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## Thyroid Cancer: Epidemiological Profile and Therapeutic Management

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**ABSTRACT:** Thyroid cancer is the most common endocrine malignancy, with an increasing incidence, particularly among women. This retrospective study, conducted over five years at CHU Ibn Rochd in Casablanca, analyzes the epidemiological, clinical, pathological, and therapeutic aspects of 48 histologically confirmed cases. The results highlight a significant female predominance, an average patient age of 49.94 years, and papillary carcinoma as the most common histological type. The majority of patients presented with an isolated cervical nodule, with ultrasound and fine-needle aspiration biopsy playing key roles in diagnosis. Total thyroidectomy was the preferred surgical approach, followed by radioactive iodine therapy and hormone replacement therapy. Postoperative complications were limited, with a favorable overall prognosis. Early detection and optimized therapeutic strategies remain essential for improving patient outcomes.

**KEYWORDS:** Thyroid Cancer, Papillary Carcinoma, Fine-Needle Aspiration Biopsy, Total Thyroidectomy, Radioactive Iodine Therapy.

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### INTRODUCTION

Thyroid cancer is the most common endocrine cancer (1). In Morocco, the estimated number of new cases diagnosed in 2020 was 2,311 (according to Globocan 2020 estimates) (2). Thyroid cancer is increasingly discovered incidentally, and its revelation through metastasis is less common. Advances in diagnostic modalities such as ultrasound and fine-needle aspiration biopsy have significantly increased the detection of cancerous nodules (3,4). Surgery remains the primary therapeutic approach, often combined with radiotherapy, radioactive iodine therapy (iodine-131), hormone therapy, and chemotherapy (5). Most thyroid cancers have a slow progression, are usually locoregionally confined, and have a favorable prognosis. However, some cases develop distant metastases, while others exhibit rapid progression (6). The management of thyroid cancer is multidisciplinary, involving the expertise of various specialists such as endocrinologists, surgeons, pathologists, nuclear medicine physicians, and oncologists. The objective of our study is to present the pathological, epidemiological, and therapeutic management characteristics of thyroid carcinomas in the General Surgery Department, Aile 1, at CHU Ibn Rochd in Casablanca.

### MATERIALS AND METHODS

This retrospective descriptive study was conducted over five years (January 2018 - December 2022) in the General Surgery Department, Aile 1, at CHU Ibn Rochd in Casablanca. It involved 48 patients with histologically confirmed thyroid cancer. The data were categorized into four groups: epidemiological, clinical, pathological, and therapeutic. The analysis was carried out using patient records, in collaboration with the pathology and endocrinology departments, while ensuring patient anonymity.

### RESULTS

#### Epidemiology

Among 178 thyroidectomies performed in the department between 2018 and 2022, the frequency of thyroid cancers among these procedures was 26.97%. A clear female predominance was observed, with 95.83% women and a female-to-male ratio of 23. The average patient age was 49.94 years (ranging from 26 to 80 years).

#### Diagnosis

In our series, we identified six cases of multinodular goiters. One patient was being treated for hypothyroidism with hormone therapy, and two cases involved hyperthyroidism managed with synthetic antithyroid drugs. One patient had a history of lobectomy. Regarding family history, six patients reported nodular goiter in relatives, two had a family history of thyroidectomy, and one had a first-degree relative with a thyroid disorder. The most common reason for consultation was the presence of an isolated cervical nodule (58.33% of cases). In 18.75% of cases, the diagnosis was made during follow-up for pre-existing goiters. Symptoms of

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compression (dysphagia, dyspnea, dysphonia) were present in 8.33% of patients. In 10.42% of cases, cancer was incidentally discovered through imaging. Upon clinical examination, a solitary thyroid nodule was found in 52.08% of cases. It was located in the right lobe in 56% of cases and in the left lobe in 44%. The average clinical nodule size was 2.5 cm (ranging from 1 to 5 cm). All nodules were painless and mobile in both superficial and deep planes. Their consistency was firm in 68% of cases and soft in 32%. Multinodular goiter was found in 41.67% of patients (fig 1). Only one case presented a suspicious cervical lymphadenopathy.

