Thyroid Carcinoma in Black Patients

Edward L. Mosley, MD, E. B. Chung, MD, PhD, Norman Rogers, MD, Javan E. Anderson, MD, and Jack E. White, MD
Washington, DC

From 680 surgical specimens of thyroid disease, 31 cases of thyroid carcinoma found at Howard University Hospital, from January 1950 to December 1975, are reviewed. Eighteen (58 percent) were females and 13 (42 percent) were males. Of the 31 patients, there were 11 patients with follicular carcinoma, 11 with papillary carcinoma, seven with mixed papillary and follicular carcinoma, one with Hurthle cell carcinoma, and one with medullary carcinoma. Thyroid carcinoma accounts for only .001 percent of all admissions during the period of study, and is indeed a rare cause of disease among blacks at this institution. Recommendations for surgery and follow-up data are presented.

Thyroid carcinoma is one of the most interesting and unusual diseases to afflict man. The treatment of this disease suggests that the customary surgical and medical approaches to a metastasizing carcinoma may not apply to thyroid carcinoma. Because of its unusual natural history, variations in its behavior and differing responses to treatment, its importance is not proportional to its incidence. This retrospective study represents a desire to aid in the formulation of a rational treatment plan and to review recent advances in medical and surgical management of thyroid carcinoma.

Materials and Methods

From 680 surgical specimens of thyroid disease, 31 cases of thyroid carcinoma at Howard University Hospital from January 1950 to December 1975 were found and reviewed. The diagnosis was based on well-recognized histological data and all specimens were reviewed by one of the authors. Hematoxylin and eosin-stained sections were used, and in selected cases, the following special techniques were employed: Snook-reticulum and Masson trichrome stains, periodic acid-Schiff preparations with and without diastase digestion, and crystal violet and Congo-red stains.

Discussion

Among the 31 patients with carcinoma of the thyroid, 18 were females (58.1 percent) and 13 were males (41.9 percent) (Table 1). There were 11 patients with follicular carcinoma, 11 with papillary carcinoma, seven with mixed papillary and follicular carcinoma, one with Hurthle cell carcinoma, and one with medullary carcinoma. Patients' ages ranged from 18 to 75 years. The overall mean age at diagnosis was 37.4 years.

The mean age for follicular carcinoma was 39.6 years, for papillary carcinoma 45.2 years, and for mixed carcinoma 31.3 years. The age group with the greatest number of patients, regardless of type, was the 20-29 years group, 35.4 percent (Table 1). Follicular carcinomas occurred in four males (36.3 percent of males) and seven females (38.8 percent of females).

Papillary carcinomas occurred in seven males (63.6 percent of males) and four females (22.1 percent of females). Mixed carcinoma occurred in two males (18.1 percent) and five females (27.7 percent). Presenting symptoms are summarized in Table 2.

The hip pain in one patient was due to metastasis from follicular thyroid carcinoma. Biopsy of the bone metastasis led to the discovery of the primary tumor in the thyroid (Table 2).

Diarrhea was attributed to increased secretions of prostaglandins by the medullary carcinoma (Table 2). Prostaglandins have been shown to increase intestinal motility.

One patient was evaluated for chronic renal failure and secondary hyperparathyroidism (Table 2). The patient had subsequent subtotal parathyroidectomy and biopsy of a suspicious area of the thyroid which was found to contain follicular carcinoma.

Presenting complaints could not be obtained in five patients.

There were approximately 275,000 admissions to Howard University Hospital (formerly Freedmen's Hospital) during the period of study. Over the 26-year period, there were 110,891 surgical specimens, of which 680 cases of thyroid disease were found (0.6 percent of routine surgicals).[1] All patients in this study were black. Carcinomas were classified as papillary, mixed papillary and follicular, follicular, Hurthle cell, and medullary. There were no anaplastic carcinomas in this study. It is, however, generally believed that so-called mixed papillary and follicular carcinomas are biologically the same as "pure" papillary carcinoma and some authors do not separate them. Thus, thyroid carcinoma accounted for only .001 percent of all admissions during the period of study, and is indeed a rare cause of disease among blacks at this institution. Malignant disease of the thyroid gland is infrequent.[1,2] The clinical diagnosis of thyroid carcinoma in the absence of metastasis is difficult.[3] Carcinoma of

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Table 1. Age and Sex Distribution of Black Patients with Carcinoma of Thyroid (Howard University Hospital)

Age Group (yr)	Carcinoma Male	Female	Total
0-9	—	—	—
10-19	—	1	1
20-29	7	4	11
30-39	2	3	5
40-49	—	5	5
50-59	2	1	3
60-69	2	3	5
70-	—	1	1
Total	13	18	31
Percent	41.9	58.1	100.0

Table 2. Presenting Symptoms of Patients with Carcinoma of Thyroid (Howard University Hospital)

Symptom	Number of Patients	Percentage
Asymptomatic neck mass	9	34.6
Neck mass	5	19.2
Neck pain	3	11.5
Dyspnea	2	7.6
Hoarseness	2	7.6
Nervousness	1	3.8
Hip pain	1	3.8
Diarrhea	1	3.8
Renal failure	1	3.8

the thyroid (usually unsuspected clinically) has been found in 0.08-1.8 percent[4] to 2.8 percent of unselected necropsy cases.[4] In multinodular thyroids, its incidence ranges from 5.3[3]-7.2[4] up to 15 percent,[6] whereas in solitary nodules it varies from 9.2 percent up to 28 percent. Malignancy occurred in struma lymphomatosa (Hashimoto disease) in from 3 to 12 percent of cases.[7] In our series, 22 percent of the cases were associated with other pathology (Table 4). Hyperthyroidism has been reported to occur in 2.5 percent of thyroid carcinoma.[8] One patient had hyperthyroidism with associated carcinomas (3.2 percent).

