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Thyroid Cancers and Airway Management in Nigeria

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Abstract
BACKGROUND: *The incidence of thyroid cancers across Africa is increasing with emerging new histological variants. Involvement of the airway by the disease poses a great challenge to the managing surgeons.*
OBJECTIVES: *To report on the clinic-pathological profile of thyroid cancers and challenges of airway management.*
METHODOLOGY: *This is a 10-year retrospective review of 196 histologically diagnosed cases of Thyroid cancers managed at the University College Hospital (UCH) Ibadan, Nigeria. The clinical information obtained from the Cancer Registry and patients' medical records of the hospital included Age, Sex, clinical presentation, histological diagnosis and airway management. Data was collated and analysed using SPSS version 20*
RESULTS: *There were 196 cases – 66(33.67%) males and 130(66.23%) females whose ages ranged from 8 – 89 years. Anterior neck swelling was seen in all patients. Other symptoms were hoarseness ± dyspnoea in 79(40.31%) with evidence of vocal fold paralysis on pre-operative laryngoscopy. Papillary cancer accounted for 120 (61.22%), follicular variant was 48(24.49%), oxyphilic variant was 4(2.04%), medullary variant was 13(6.60%), anaplastic variant was 3(1.53%), Adenocarcinoma variant was 2(1.02%), Insular variant was 1(0.51%) and malignant Teratoma variant was 1(0.51%). Five (2.55%) patients had preoperative tracheostomy while 19 (9.69%) had postoperative tracheostomy.*
CONCLUSION: *Improved immunohistochemical staining and adequate airway care are central in the management of thyroid cancers.*

Keyword: ***Thyroid cancer, histological variants, airway, laryngoscopy***

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I. Introduction

Thyroid gland cancers can originate from any of the cellular components of the gland. These include the follicular cells, parafollicular cells, lymphoid cells and stromal cells. However, most malignant thyroid tumours are of follicular cell origin [1,2,3] .

Needless to say that the other types that are not of follicular cell origin are rare. Follicular cell neoplasms can be classified into three major categories: papillary, follicular and anaplastic (undifferentiated). Medullary carcinoma is the only known neoplasm of parafollicular cell origin[2] .

Lymphomas are uncommon and are believed to arise within lymphocytic thyroiditis (mediated by autoimmunity). Squamous cell carcinoma of the thyroid gland is rare. Most cases arise mainly from direct spread by continuity and contiguity from carcinomas of either the larynx or post- cricoid region[4]. Secondary malignant thyroid tumours could arise from larynx, lung, pharynx, oesophagus, breast, colon and kidney [4,5,6.]

Several publications on thyroid cancers have not addressed the pre-operative laryngoscopic findings and the challenges encountered in the management of the upper airway in such patients; hence the relevance of this study.

AIM AND OBJECTIVE

The objective of the paper is stated as follows:
To report on the clinic-pathological profile of thyroid cancers and challenges of airway management in a Tertiary Health institution.

II. Material And Method

This is a 10-year retrospective review (1999 – 2008) of 196 histologically diagnosed cases of Thyroid cancers managed at the University College Hospital (UCH) Ibadan, Nigeria. The data was applied for and the raw data was stratified

The clinical information obtained from the Cancer Registry were synchronised with the patients' medical records to underscore the clinical information on each patient.

Relevant data obtained included: Age, sex, clinical presentation, histological diagnosis, pre-operative laryngoscopic findings in all the patients, post-operative laryngoscopic findings in patients with post-operative airway compromise and the subsequent airway management options in patients with obstructive vocal cord paralysis. Data was collated and analysed using Statistical Package for the Social Sciences **(**SPSS) version 20. Results were presented in tables and charts.

III. Results

There were 196 cases – 66(33.67%) males and 130(66.23%) females. This represents M: F ratio of 1:2. The ages ranged from 8 to 89 years. Peak age of incidence was 3^{rd}-6^{th} decade of life. Mean ± SD = 41.38 ± 16.02 years.