Thyroid function tests (TSH,  $\pm$ T4,  $\pm$ T3) revealed two cases of hyperthyroidism (4.17%), while 46 cases (95.83%) were euthyroid with normal TSH levels. Ultrasound was performed in all patients and revealed a variation in the number of nodules ranging from 1 to 10. The majority of nodules were bilateral (54.17%), followed by those located in the right lobe (27.08%) and the left lobe (18.75%). The average nodule size was 28.39 mm, ranging from 10 mm to 63 mm, with a predominance of nodules exceeding 20 mm. In terms of echogenicity, the nodules were predominantly hypoechoic (58.33%), followed by heterogeneous (20.83%), isoechoic (12.5%), and hyperechoic (4.17%). The echostructure was defined in 27.08% of cases, with a majority of mixed nodules (14.06%), followed by solid (4.69%) and cystic nodules (1.56%). The margins were regular in 75% of cases and irregular in 25%. The nodules were oval in 37.5% of cases, round in 14.58%, and undefined in 47.92%. Vascularization was assessed in 14.58% of patients, with a mixed pattern in 4.17%, peripheral in 2.08%, central in 4.17%, and absent in 4.17%. Microcalcifications were present in 20.31% of patients. A suspicious cervical lymphadenopathy measuring 6.5 mm was identified in one patient. According to the EU-TIRADS classification, the nodules were predominantly categorized as TIRADS 4 (47.92%), followed by TIRADS 5 (35.41%) and TIRADS 3 (16.67%). Fine-needle aspiration biopsy was performed in 17 patients (35.42%) and classified according to the 2017 Bethesda system. Among these samples, 5.88% were Bethesda 1, Bethesda 3 lesions accounted for 35.29%, and Bethesda 4 lesions represented 17.65%. A suspicion of malignancy (Bethesda 5) was found in 29.41% of cases, while 11.76% had confirmed malignancy (Bethesda 6). Thyroid scintigraphy was performed in three patients. It revealed a toxic multinodular goiter with a hot nodule in one case, a Graves' disease goiter with two large hypofixing nodules in another, and a multinodular goiter with a large hypofixing nodule in the third case. Additionally, a computed tomography (CT) scan was performed in one patient, revealing a substernal goiter.

### Pathology

The histological type was papillary carcinoma in all cases. Among these, 43.75% had the classical type, 47.92% had the follicular type, and 8.33% had the oncocytic type.

Capsular invasion was noted in 12 patients (25%), while the tumor was encapsulated in the remaining cases. Histological analysis showed locoregional extension in 30% of cases. Only one patient had nodal metastasis, and no cases of distant metastases were reported. The average tumor size was 2.3 cm (ranging from 0.1 to 7 cm). According to the pTNM classification, 29.16% of cases were pT1a, 22.91% were pT1b, 31.25% were pT2, and 16.66% were pT3a. Only one patient had lymph node involvement, and all patients were M0, with no metastases.

### Treatment

Total thyroidectomy was the most performed surgical procedure (87.5% of cases) (fig 2). Lobectomy followed by completion thyroidectomy was performed in four cases (8.33%), and completion of the remaining lobe was performed in two cases (4.17%). Patients who underwent total thyroidectomy were referred to the nuclear medicine department for radioactive iodine therapy.

Hormone replacement therapy was systematically initiated after surgery. Dosages ranged between 150 and 250  $\mu$ g. Regular monitoring allowed for dose adjustments based on TSH ultrasensitive (TSHus) levels.

Postoperative complications included transient hypocalcemia (6.25%), temporary recurrent laryngeal nerve palsy (6.25%), and one case of stridor, which improved with adrenaline nebulization. One patient died due to nosocomial infection following prolonged intubation, despite an attempt at spontaneous ventilation.



Figure 1 : Multinodular goiter.

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**Figure 2 : Operative specimen of a total thyroidectomy.**

### DISCUSSION

Our results align with international literature data. The clear female predominance and the average age at diagnosis are consistent with global epidemiological studies (7,8). Papillary carcinoma remains the most common type, generally associated with a favorable prognosis (5).

As in the literature, thyroid nodules are the most common mode of thyroid cancer presentation in our series (9). Careful cervical palpation is a crucial step in the clinical examination.

When faced with a thyroid nodule, the diagnostic strategy must determine thyroid functional status to identify possible thyroid dysfunctions. TSH measurement remains the gold standard (10).

Thyroid ultrasound is a crucial technique widely used for detecting and evaluating thyroid nodules. It is a non-invasive and cost-effective procedure that provides valuable information on nodule size, structure, and parenchymal alterations (11). The presence of specific ultrasound features can be predictive of malignancy.

Fine-needle aspiration biopsy is an essential technique for evaluating thyroid nodules. It is simple, quick, minimally invasive, and reliable, with a very low risk of complications. Its main advantage is the better selection of patients requiring surgical intervention based on the Bethesda classification (12).

Surgery is the primary treatment for thyroid cancer. It allows for histopathological examination, confirming the diagnosis (13). Total or near-total thyroidectomy is a favorable prognostic factor (4).

In the immediate postoperative period, a compressive hematoma accompanied by acute dyspnea may occur; this is a rare but serious complication that can be life-threatening. The two most common and specific complications following thyroidectomy for cancer are recurrent laryngeal nerve paralysis and hypoparathyroidism (14). In our series, the occurrence of these complications was well controlled without difficulties.

### CONCLUSION

Thyroid cancer is on the rise, particularly among women. Its diagnosis relies on imaging and histology. Early detection through ultrasound and fine-needle aspiration biopsy has improved management strategies. Surgery, combined with radioactive iodine therapy and hormone therapy, remains the standard treatment. Optimizing screening and therapeutic follow-up is crucial for improving patient prognosis.

#### Provenance and peer review

Not commissioned, externally peer reviewed.

#### Consent

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

#### Ethical approval

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

#### Conflicts interests

Authors have declared that no competing interests exist.

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