These figures are, indeed, at great variance with the less than one percent incidence calculated for all nodular thyroid glands in the general population.[8] The incidence of carcinoma in surgically removed thyroid glands has been reported at between 18.9 and 19.9 percent.[6] White and non-white women share the same risk of thyroid carcinoma. In both races, women are affected more frequently than males. The ratio of male to female patients is about 1 to 3.[10]

In this series, the incidence of thyroid carcinoma was 4.6 percent of all surgically removed thyroids and the male-to-female ratio of thyroid carcinoma patients was 1 to 1.4. This appears to support the impression that there has been a significantly increasing incidence of the male patient with thyroid carcinoma and this trend seems to be accelerating. In four decades, the male to female ratio has changed from 1:4 to 1:2.[11] In this series, papillary carcinoma occurred in 63.6 percent of males, and in only 22.1 percent of females. Follicular carcinoma occurred more often in female patients, 38.8 percent.

Up-to-date follow-up information was obtained in 26 of the 31 patients (83.8 percent). Four of the 31 patients are dead (12.9 percent). One death was due to congestive heart failure and felt not to be related to thyroid disease. Three (9.6 percent) died of pulmonary insufficiency due to lung metastasis. All three had capsular invasion. Two were papillary (one poorly differentiated and one moderately differentiated) and one was follicular (poorly differentiated). None of the three had blood vessel invasion that could be identified. No nodes on the patient with follicular carcinoma were submitted from surgery.

One out of ten nodes was positive in one patient with papillary carcinoma and six out of 11 nodes were positive in the other patient with papillary carcinoma (Table 5).

The patient with follicular carcinoma had total thyroidectomy. This patient lived 15 years post surgery. The two patients who died of papillary carcinoma had standard radical neck dissections. One had 95 percent thyroidectomy, in addition to neck dissection, and lived five months post surgery. The other had total thyroidectomy, in addition to neck dissection, and lived six months post surgery. All of the patients who died of disease had had I^{131} therapy.

Age at diagnosis and primary treatment appears to be a crucial factor in results of treatment.[10] Of the patients who died with thyroid carcinoma, 66.6 percent were 63 years or older at the time of diagnosis. None of the patients who died of the disease had definite blood vessel invasion. Thus, in this series, this was a very poor guide to prognosis.

It has been suggested in other series[10] that lymph node metastases in papillary, follicular, and mixed thyroid cancer do not prejudice survival as is the general rule in other carcinomas. In one series, patients with pathologically confirmed lymph-node metastases had a lower mortality rate than those without nodal metastases in every category analyzed. In the group with extraglandular disease and the highest potential mortality, the survival advantage of those with nodal metastases was significantly better statistically and generally improved as more nodes were involved. Most striking of all was that no patients with ten or more nodes involved with metastases died.[10] In our series, all of the patients that died of disease had less than ten positive nodes.

Prognosis in children and young adults, who tend to have small primary tumors and extensive nodal metastasis, is much better than that in patients over the age of 40, who tend to have bulky tumors and few nodes involved. Lymph node metastasis in thyroid carcinoma illustrates the difficulty in analyzing the role of lymphatic metastases and lymph node resection.

Table 3. Surgical Treatment of Patients with Thyroid Carcinoma (Howard University Hospital)

Procedure	Number of Patients	Percentage
Total thyroidectomy	10	32.2
Subtotal thyroidectomy	10	22.5
Lobectomy	4	12.9
Lobectomy and isthmectomy	3	9.6
Total thyroidectomy and standard radical neck dissection	2	6.4
Bilateral subtotal thyroidectomy and Isthumustectomy	2	6.4
Subtotal lobectomy	2	6.4
Thyroidectomy and standard radical neck dissection	1	95

Table 4. Associated Thyroid Diseases in Patients with Thyroid Carcinoma (Howard University Hospital)

Associated Disease	Patients	Percentage
Hyperplasia	3	9.6
Nodular goiter	2	6.4
Hashimoto disease	1	3.2
Follicular adenoma	1	3.2
Total	7	22

Mediastinal lymph nodes are one of the principal drainage routes of the thyroid gland and may be assumed to harbor occult lymph-node metastases, yet they are seldom resected despite the zeal to remove the upper jugular chain of lymph nodes which lie considerably farther from the thyroid gland.[10] Medullary carcinoma carries a worse prognosis as more nodes are involved.[11]

Long-term clinical control of disease is achieved in most patients after all types of operations. In terms of survival, the superiority of an extended operation for eradication of primary or regional lymph node metastases has not been conclusively demonstrated. In this series, patients with the shortest survival had the most extensive surgical procedure. The length of survival after surgery appears to depend more on the inherent invasiveness of the cancer and the level of the host's resistance. One patient had 95 percent thyroidectomy and radical neck dissection and lived five months. Another had total thyroidectomy and radical neck dissection and lived six months.

