



Research Article

# Surgical Management of Differentiated Thyroid Carcinomas: Experience in a Low-Income Country

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## Abstract

**Objective:** To share our surgical experience in the management of differentiated thyroid carcinomas in a low-income country.

**Materials and Methods:** We performed a retrospective study in our department where 21 cases of differentiated thyroid carcinomas were recorded from February 2001 to December 2010.

**Results:** We performed 334 thyroidectomies for 326 patients. Of this group, 21 differentiated thyroid carcinomas were diagnosed. Differentiated thyroid carcinomas represented 6.4% of all thyroid neoplasm managed during the same period (n=326). Median age was 44 years (range 13 - 75 years). Male to female ratio was 1:20. Six (6) patients underwent primary hemithyroidectomy in other institutions while the fifteen left were entirely managed in our clinic. Of them, one patient was referred with positive fine needle aspiration cytology for papillary thyroid carcinoma (incidental detection by fine needle aspiration biopsy) and another had history of sinus pyriform fistula. Pathology of surgical specimens showed 13 cases of papillary thyroid carcinomas and 8 cases of follicular thyroid carcinomas with association to Hashimoto thyroiditis and Grave's disease in respectively in 1 case. Twenty cases were incidentally discovered by thyroid surgery and undergone completion thyroidectomy with prophylactic central neck dissection, completion thyroidectomy alone, modified lateral neck dissection alone and surveillance respectively in 13, 1, 1 and 6 cases. Complications of thyroid surgery were bilateral recurrent laryngeal nerve paralysis and hematoma respectively

in 1 case. Median hospital stay was 5 days ranged from 3 to 15 days. During the follow-up period, most of our patients were lost of follow-up.

**Conclusion:** Management guidelines of differentiated thyroid carcinomas are well established but not applicable to low-income country for several reasons. National guidelines, based on further researches, must then be implemented to improve our practice.

**Keywords:** Differentiated thyroid carcinoma; Thyroid; Thyroidectomy; Lobectomy; Papillary thyroid carcinoma; Follicular thyroid carcinoma; Central neck dissection

## Introduction

Differentiated thyroid cancers generally have a very good prognosis, with a 10-year survival rate greater than 90% [1]. A greater number of ultrasound scans and other imaging techniques along with an increase in the number of thyroidectomies for benign conditions and better histological examination of surgical specimens, have led to the diagnosis of papillary thyroid carcinoma cases with low clinical impact [2-5]. Surgical resection has remained the first choice for the treatment of differentiated thyroid cancer. Total/near-total thyroidectomy and thyroid lobectomy are the two most accepted options [6].

In this study, our aim was to share our surgical experience in the management of differentiated thyroid carcinoma in a low-income country like Senegal where guided fine needle aspiration biopsy is not routinely done, molecular tests and radioiodine therapy are recently available. The population of Senegal was estimated at 14. 548.000 inhabitants while gross domestic product per capita (current US\$) and gross national income per capita (current US\$) were respectively assessed to 1072 and 988.5 [7]. Of a household's health expenditures, 89% was out-of-pocket spending while 11% was in the form of health insurance contributions (8). Only 15.2% of the Senegalese population had health insurance, most of whom were private workers, civil servants or recipients of community-based health insurance [8].

## Material and Methods

We performed a retrospectively study in the ENT department of Hospital General de Grand-Yoff (HOGGY) of Dakar (Senegal, West-Africa) where 21 cases of differentiated thyroid carcinomas were recorded from February 2001 to December 2010.

