57 cases were identified during the study period. Patient ages ranged from 15 to 75 years, with a mean age of 46.2 ± 12 years, and a predominance of cases in the 45 - 60-year age group. There was a strong female predominance, with a female-to-male ratio of 2.4:1. The most common mode of presentation was a cervical mass, observed in 94.7% of patients. Macroscopically, nodules were predominantly solid in appearance (36.6%). Papillary thyroid carcinoma was the most frequently diagnosed histological subtype, accounting for 78.9% of cases. **Conclusion:** Optimal management of thyroid cancer requires a multidisciplinary approach integrating clinical, radiological, and histopathological data to ensure accurate diagnosis and appropriate therapeutic decision-making.

Keywords

Cancer, Histology, Papillary Carcinoma, Thyroid

1. Introduction

Thyroid cancer is the most common endocrine tumor, but it is relatively rare com-

pared to other types of cancer. Its incidence has increased in recent decades. With 140,000 cases diagnosed worldwide each year, thyroid cancer accounts for 1% of all cancers. It is generally more common in women, particularly between the ages of 30 and 50. In Madagascar, it is difficult to determine the exact frequency of these cancers because the National Cancer Registry has not yet been established. Hence, the interest of this study.

The aim of this study is to determine the epidemiological, clinical, and anatomopathological profiles of thyroid cancers diagnosed at the Department of Pathology of the University Hospital Center Joseph Ravoahangy Andrianavalona.

2. Materials and Methods

A cross-sectional, retrospective, descriptive study of thyroid cancers was conducted over a 5-year period, from January 2017 to December 2021. All cases of thyroid cancer confirmed by histology were included in the study. Cancers involving local tumor extension (which referred to non-thyroid primary tumors invading the thyroid gland) and metastatic cancers were excluded.

This retrospective study was conducted in accordance with the principles of the Declaration of Helsinki. All patient data were fully anonymized prior to analysis to ensure confidentiality.

3. Results

Among the 257 thyroid specimens received in the laboratory, 57 cases were diagnosed as thyroid cancer, accounting for 22.2% of thyroid pathologies and 0.4% of all samples received by the laboratory. The age of the patients ranged from 15 to 75 years, with a mean age of 46.2 ± 12 years. A predominance of patients between 45 and 60 years of age was observed (Figure 1). A clear female predominance was noted, with a sex ratio of 0.42 (Figure 2). The lesion was discovered during

- Age

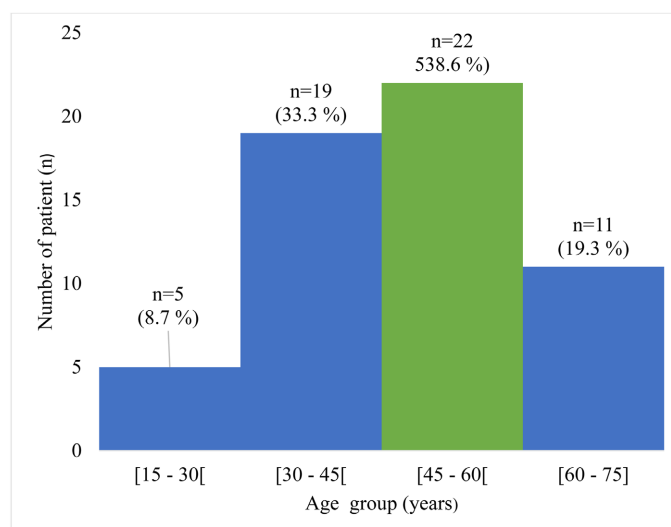


Figure 1. Distribution of cases by age group.

- Gender

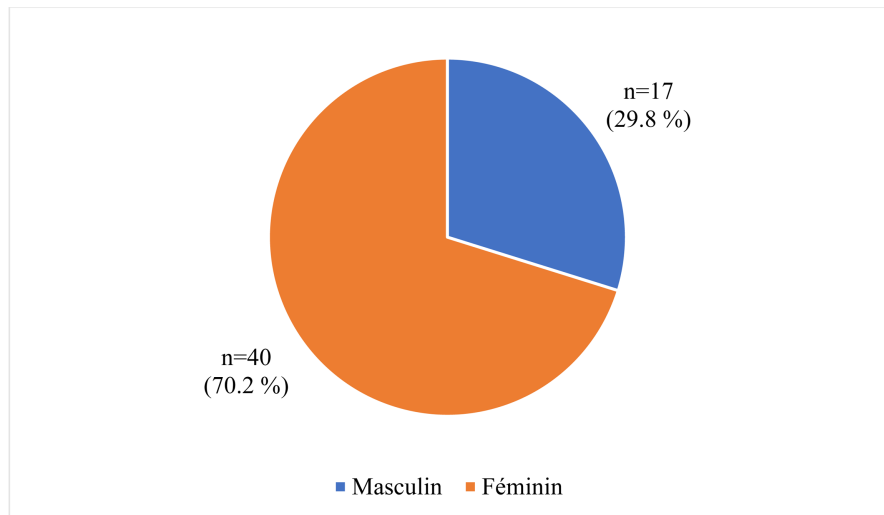


Figure 2. Distribution of cases by gender.