The immunology of thyroid carcinoma has been addressed by only a few workers. Perhaps improved survival with lymph node metastases lies in the area of lymph node function and immunology. The authors' criteria for lymph node dissection are: (1) if the degree of involvement appears to have impaired lymph node function that for all practical purposes only cancer would be left behind and no functional lymph tissue; (2) for cosmetic reasons; (3) to remove any bulky tissue that does or could possibly interfere with digestive or respiratory function and to reduce tumor burden; and (4) for histological diagnosis. Our recommendations for surgery are similar to Marchetta's, total thyroidectomy for three reasons:[13]

1. Serial sections of the thyroid glands have demonstrated multicentric foci of involvement.

2. If a patient, at a later date, develops metastases in the lung or in bone, total thyroidectomy is a prerequisite to the use of therapeutic radioactive iodine.

3. The thyroid compartment can be dissected more easily and more adequately the first time the surgeon is in this area.

Secondary operations are more apt to injure vital structures such as the parathyroid glands and the recurrent laryngeal nerve. In the rare case where neck dissection is indicated, where possible it should be of a modified type leaving the sternomastoid muscle, the internal jugular vein, and the spinal accessory nerve intact. The morbidity and deformity are markedly diminished compared to the standard radical neck dissection. However, medullary carcinoma has a poorer survival with nodal metastases and usually should be treated with standard radical neck dissection.[11]

In six (19.2 percent) of patients, the initial operation was performed for presumed benign disease with final pathological diagnoses of carcinoma. Frozen sections were benign. Since thyroid carcinoma carries such a good prognosis (except when anaplastic) in most cases, the decision to reoperate should be delayed. The worst time to re-enter the operative field is three or four days following thyroidectomy. There is considerable induration, the tissues are friable, anatomy is distorted, and the ability to perform a de-

Table 5. Distribution of Metastases in Thyroid Carcinoma (Howard University Hospital)

Type of Carcinoma	Regional Nodes	Lung	Bone	Supra Vulva	No Nodes Clavicular	Submitted	Negative Nodes
Follicular	3 (27%)	2 (18%)	3 (27%)	1 (9%)	1 (9%)	6 (54%)	2 (18.15%)
Papillary	4 (36%)	2 (18%)	0	0	0	6 (54%)	1 (9.0%)
Mixed	2 (28%)	0	0	0	0	4 (57%)	1 (14%)
Hurthle	0	0	0	0	0	0	0
Medullary	0	0	0	0	0	0	0
Total for all types (except Hurthle and medullary)	9 (29%)	4 (12%)	3 (9%)	1 (3%)	1 (3%)	16 (51%)	4 (12%)

liberate clean dissection without injuring vital structures is difficult. The patient is placed on a strict regimen of interval examinations.

Postoperative swelling and induration are allowed to subside. As the tissues become supple, the neck can be more adequately evaluated. At the end of approximately three months, a decision is made relative to additional surgery. If there is evidence that tumor was transected or left behind at the time of surgery, total thyroidectomy is then advised. If, on the other hand, the surgeon is of the opinion that the cancer was removed at the initial operation surrounded by a margin of normal tissue, and at the end of the three-month period there are no suspicious areas of residual or recurrent disease, one might elect to follow these patients clinically. There is considerable evidence to indicate that thyroid-stimulating hormone (TSH) stimulates the growth of some malignant tumors of the thyroid gland. It is well recognized that dessicated thyroid will suppress the secretion of TSH. Postoperatively, in the absence of clinical metastases, the use of dessicated thyroid or one of its analogs is warranted: first, as replacement therapy; and second, to suppress any subclinical disease which may be present. Ichikawa and Saito[14] have demonstrated the presence of TSH receptors in thyroid neoplasms. The presence of TSH receptors in papillary carcinoma seems to coincide with TSH dependency of papillary carcinoma. It seems possible that the efficacy of thyroid hormone therapy in each case of thyroid carcinoma may be determined by the presence or absence of TSH receptors.[13] It is clear that the dose of thyroid hormone must not be too low, in which case it may not be suppressive, nor too high, because of the risks of excessive thyroid hormone dosage, which can induce discomfort, loss of weight, or heart problems, particularly in older patients. The actual dose required to suppress TSH secretion can be determined by means of serial determinations of pituitary thyrotropin (TSH) levels and the TSH response to thyrotropin-releasing hormone (TRH). TSH suppression is considered achieved when serum TSH concentrations have decreased towards the low values of the normal range and when the TSH response to TRH is inhibited.[14] Thyroid hormone replacement was used in 22 of our 31 patients. As there were no controls, no conclusions can be determined from this survey concerning the increased survival and morbidity with hormone replacement.

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