Surgical Intervention in Chronic (Hashimoto's) Thyroiditis

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The incidence of chronic (Hashimoto's) thyroiditis in surgical specimens is relatively high, *i.e.*, 13% in collected studies, for a disease with clinical and laboratory characteristics that are sufficiently specific, that thyroidectomy should rarely be required for diagnosis or treatment. This incidence is presumably related to the difficulty in distinguishing between thyroiditis and a thyroid neoplasm. Experience with 260 thyroidectomies at the North Carolina Memorial Hospital performed between 1975 and 1980 for a dominant thyroid mass was reviewed to determine the reliability of criteria for diagnosis and the indications for surgical treatment. Using the criteria of clinical findings, complemented by laboratory studies, *e.g.*, free thyroxine index, thyroid autoantibodies, TSH level, thyroid scan, in addition to the judicious use of the cutting (core) needle biopsy procedure, the incidence of Hashimoto's thyroiditis in this series was 3% and cancer—27%. Four patients had Hashimoto's thyroiditis coincidental to another disease for which thyroidectomy was performed. In seven patients Hashimoto's thyroiditis alone constituted the indications for operation. The indications for operation in these patients were: autonomous function with mild hyperthyroidism (2 patients); associated cold nodule (2 patients); thyromegaly unresponsive to suppressive therapy (2 patients); and rapidly enlarging mass simulating a neoplasm (1 patient). Only one of 71 patients with well differentiated carcinoma had Hashimoto's thyroiditis. One patient with Hashimoto's thyroiditis had associated lymphoma. In most patients, Hashimoto's thyroiditis can be identified using appropriate clinical and laboratory criteria without resorting to thyroidectomy to differentiate between thyroiditis and a neoplasm. Operations are indicated in patients with suspected or established chronic thyroiditis for: 1) the presence of a dominant mass with incomplete regression on suppressive therapy. 2) Progression of thyromegaly despite suppressive therapy. 3) Historic or physical findings suggesting a malignancy, *e.g.*, irradiation, multiple endocrine adenomatosis (MEA) syndrome, nerve paralysis, pain, tracheal compression, stipple calcification and cervical lymph node enlargement. 4) Indeterminant findings on cutting needle biopsy, *e.g.*, lymphoma versus thyroiditis. Rarely, an operation is required for an oppressive goiter or associated hyperthyroidism.

CHRONIC (HASHIMOTO'S) THYROIDITIS is an autoimmune disease that may be associated with varying degrees of thyroid enlargement. A common cause of thyromegaly, it may coexist with benign (adenomatous goiter) or malignant thyroid disease. In the selection of patients for surgical treatment, a discriminating approach is necessary to avoid operating on patients with chronic thyroiditis while providing every patient with malignant disease an opportunity for cure. The clinical characteristics of Hashimoto's thyroiditis are sufficiently specific that thyroidectomy should rarely be required for diagnosis.[1-3] Hashimoto's thyroiditis usually presents with diffuse, less commonly asymmetric or nodular thyromegaly,[4,5] occurring more frequently in women with a normal or slightly decreased free thyroxin index, an increased thyroid stimulating hormone (TSH), positive antithyroglobulin or antinuclear antibodies, and a thyroid scan demonstrating heterogeneous uptake of the radionuclide.[3,6,7] The diagnosis can usually be made on the basis of clinical findings. Histologic confirmation is not usually required. Thyromegaly results from compensatory hyperplasia of the thyroid epithelium and diffuse lymphocytic infiltration.[8,9] Regression over the course of several months usually follows the administration of thyroid hormone with suppression of TSH.[10,11] Rarely does the thyroid become impalpable. In patients with asymmetrical enlargement of the thyroid gland, nodular thyroiditis, or with incomplete failure of regression on suppressive therapy, a cutting needle biopsy procedure may be indicated to confirm the clinical diagnosis.[12-14]