Anterior neck swelling was seen in all patients. Other symptoms were hoarseness ± dyspnoea in 79(40.31%) with evidence of vocal fold paralysis on pre-operative laryngoscopy. Papillary cancer accounted for 120 (61.22%), follicular 48(24.49%), oxyphilic 4(2.04%), medullary 13(6.60%), anaplastic 3(1.53%), Adenocarcinoma 2(1.02%), Insular 1(0.51%), Lymphoma 2(1.02) and Malignant Teratoma 1(0.51%). Five (2.55%) patients had preoperative tracheostomy while 19 (9.69%) had postoperative tracheostomy. Table 1 shows the variants of histologically diagnosed thyroid cancer. Table 2 shows the age distribution of patients with thyroid cancer. The peak age of incidence is 3^{rd} to the 6^{th} decade of life.

Figure 1 shows that less than half of the patients with papillary carcinoma of the thyroid gland had vocal cord palsy on laryngoscopy while majority of the patients with follicular carcinoma presented with vocal cord palsy. All the patients that had anaplastic carcinoma and lymphoma presented with vocal cord palsy.

Rapid progression of anaplastic and lymphoma variants may account for vocal cord paralysis seen in patients at first presentation in the clinic. Figure 2 shows that the peak age of incidence was the 3^{rd} to 6^{th} decade of life. Figure 3 shows that all the patients with papillary and follicular carcinoma that merited tracheostomy had it post-operatively; while those with anaplastic and lymphoma varieties had tracheostomy on emergency pre-operatively.

TABLE 1: HISTOLOGICAL VARIETIES

HISTOLOGICAL VARIETIES	NUMBER %
Papillary	120(61.93)
Follicular	48(24.37)
Medullary	13(6.60)
Anaplastic	3(1.52)
Lymphoma	2(1.02)
Malignant teratoma	1(0.51)
Oxyphilic	4(2.04)
Insular	1(0.51)
Adenocarcinoma	2(1.02)

TABLE 2: AGE DISTRIBUTION

Age	NUMBER	%
1-10	5	2.55
11-20	4	2.04
21-30	49	25.00
31-40	47	23.98
41-50	25	12.76
51-60	31	15.82
61-70	23	11.73
71-80	11	5.61
81-90	1	0.51