## Inclusion criteria

1. Patients with differentiated thyroid carcinomas who underwent primary thyroid lobectomy for thyroid nodule in another institution and admitted in our department
2. Patient with true-positive fine needle aspiration cytology
3. Patients with differentiated thyroid carcinomas who underwent entire surgical management in our department

## Exclusion criteria

1. Patients with differentiated thyroid carcinomas who were not managed in our institution

2. Patients with other malignant thyroid tumors (undifferentiated thyroid carcinoma, medullar thyroid carcinoma, lymphoma)
3. Patients with suspected malignant thyroid tumors (without final pathology)
4. Patients with benign thyroid mass

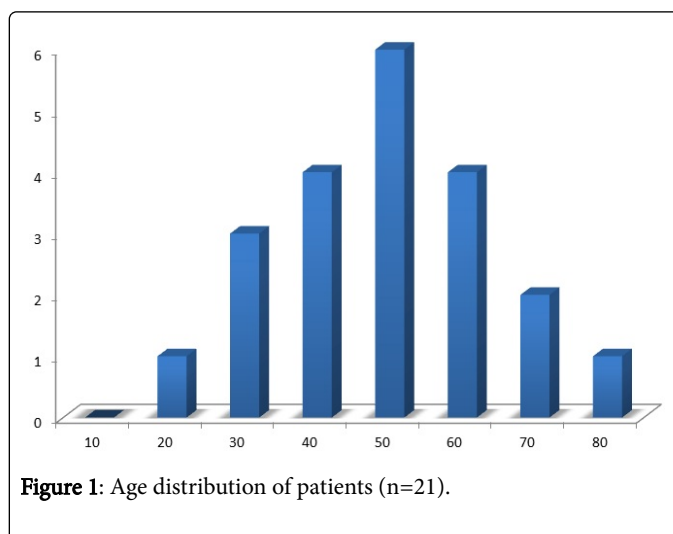
**Following parameters were recorded:** age, gender, clinical presentation, physical examination findings, thyroid function tests, thyroid ultrasonography, fine needle aspiration biopsy, surgical procedures and complications of thyroid surgery, hospital stay, and histologic findings, follow-up. Indirect laryngoscopy was systematically done (screening of vocal cord paralysis). Thyroid stimulating hormone and ultrasound scan was not systematically performed in order to reduce the amount of coverage. Thyroid scan was done according to radioiodine availability. Pathology was systematically done without molecular tests. On follow-up hormone replacement therapy coupled with thyroid stimulating hormone test, calcemia were mandatory. However most of the patients were lost follow-up.

Data were studied from medical report and analyzed through Excel software 2007.