Despite this characteristic clinical picture, patients undergoing thyroidectomy to differentiate "nodular goiter" from thyroid cancer, not infrequently are found to have chronic thyroiditis.[13-26] In 21,431 thyroidectomies performed for "nodular goiter"/thyroid cancer since 1965, the mean incidence of chronic thyroiditis was 12.6%, while the mean incidence of cancer was 11.3% (Table 1). The relatively high incidence of thyroiditis in some studies may be a reflection of conflicting recommendations regarding the need for thyroidectomy for pressure symptoms and because of a presumed increased incidence of thyroid cancer.[27-29]

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TABLE 1. *Incidence of Thyroiditis and Cancer in Thyroidectomy for "Nodular Goiter"*

Author	Number of Patients	Needle Biopsy*	Thyroiditis		Cancer		Thyroiditis/Cancer Ratio
			Number	Per Cent	Number	Per Cent	
Robinson[15]	148	—	4	(3)	28	(19.0)	.14
Hoffman[16]	202	—	11	(6)	58	(29.0)	.2
San Fellipo[17]	327	—	61	(19)	53	(16.0)	1.13
Brooks[13]	502	—	27	(5)	43	(19.0)	.6
Brooks[13]	210	CNB	3	(1)	39	(19.0)	.08
Schlicke[18]	713	—	163	(23)	49	(7.0)	3.3
Wang[19]	189	CNB	6	(3)	15	(8.0)	.4
Thomas[20]	66	CNB	4	(6)	19	(29.0)	.2
Galvan[21]	1076	ABC	51	(5)	137	(13.0)	.37
Walfish[22]	90	ABC	3	(3.3)	17	(19.0)	.18
Crile[14]	24	CNB	1	(4)	11	(46.0)	.09
Friedman[23]	247	ABC	15	(6)	52	(21.0)	.29
Foster[24]	17,345	?	2304	(13)	1862	(10.7)	1.24
Croyle[25]	88	—	29	(33)	16	(18.0)	1.81
Webb[26]	204	ABC	28	(14)	28	(14.0)	1.0
Totals	21,431		2710	(12.6)	2427	(11.3)	1.1

* ABC (Aspiration biopsy cytology). CNB (cutting needle biopsy) used in selected patients.

The goal of this study was to establish more reliable criteria for operation in patients with a clinical or histopathologic (needle biopsy) diagnosis of chronic (Hashimoto's) thyroiditis in an effort to reduce the number of unnecessary operations. Our experience in patients with asymmetric thyroid enlargement, a dominant thyroid mass, who were operated on to differentiate between benign and malignant thyroid disease was reviewed. Included were selected patients with an established diagnosis of chronic (Hashimoto's) thyroiditis. The selection of patients with a dominant thyroid mass for surgical treatment has been previously described.[20]

Materials and Methods

All patients who underwent thyroidectomies at the North Carolina Memorial Hospital from 1975 to 1980 provided the clinical material. Data was collected from the files of the Department of Pathology. The diagnoses in 260 patients were: adenomatous goiter, adenoma, cyst, well differentiated cancer, poorly differentiated cancer, lymphoma and thyroiditis; hyperthyroidism (Graves' disease) was excluded. Thyroiditis was classified as Hashimoto's thyroiditis (diffuse lymphocytic infiltration with germinal centers, small follicles depleted of thyroglobulin, distorted, enlarged epithelial cells with large nuclei and eosinophilic cytoplasm—Askanazy cells—and varying degrees of fibrosis) and nonspecific or focal thyroiditis. The diagnosis by the pathologist was accepted without further appraisal. During the same period the pathologic findings in patients undergoing cutting needle biopsy procedures of the thyroid were reviewed.

To obtain an estimate of the frequency of thyroiditis as a cause for thyromegaly, 14 studies of thyroid surgical specimens in 21,431 patients reported from 1966 to 1979 were surveyed (Table 1). Also reviewed were four studies of thyroid needle biopsy specimens in 4,982 patients from 1973 to 1977 (Table 2).[19,23,26,30] In each study the incidence of thyroiditis and cancer was noted.