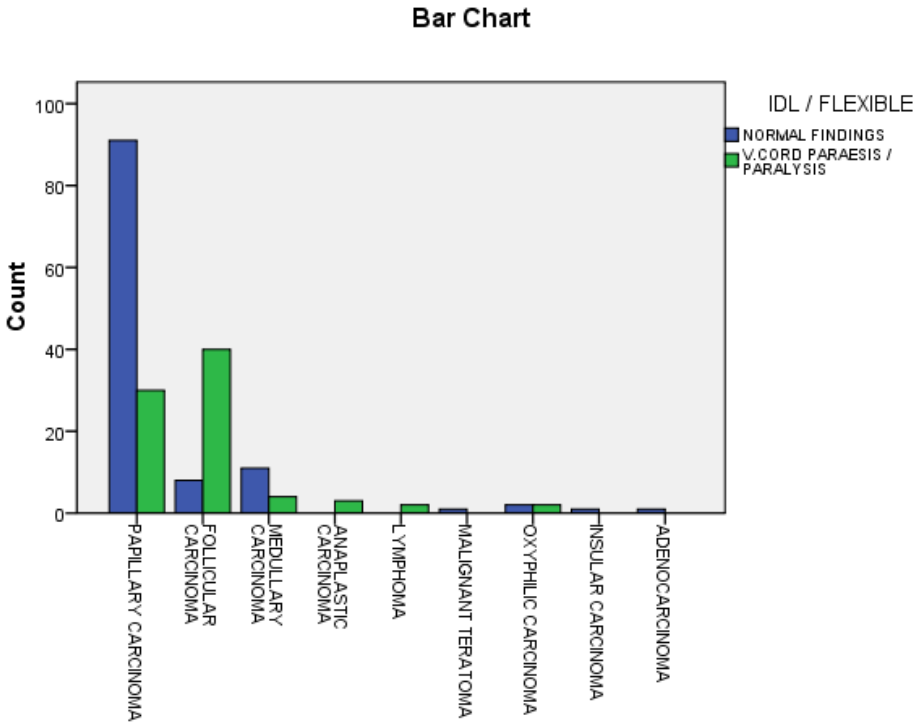

Fig 1: Histological types and the state of the vocal cords

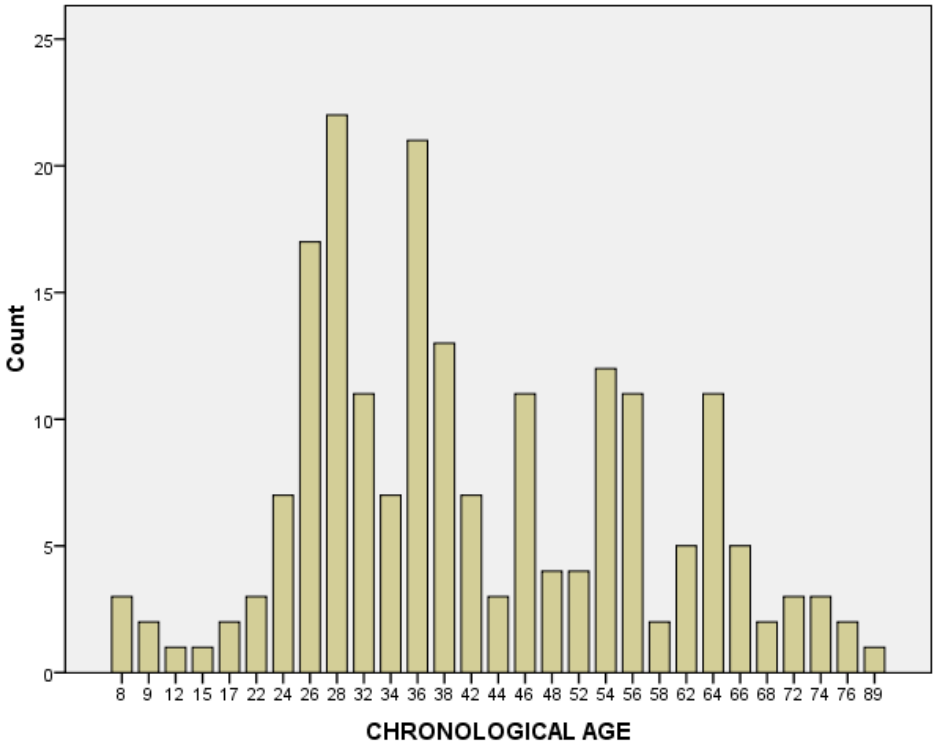

Figure 2: Age of patients in years

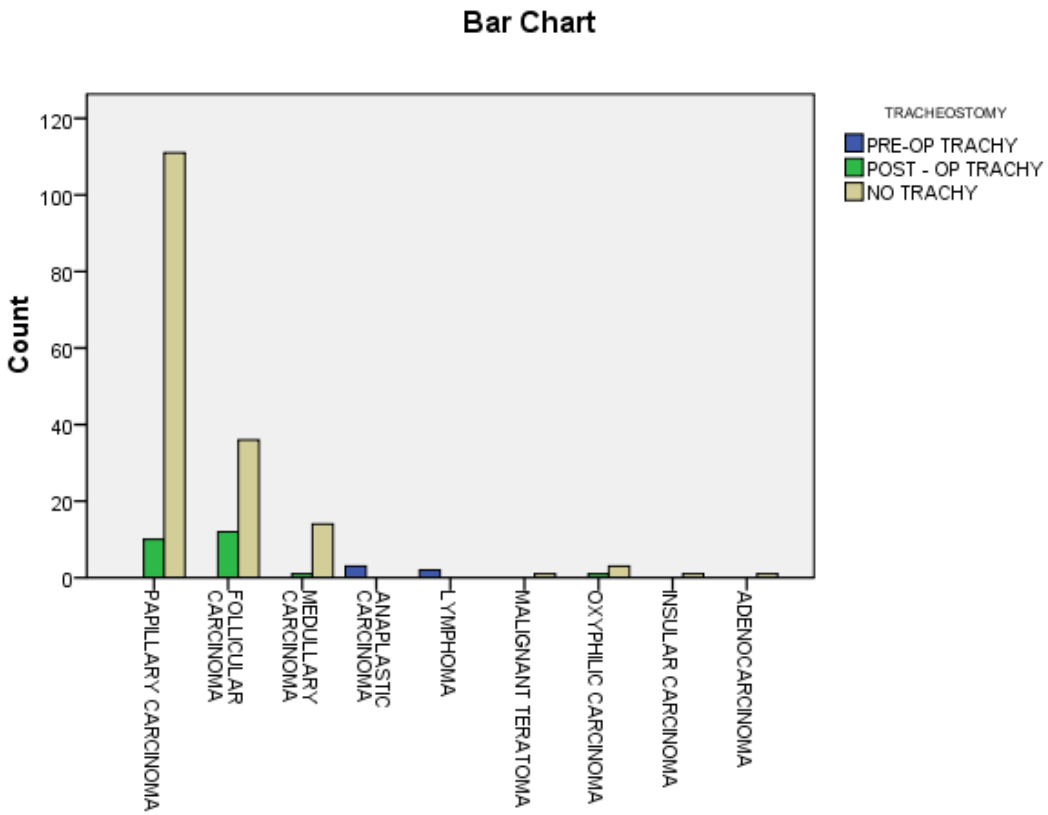

Fig 3: Tracheostomy requiring patients with diagnosis of follicular and papillary carcinoma

IV. Discussion

Malignant tumours of the thyroid gland represent less than 0.5% of all cancers in England and Wales[7,9]. In the UK, the annual incidence is about 3 per 100,000 of the population. It is estimated that about 1000 new cases per year are seen[3]. Thyroid cancers account for 1% of cancers diagnosed in US. American cancer society estimates 37,200 new cases in 2009.Seventy-three per cent were females while 27% were males. Of these, 940 females and 690 males would have died of thyroid cancer in 2009[13]

Thyroid cancer is the commonest endocrine malignancy, constituting 1.9% of all new cancerous tumours diagnosed annually in the United States. A ratio of F ; M was put at 3:1.

Recent study shows an increase in thyroid cancer incidence from 71 per million in 2000 to 176 per million in 2013. The increase in incidence is hinged on overdiagnosis, access to health care, environmental, dietary and genetic influences[14]

Thyroid cancers in Ibadan, Nigeria over a 20- year period (1965-1984) were reported as papillary (45.3%), follicular (44.5%), medullary (7%) and anaplastic (3%)[4]

In Maiduguri, Nigeria, a 10- year prospective study of thyroid nodules using fine needle aspiration cytology (FNAC), yielded follicular (55.5%), papillary (16.6%), medullary (16.6%) and anaplastic (4.2%). The study reported 26.1% of 69 patients as having thyroid malignancy.[4,5]