examination of a cervical swelling in 94.7% of cases (**Table 1**). The nodules were fleshy in appearance in the majority of cases (36.6%) (**Table 2**). Papillary thyroid carcinoma was the most commonly diagnosed type, accounting for 78.9% of cases (**Table 3**). The size of the tuor nodules was greater than 4 cm in the majority of cases (42.1%), without extra-thyroid extension, corresponding to stage pT3a (**Table 4**).

Table 1. Distribution of cases according to circumstances of discovery.

Clinical manifestations	Number (n = 57)	Percentage (100%)
Cervical swelling	54	94.7
Signs of compression	3	5.3

Table 2. Distribution of cases according to the macroscopic appearance of nodules.

Clinical manifestations	Number (n = 57)	Percentage (100%)
Fleshy	26	45.6
Mixed (colloid, whitish)	31	54.4

Table 3. Distribution of cases according to histological types.

Histological types	Number (n = 57)	Percentage (100%)
Papillary carcinoma	47	82.5
- Classic	25	43.9
- Vesicular architecture	18	31.6
- NIFT-P	1	1.8

Continued

- Oncocytic	1	1.8
- High cell	2	3.5
Non-invasive vesicular carcinoma	3	5.3
Undifferentiated carcinoma	4	7
Poorly differentiated carcinoma	1	1.8
Rare tumors	2	3.5
- Squamous cell carcinoma	1	1.8
- Clear cell carcinoma	1	1.8

Table 4. Distribution of cases according to nodule size and pT stage.

Size of nodules (cm)	Stage pT	Number (n= 57)	Percentage (100%)
≤1	pT1a	7	12.3
>1 et ≤2	pT1b	10	17.5
>2 et ≤4	pT2	16	28.1
>4	pT3a	24	42.1

4. Discussion

During the study period, 57 cases of thyroid cancer were collected, representing 0.4% of all samples received by the laboratory and 22.2% of thyroid pathologies. This is similar to studies by Vanderpump PJ in the United Kingdom in 2011 [1] and Wémeau JL in France in 2022 [2], each with 1% of cases. Thyroid cancers are relatively rare due to several biological and environmental factors. The thyroid is less exposed to the common risk factors of other cancers, particularly due to its low cell regeneration, which limits cancerous mutations. Genetic mutations specific to thyroid cancer are rare, and although some familial predispositions exist, they are limited to particular forms. Ionizing radiation, although a known risk factor, is less common in many parts of the world where radiation levels are low [3]. Furthermore, the apparent increase in the incidence of these cancers in certain regions may be attributed to improvements in diagnostic techniques such as ultrasound and fine needle aspiration, which allow for earlier detection of small, often asymptomatic tumors, without necessarily reflecting a true increase in the disease.

Age is a determining factor in the onset of thyroid disorders. In this study, the age of patients ranged from 15 to 75 years, with an average of 46.2 ± 12 years and a peak frequency in the 40 - 60 age group (38.6%). This result is more or less similar to that reported by Rasolofomamonjy R in Antananarivo in 2017, with an average age of 39.08 years and extremes of 3 and 79 years. The most affected age group was 45 to 60 years (22.71% of cases) [4]. This similarity in the two results

could be explained by the fact that both studies were conducted in Antananarivo, so the study population may have had the same lifestyle habits and the same level of exposure to various risk factors, all rooted in a context specific to Madagascar. For other series in the literature, the average age at diagnosis was slightly higher. Darre T *et al.*, in Guinea in 2014, found an average age of 54.3 years [5]. For Junk CK *et al.* in the United States from 1974 to 2009, the average age rose from 37 to 53 years [6]. In the various series, a predominance of patients over 45 years of age was observed. This trend could be attributed in part to age-related degenerative processes. The thyroid gland, like other tissues, undergoes structural and functional changes over the years. These degenerative changes can promote the development of nodules or other malignant pathologies. The cumulative impact of these alterations may contribute to an increased prevalence of thyroid cancer in older individuals.

In the present study, a clear female predominance was observed, with 70.2% and a sex ratio of 0.42. This is corroborated by various studies in the literature, such as that conducted by Leenhardt L *et al.* in France in 2010, which found a 75% female gender ratio [7]. The female gender ratio was 90.7% and 89.7% respectively for Allah OM in Morocco in 2008 [8] and Kaké A *et al.* in Guinea in 2020 [9]. A systematic review and meta-analysis published in 2016 examined the risk factors for thyroid cancer according to gender. They found that women had the most common and least aggressive type [10].