Results

The primary diagnoses in the 260 patients undergoing thyroidectomy because of a dominant mass to differentiate benign from malignant thyroid disease were:

TABLE 2. *Incidence of Thyroiditis in Needle Biopsy of the Thyroid*

Author	Number of Patients	Thyroiditis		Benign Lesion		Cancer	
		Number	Per Cent	Number	Per Cent	Number	Per Cent
Crile[30]*	135	23	(17.0)	107	(79.3)	5	(3.7)
Wang[19]*	189	6	(3.2)	168	(88.9)	15	(7.9)
Friedman[23]†	265	15	(5.7)	198	(74.7)	52	(19.6)
Webb[26]†	204	28	(13.7)	148	(72.5)	28	(13.7)
Total	793	72	(9.1)	621	(78.3)	100	(12.6)

* Cutting needle biopsy. † Aspiration biopsy cytology.

TABLE 3. *Pathologic Findings in 260 Thyroidectomies* North Carolina Memorial Hospital 1975–1980*

Diagnosis	Number	Per Cent
Adenomatous goiter	120	46
Well differentiated cancer	71	27
Adenoma	52	20
Hashimoto's thyroiditis	7	3
Cyst	5	2
Medullary cancer	2	0.8
Undifferentiated neoplasm	2	0.8
Lymphoma	1	0.4

* Hyperthyroidism (Graves' disease) excluded.

adenomatous goiter (120 patients: 46%); well differentiated carcinoma (71 patients: 27%); adenoma (52 patients: 20%); Hashimoto's thyroiditis (7 patients: 3%); cysts (five patients: 2%); and undifferentiated neoplasm, including lymphoma (five patients: 2%) (Table 3).

A diagnosis of thyroiditis was made in 28 patients: nonspecific in 17 patients, Hashimoto's in 11 patients. In four patients, Hashimoto's thyroiditis was a finding incidental to a dominant neoplastic mass, *e.g.*, lymphoma, well differentiated cancer, Hurthle cell adenoma, and anaplastic cancer (Table 4). Seven patients were diagnosed as having Hashimoto's thyroiditis only. The indications for thyroidectomy in these seven patients were: diffuse thyromegaly with mild hyperthyroidism precluding suppressive therapy (two patients); failure of regression of thyromegaly in two patients with a prior diagnosis of Hashimoto's thyroiditis and the presence of a residual mass (two patients); a dominant "cold nodule" in association with other findings consistent with thyroiditis (two patients) and rapid increase in size of the thyroid mass consistent with a malignant neoplasm (one patient) (Table 5). In 17 patients, thyroiditis was considered nonspecific and secondary to or associated with another lesion, *e.g.*, well differentiated cancer (12 patients); adenomatous goiter (three patients); adenoma (one patient) and medullary carcinoma (one patient) (Table 6).

Table 1 gives the results of 14 studies of thyroid surgical specimens. The incidence rate of thyroiditis varied from 1–33% (mean: 12.6%). The incidence rate of cancer varied from 7–46% (mean: 11.3%). The ratio of patients with thyroiditis to those with thyroid cancer averaged 1:1. In five studies there was a high incidence of Hashimoto's thyroiditis and a relatively low incidence of cancer.[17,18,24–26] The accuracy of needle biopsy specimens in these studies was always greater than 90%.

A review of four studies of needle biopsy specimens demonstrated the diagnosis of thyroiditis in from 3–17% (mean: 9.1%), while the diagnosis of cancer varied from 4–20% (mean: 12.2%) (Table 2). The differing incidence of thyroiditis and cancer, as reported in these studies, probably reflects case selection rather than a true incidence in variability. Thus, needle biopsy would not be indicated if other criteria for chronic thyroiditis were convincing, *e.g.* TSH level, character of thyroid, findings on radionuclide scan, and thyroid autoantibody level.

Our experience with 46 needle biopsy procedures performed during the past five years are recorded in Table 7. Fourteen patients had a diagnosis of Hashimoto's thyroiditis, while seven were considered to have nonspecific thyroiditis associated with another disease. Of 10 patients with Hashimoto's thyroiditis treated with thyroid hormone, five had appreciable decrease in their thyromegaly.