In a review article on impact of iodination on thyroid pathology in Africa, follicular carcinoma is reported as the predominant histology variety in Africa, suggesting persisting iodine deficiency in the continent[5].

In our study, nine (9) histological types were recognised due to improved staining techniques. This leads to improved treatment modalities with resultant better prognosis. The variants are as discussed:

1. *Papillary Carcinoma*

Papillary carcinoma accounts for 61.93% of all thyroid cancers in this study. It may be familiar in up to 5% of patients [4]. Most patients presents between the ages 21-60 years. The tumour is often more aggressive in elderly patients. Many papillary carcinomas contain follicular elements. The tumour spreads via lymphatics to

regional lymph nodes and may metastasize to the lungs[1], [2, 13] Papillary carcinoma is said to be the commonest variant responsible for the increase in incidence of Thyroid carcinoma in the United States.

Treatment is by total thyroidectomy with post-operative radio-iodine ablation of residual thyroid tissue with I-131 administered when the patient is hypothyroid or after recombinant TSH injection. L-thyroxine is given after treatment and serum thyroglobulin levels help detect recurrent or persistent disease [1, 3,9]

2. *Follicular Carcinoma*

It accounts for 24.37% in this study. The tumour is more common among older patients and in regions of iodine deficiency. It is more malignant than papillary carcinoma, spreading haematogenously with distant metastases[2,4]
Treatment- As for papillary carcinoma. Metastases are more responsive to radioiodine therapy than are those of papillary carcinoma[1,3]