In this study, cervical swelling was the most common reason for consultation (94.7%), a finding consistent with other series from the literature. Similar observations have been reported in North African studies, notably by Touati MM *et al.* [11] in Morocco, where cervical mass was the predominant presenting symptom, and by Boujelben K *et al.* in Tunisia, who also reported neck swelling as the main mode of presentation in the majority of cases [12]. For Sidibe EH *et al.* in 2001, concerning thyroid cancers in Africa, cervical swelling was the most frequent clinical sign (90 to 100% of cases), associated or not with signs of compression or functional disorders [13]. The clinical signs of thyroid cancer are often nonspecific and may go unnoticed. The most common symptom is the presence of a cervical mass, usually located in the neck region.

In this series, the majority of nodules were fleshy or firm in appearance, consistent with findings from other studies where firm nodules were commonly observed and associated with malignancy risk [14] [15]. In the context of thyroid cancer, these nodules can have various appearances that can help establish the diagnosis and guide management. Certain macroscopic characteristics may already point to tumor lesions, allowing the nodule to be sampled properly in order to establish the diagnosis.

According to the histological analyses in this study, papillary carcinomas were the most common, accounting for 82.5% of cases. This is the most frequently encountered histological type in the thyroid, accounting for 80 to 93% of cases according to the International Agency for Research on Cancer (IARC) in 2025 [16]. This is corroborated by various series in the literature, such as Rakotoarisoa AH

et al. in Antananarivo in 2010 with 50% of cases [17], Zalzali M *et al.* in 2019 in the French cancer registry of Marnes Ardennes with 84.6% [18], Touatti MM *et al.* in 2015 in Marrakech with 90% of cases [11], Muzaffar M *et al.* in 1998 in Rawalpindi, Pakistan with 70.7% [19], and Boujelben K *et al.* in 2020 in Tunisia with 76.5% [12]. This could be explained by the fact that follicular cells represent 99% of the thyroid parenchyma and are the targets of various etiological factors of thyroid cancer, such as exposure to ionizing radiation during childhood and occupational risk factors such as working in the paper, rubber, plastics, wood, auto repair, and metallurgy [20].

In the present study, vesicular carcinoma accounted for 5.3% of cases. Similar results were reported by Touatti MM *et al.* in 2015 in Marrakech with 4% of cases [11] and Chaib G *et al.* in Algeria in 2020 with 9% of cases [21].

Anaplastic thyroid cancers represent the final form of dedifferentiation of follicular thyroid tumors and are one of the most aggressive cancers in humans. The results of this study found 7% of cases. According to Wemeau JL *et al.* in 2008, at the Lille University Hospital in France, it accounted for 1.6% of thyroid cancers each year [22]. Chiacchio S *et al.* in 2008 reported 2 to 5% of cases [23]. These carcinomas often emerge from differentiated carcinomas, such as papillary or follicular carcinomas, through specific mutations and environmental factors, which is relatively rare. These tumors are aggressive, grow rapidly, and often lead to late-stage diagnoses. Their invasive and metastatic behavior limits survival rates and explains their underdetection in epidemiological studies.

In this series, a predominance of cases at the pT3a stage (42.1%), corresponding to tumors larger than 4 cm confined to the thyroid gland, was observed. This distribution contrasts with most contemporary studies, in which early-stage tumors classified as pT1a and pT1b are predominant. In high-income countries, the widespread use of cervical ultrasonography has led to an increased detection of papillary thyroid microcarcinomas, which may account for up to 30% - 50% of diagnosed cases and are often identified incidentally [24] [25]. The predominance of pT3a tumors in our study may be explained by delayed diagnosis, with patients frequently presenting after the development of a clinically palpable cervical mass. Similar findings have been reported in studies from resource-limited settings, where limited access to early diagnostic tools contributes to the detection of thyroid cancers at a more advanced tumor stage [26]. These differences highlight the impact of healthcare context on initial tumor stage and help explain the discrepancy observed between our results and those reported in the literature.

5. Conclusion

Thyroid cancer is a tumor that develops in several forms and has distinct characteristics depending on its type and stage. This requires an accurate assessment for better management. This study highlights the importance of ultrasound and pathological examination as diagnostic tools of reference. For better management of thyroid cancer, it would be essential to carry out early screening for any swelling

or thyroid dysfunction, especially in women, and to expand knowledge on preventive and diagnostic measures, as well as to further investigate the factors that could lead to an increase in the prevalence of this disease.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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