Discussion

Hashimoto's thyroiditis is probably the most common cause of diffuse goiter in the United States, with an incidence of 2% proven at autopsy examination. The frequency of the disease appears to have increased during the past several decades.[2] Hashimoto's thyroiditis is considered an autoimmune disease with a variety of antithyroid antibodies, including microsomal and thyroglobulin antibodies, having been detected in the patient's serum. It is not established that these antibodies are cytodestructive. Both humoral and cell mediated immunity are probably involved in the production of the inflammatory response.[2,3] The initial lesion in Hashimoto's thyroiditis is believed to be a genetically determined abnormality in a class of thymus-derived lymphocytes (T cells). Well recognized is the tendency for Hashimoto's thyroiditis (and Graves' disease) to occur in members of the same family.[2]

Thyroiditis also occurs following irradiation in infancy and childhood. In 68 patients operated on following prior irradiation,[31] the second most frequent histologic change following focal hyperplasia was lymphocytic thyroiditis. A variable degree was present in two-thirds of the patients. The pathogenesis was thought to be related to cell damage and destruction secondary to ionizing radiation. The release of thyroglobulin and altered epithelial cell microsomes act as

TABLE 4. *Hashimoto's Thyroiditis in Patients Undergoing Operation "Nodular Goiter"/Thyroid Cancer*

Only diagnosis—7
Associated diagnosis—4
Hürthle cell adenoma
well differentiated cancer
lymphoma
poorly differentiated cancer

TABLE 5. *Indications and Findings in Patients Undergoing Operation for Hashimoto's Thyroiditis*

Age	Sex	Problem	Duration	Physical Findings	Thyroid Function Tests	Thyroid Scan	Suppressive Rx	Preop Diagnosis	Indications/ Operation
47	F	Thyroid mass	1–3 years	2 × 2 × 2 cm mass	T4 ↑	Unhomogeneous	0	Hashimoto's thyroiditis hyperthyroidism	Pressure/ hyperthyroidism
56	F	Thyroid mass	10 years	Diffuse thyromegaly	T4-N TSH ↑	Unhomogeneous	+	Hashimoto's thyroiditis	Oppressive goiter Suppression not tolerated
67	F	Residual mass	3 years	2 × 1 × 1 cm mass	T4 ↓		1 yr.	Hashimoto's thyroiditis	Residual mass
67	F	Thyroid mass (hypothyroidism)	1–12 months	Asymmetric thyromegaly	T4 ↓ TSH ↑	Cold nodule	0	Hashimoto's thyroiditis	Cold nodule
32	F	Thyroid mass	1 year	2 × 2 × 2 cm mass	T4 normal TSH ↑	Cold nodule	0	Hashimoto's thyroiditis	Cold nodule
61	F	Recurrent mass (Prior lobectomy for Hashimoto's thyroiditis)	1–12 months	2 × 2 × 4 cm mass	T4 normal TSH normal		+	Hashimoto's thyroiditis	Residual mass
30	M	Thyroid mass	1 month	Diffuse thyromegaly	T4 normal TSH ↑		0	Subacute thyroiditis	Neoplasm

antigens eliciting a cellular and humoral response. The histologic findings are those of chronic lymphocytic thyroiditis.

Hashimoto's thyroiditis is characterized by defective hormone synthesis as manifest by the lack of organification of trapped iodide. This accounts for a positive perchlorate discharge test and discordant imaging on thyroid scan (Fig. 1). With reduction in the functional capacity of the thyroid, there is increase in TSH secretion and the development of a goiter. Associated fibrosis may accentuate the lobulations of the thyroid creating asymmetry and simulating a nodular goiter or neoplasm. Antithyroglobulin and antimicrosomal antibodies are usually present when an assay of sufficient sensitivity is used. They may fall in longstanding disease. Other thyroid disorders, *e.g.*, subacute thyroiditis, Graves' disease, thyroid cancer and adenomatous goiter may be associated with some increase in thyroid antibody titers.[1,6] The presence of very high antibodies is characteristic of Hashimoto's thyroiditis.[2] Thyroid scans using 99m technetium or 131 iodide characteristically demonstrate a heterogeneous uptake of the radionuclide.[7] Because of the defect in organification of trapped iodide, there may be discordant imaging when comparing technetium-99m which measures the trapping ability of the epithelial cell and iodide-131 which measures both trapping and organification (Fig. 1). Although patients with thyroiditis usually have an unhomogeneous uptake of radionuclide, there has been one report in which Hashimoto's thyroiditis presented as a solitary functioning thyroid nodule.[32]