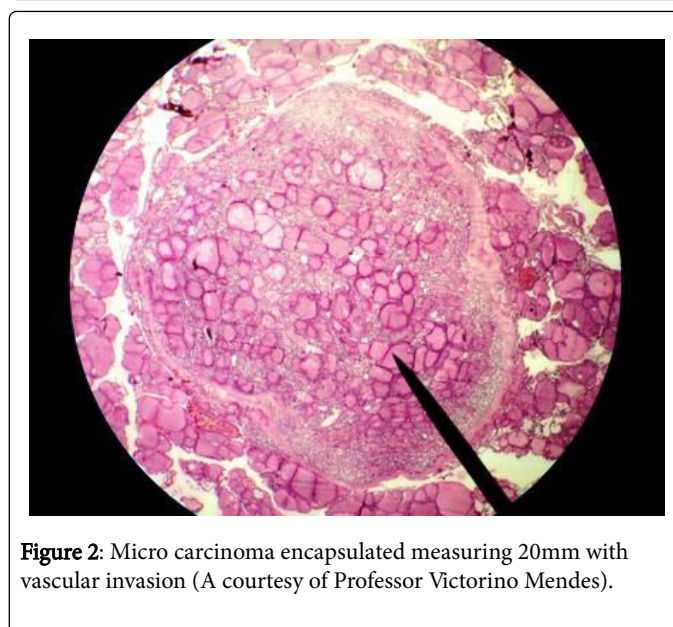
## Results

From February 1st 2001 to December 31st 2010, we performed 334 thyroidectomies for 326 patients. Of this group, 21 differentiated thyroid carcinomas were diagnosed. Differentiated thyroid carcinomas represented 6.4% of all thyroid neoplasm managed during the same period (n=326). Median age was 44 years (range 13-75 years) (Figure 1). Male to female ratio was 1:20. Six (6) patients underwent primary hemithyroidectomy but, only 3 of them had histological results of differentiated thyroid carcinomas (incidental detection by thyroidectomy). On follow-up, the three others developed thyroid carcinoma in residual lobe. No previous radiant treatment was found at history. Neck mass was the chief complaint in 16 of 21 patients (16/21 cases). Three (3) patients complained from compression signs like dysphonia (2/21 cases) and dysphagia (1/21 cases). Only one patient had painful neck swelling at clinical presentation (1/21 cases). One patient was complaining from sinus pyriform fistula. Incidental detection by fine needle biopsy occurred in one case of positive cytology (1/21 cases). History of Grave's disease and Type 1 diabetes were respectively present in one case (1/21 cases). Physical examination found 6 cases of goiter, 15 cases of thyroid nodule, no lymph node was palpated. Indirect laryngoscopy revealed vocal cord paralysis after primary hemithyroidectomy in 2 cases (2/21 cases). Thyroid stimulating hormone (TSH) was assessed in 8 cases with normal levels in 7 cases and one case of decreased levels (hyperthyroidism) (1/21 cases). Preoperative thyroid ultrasonography was done in 7 cases (7/21 cases) and showed single thyroid nodule and multinodular thyroid gland respectively in 3 and 4 patients. No neck node was identified by ultrasound scan (7/21 cases). Scintigraphy was performed in one case (1/21 cases) and revealed a cold nodule. Fine needle aspiration biopsy was done in one case (1/21 cases) and cytologic diagnosis was papillary thyroid carcinoma. Pathology of surgical specimens showed 13 cases of papillary thyroid carcinoma (13/21 cases) (Figure 2), 8 cases of follicular thyroid carcinoma (8/21 cases) with association to Hashimoto thyroiditis and Grave's disease in respectively in one case (1/21 cases). Surgical management was made without fine needle aspiration biopsy in 20 cases and required second thyroid surgery (14/21 cases) or surveillance (6/21 cases) (Table 1). After second thyroid surgery (completion thyroidectomy and or prophylactic central neck dissection), pathology also found pharyngeal

invasion and lymph node invasion (5N+ /11) in respectively 1 case (1/21 case). In the case with positive fine needle aspiration cytology, the patient underwent total thyroidectomy with prophylactic central neck dissection (aggressive approach). Other surgical procedures were also performed like tracheostomy and suture lateralization respectively in 3 and 1 cases. Indications of tracheostomy were intubation for compressive goiter, postoperative hematoma and bilateral recurrent laryngeal nerve paralysis. Suture lateralization was done for management of bilateral recurrent laryngeal nerve paralysis. Complications of thyroid surgery were bilateral recurrent laryngeal nerve paralysis and hematoma respectively in one case (1 case). Median hospital stay was 5 days ranged from 3 to 15 days. On follow-up, most of our patients were lost of follow-up.



**Figure 1:** Age distribution of patients (n=21).



**Figure 2:** Micro carcinoma encapsulated measuring 20mm with vascular invasion (A courtesy of Professor Victorino Mendes).

Diagnosis	Surgical procedures	Total
Goiter	Total Thyroidectomy	6
Thyroid nodule	Hemithyroidectomy with isthmusectomy	8

Sinus Piriform Fistula	Hemythyroidectomy with isthmusectomy and Fistulectomy	1
Differentiated thyroid carcinoma	Completion thyroidectomy with prophylactic central neck dissection	13
	Completion thyroidectomy alone	1
	Lateral neck dissection alone	1