3. *Medullary Carcinoma*

Medullary (solid) carcinoma constitutes 6.6% of thyroid cancers in this study; composing of parafollicullar cells (c cells) that produce calcitonin. It may be sporadic, however it is familial; caused by a mutation of the ret proto-oncogene. The familial form may occur in isolation or as a component of Multiple Endocrine Neoplasia (MEN) syndromes types 11A and 11B. Metastasis spread via lymphatic system. Elevated serum calcitonin is diagnostic. Genetic testing is advised in patients with medullary carcinoma.[4,5]
Treatment: Pheochromocytoma, if present is usually bilateral and should be removed before total thyroidectomy. Relatives with an elevated calcitonin without a palpable thyroid abnormality should undergo total thyroidectomy[4,8,5,9].

4. *Anaplastic Carcinoma*

It is an undifferentiated cancer that accounts for 1.52% in this study. It occurs mostly in elderly patients and slightly more often in women. The tumour is characterized by rapid painful enlargement. Rapid enlargement of the thyroid may also suggest thyroid lymphoma; particularly if found in association with Hashimoto thyroiditis [2,4, 5].
Treatment: No effective therapy exists and the disease is generally fatal. In a few patients with smaller tumours, total thyroidectomy followed by external radiation has been curative. Chemotherapy is mainly experimental [4,13]

5. *Thyroid Lymphoma*

Most are of Non Hodgkin lymphoma variety but occasionally, Hodgkin lymphoma may arise from the thyroid gland. Thyroid lymphoma is a rare type of extranodal lymphoma. It is usually a disease of B- cells. Thyroid lymphoma can be low or high grade. Mucosa associated lymphoid tissue (MALT) lymphomas tend to be low grade while diffuse large B-cell lymphomas are high grade. Sometimes, low grade lymphomas can change to high grade one. Thyroid lymphoma may begin as a lump ab-initio or following a history of Hashimoto's thyroiditis. Metastasis is to regional lymph nodes and bone marrow. However, MALT type can involve the digestive tract [10, 11, 12].
Treatment: Low grade lymphoma is treated with radiotherapy alone. It may be followed by total thyroidectomy. High grade is treated with a short course of chemotherapy (3-4 cycles), followed by radiotherapy. If the disease has spread beyond the thyroid gland, 6 cycles of chemotherapy are usually given [11, 12].

6. *Insular Carcinoma*

It is a histologically distinct subset of thyroid carcinoma whose classification falls between well differentiated and anaplastic carcinomas with respect to both cell differentiation and clinical behaviour. This fact has both prognostic and therapeutic significance. It warrants aggressive management with total thyroidectomy followed by radioactive iodine ablation of any remaining thyroid tissue.[5,13]

7. *Malignant Teratoma*

This is derived from the 3 primordial germ layers. The dominant portion of the tumour is composed of numerous masses of cancerous epithelial cells which are distributed randomly in the mesenchymal tissue.
Treatment: Total thyroidectomy and external irradiation[5, 9].

8. *Adenocarcinoma*

This is said to occur when neoplastic thyroid tissue is associated with functioning distant metastasis capable of producing clinical hyperthyroidism.[1, 5]

Treatment: Treatment is initial medical management to render the patient euthyroid before total thyroidectomy followed by radioiodine ablation [1, 9].

9. *Oxyphilic Carcinoma*

It is a rare tumour characterized by the presence of Hurthle cells- mitochondrion-rich, eosinophilic epithelial cells. Hurthle cell carcinoma of the thyroid behaves in a more aggressive fashion as compared to other well differentiated thyroid cancers. Recent classification defined Hurthle cell cancer as being composed of at least 75% Hurthle cells with associated capsular or vascular invasion or the presence of metastatic disease.
Treatment: Total thyroidectomy with post-operative radioiodine ablation [5, 6, 7, 8]

V. Conclusion:

The emergence of newer histological variants compared to previous findings in our environment is an indication of advancing knowledge in histological profiling of malignant thyroid disease.

A better histological profiling of cancer anywhere in the body is a positive prognostic factor with resultant better outcome in patients' care.

Prompt airway management in patients with obstructive vocal cord paralysis invariably paves way for increased survivability in affected patients at least in the short term as it allows for safe post- operative non surgical care of such patients without a life threatening airway compromise in the course of the treatment.

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