There is a lack of consensus as to whether there is an increased incidence of thyroid cancer in patients with Hashimoto's thyroiditis. The coincidence of thyroiditis and well differentiated cancer will vary in the absence of any causal relation between these diseases and will be influenced by geography, histologic criteria for the disease, *i.e.* Hashimoto's thyroiditis versus nonspecific thyroiditis, and the diligence of the pathologist in searching for thyroid cancer. Support for a causal relationship between thyroiditis and cancer is that the elevated thyroid stimulating hormone results in a stimulus for growth and function of thyroid epithelium.

TABLE 6. *Nonspecific Thyroiditis in Thyroidectomy 1975–1980*

Diagnosis	Number	Thyroiditis	
		Number	Per Cent
Adenomatous goiter	120	3	2.5
Well differentiated cancer	71	12	17.0
Adenoma	52	1	1.9
Cyst	5	0	—
Undifferentiated cancer	3	0	—
Medullary cancer	2	1	50.0

TABLE 7. *Cutting Needle Biopsy of the Thyroid**

Diagnosis	Number	Per Cent
Benign lesion	28	44
Thyroiditis	14	22
Insufficient tissue	11	17
Well differentiated cancer	6	9.5
Other	4	6.3
Total	63	

* Vim-Silverman needle.

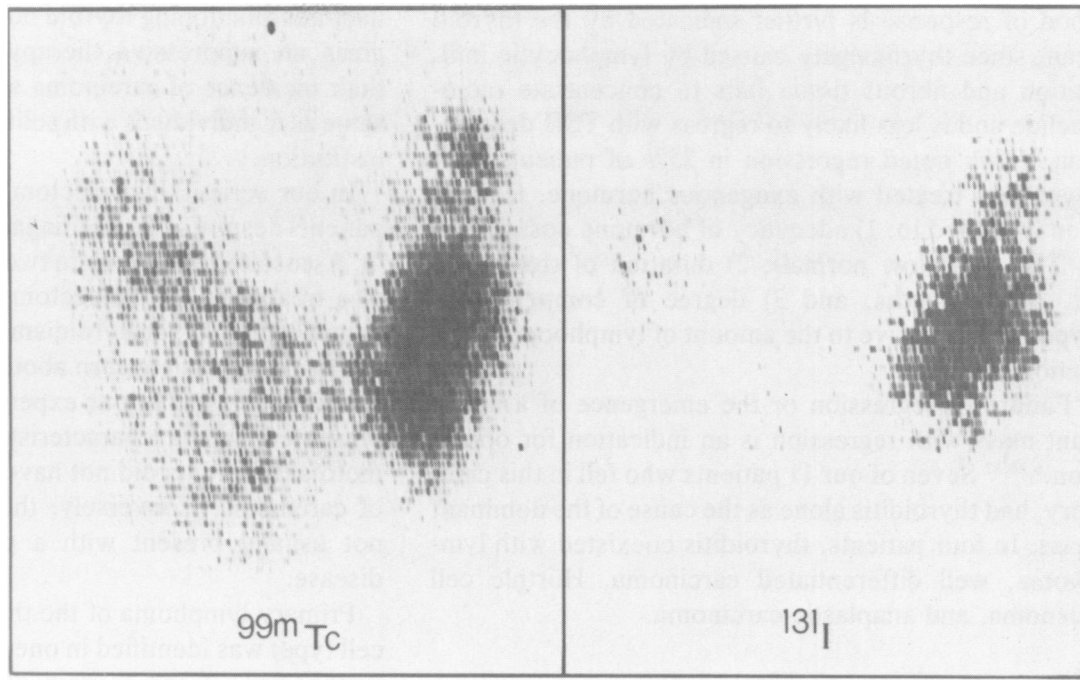

FIG. 1. Discordant binding is demonstrated in a patient with unilobar thyroiditis. Heterogeneous uptake of technetium-99m is based on the trapping of the isotope by follicular epithelium. Because of the inability of the epithelium to organify trapped iodide, the 24-hour I^{131} scan demonstrates minimal uptake.