**Table 1:** Surgical management of patients.

## Discussion

Thyroid cancer is uncommon, accounting for roughly 1% of all new malignant disease [9]. The large majority of these malignancies are represented by differentiated thyroid carcinomas, such as papillary and follicular types [10]. Differentiated thyroid cancer account for the vast majority (90%) of all thyroid cancers [11]. In our study, 21 cases of differentiated thyroid carcinomas were recorded during a 10-year period and represented 6.4% of thyroid tumors. In general, thyroid cancer is more prevalent in the middle-aged or old and in females [11]. Media age was 44 years; M/F ratio was 1/20 with a 13 -year child in our study (1/21 cases). Clinical risk factors for thyroid carcinoma such as age, gender were found in our series. The initial complaint was a palpable cervical mass, the most common presentation form described [12]. In our work, all the patients presented a palpable thyroid mass (6 goiters, 15 nodules) and the diagnosis of differentiated thyroid carcinomas was an incidental detection by thyroid surgery (20/21 cases). Only one patient had incidental detection by fine needle aspiration biopsy and was referred for surgical management. Ultrasonography was performed in 7 cases but found no suspected malignant characteristics while scintigraphy performed once revealed a cold nodule. Clinical features (i.e. male gender, hard and firm neck lesion, previous neck radiant treatment), nodule's ultrasound presentation (i.e. solid nodule with irregular margin and micro calcifications), and scintigraphy (i.e. cold nodule) are traditionally considered as risk factors for thyroid malignancy [13-15]. Diabetes and thyroid disorders have been shown to mutually influence each other and associations between both conditions have long been reported [16]. In our study, an association of diabetes and thyroid carcinoma was noted. Like diabetes, Hashimoto's thyroiditis is an autoimmune disorder characterized by inflammation of the thyroid gland. The links between inflammation of the thyroid epithelium and thyroid cancer have already been suggested [17,18]. In our study, pathological findings showed a case of association of papillary thyroid carcinoma and Hashimoto's thyroiditis. Association of Grave's disease and thyroid carcinoma is also reported in the literature [19,20]. Our work showed also a case of an association of both thyroid disorders. Cure of sinus pyriform is achieved only by complete resection of the sinus tract, including that portion of the thyroid where the sinus tract terminates [21,22]. In our study, fistulectomy with lobectomy for sinus pyriform fistula led us to diagnose associated differentiated thyroid carcinoma (incidental detection by cure of sinus pyriform fistula). Preoperative indirect laryngoscopy assessed vocal cord mobility. In our study, a case of unilateral vocal cord paralysis was diagnosed in a patient with history of thyroid surgery that revealed a differentiated thyroid carcinoma. During completion thyroidectomy, involvement of recurrent laryngeal nerve was noticed and led us to extent resection. Bilateral vocal paralysis was managed by transient tracheostomy and suture lateralization subsequently. Complications of thyroid surgery are well known among them recurrent laryngeal nerve palsy and

hematoma. In our study, hematoma occurred in one case and required urgent tracheostomy.

In our practice, thyroid surgery was the corner stone of our treatment (diagnostic and therapeutic) and allowed us to discover thyroid carcinoma (20/21 cases). In this study, papillary thyroid carcinoma was most frequently found (13/21 cases) while follicular thyroid carcinoma represented (8/21 cases). Papillary thyroid carcinoma is the most common type [23,24]. After second thyroid surgery and or prophylactic central neck dissection, all patients were followed up. However most of the patients were lost of follow-up even the case of pharyngeal invasion.

Management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer are well established by the American Thyroid Association [25]. Our hard conditions of practice were marked by the absence of universal health coverage for patients and lack of molecular tests and the important loss of follow-up. It seemed that a pragmatic and aggressive surgical approach was required: completion thyroidectomy and/or prophylactic central neck dissection. Our recommendations for detection of differentiated thyroid carcinomas in low-income country are based on preoperative ultrasonography (to find suspected malignant characteristics of thyroid nodules and lymphadenopathies) and guided fine needle aspiration biopsy (to find suspicious and positive cases). However, further researches are useful to establish our recommendations and to help building national management guidelines to improve our practice.

## Conclusion

Differentiated thyroid carcinoma is a rare malignant disease. Papillary thyroid carcinoma is more frequent than follicular type. Management guidelines of differentiated thyroid are well established but are not applicable to low-incomes country for several reasons. National guidelines, based on further researches, must then be implemented to improve our practice.

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