TSH is a recognized promoting factor in thyroid cancer.[33] In the thyroid gland previously affected by an initiating factor, *e.g.* radiation, genetic susceptibility, increased TSH levels could play a role in the development of well differentiated thyroid cancer.[34] The question is complicated by the differing reported incidence of thyroid cancer in Hashimoto's thyroiditis. Daily,[35] Hirabayashi[28] and Schlicke[18] concluded there is a significant association between thyroiditis and thyroid cancer. Woolner,[9] Degroot and Stanbury,[6] Crile[36] and Clark[37] disagree. In analyzing these reports, it is not always clear as to whether the authors differentiated between a nonspecific thyroiditis and Hashimoto's thyroiditis. Winship and Rosvoll[38] observed 12% of children with thyroid cancer having associated "thyroiditis." Further, it is difficult to establish the overall incidence of thyroid cancer in our population.[38–40] The incidence at autopsy examination seems to vary with the interest of the investigator, *e.g.* from 2.5% in unselected autopsy examinations,[41] 13% in 100 consecutive autopsy examinations in Michigan[42] to 24% in routine postmortem examinations in Hawaii.[43] Many of these cancers are occult and probably have little biologic significance. In reviewing the literature (Table 1), when an increased frequency of Hashimoto's thyroiditis is reported in surgical specimens, there is an actual decrease in the frequency of cancer.

Published reports indicate a relatively high incidence of thyroiditis in patients operated on to distinguish between benign and malignant thyroid disease (Table 1). This would seem to be based, primarily, on the inability to establish the diagnosis of Hashimoto's thyroiditis before operation. These reports further support the thesis that there is not an increased incidence of well differentiated cancer in Hashimoto's thyroiditis. The authors, having a relatively high incidence of thyroiditis in their surgical specimens, did not have a higher incidence of cancer. The low incidence of thyroiditis in some series may represent a more discriminating approach. Authors performing needle biopsies usually had the lowest incidence of thyroiditis in surgical specimens, presumably because such patients were excluded from thyroidectomy. This is most conspicuous in the experience of Brooks, who, without needle biopsy had an incidence of thyroiditis in 27% of surgical specimens, whereas with the use of needle biopsy the incidence was reduced to 3%. The incidence of thyroid cancer was 19% in both groups.[13] The 3% incidence in our study is comparable to that of Brooks.

It is recognized that thyroiditis may be difficult to differentiate from thyroid carcinoma or actually may coexist. Our approach has been to establish a diagnosis of thyroiditis by clinical characteristics and atypical thyroid function studies, *i.e.* elevated TSH, low thyroxine index, positive thyroid antibodies, and a heterogeneous uptake of radionuclide on thyroid scan. When there is a dominant thyroid mass, further measures include a cutting needle biopsy and scanning with both technetium-99m as well as iodide-131 for the presence of discordant findings. (Fig. 1). Treatment of Hashimoto's thyroiditis is by TSH suppression with thyroxine in a dose of 0.15–0.25 mg.[1,6,37] Regression of the goiter usually occurs, although with some variability of response.[3,11,37] Goiters associated with an elevated TSH, which is present in approximately 38% of the patients, would seem most likely to respond. The likeli-

hood of response is further indicated by the thyroid scan, since thyromegaly caused by lymphocytic infiltration and fibrous tissue fails to concentrate radionuclide and is less likely to regress with TSH deprivation. Clark noted regression in 25% of patients with thyroiditis treated with exogenous hormone. Regression is related to: 1) adequacy of hormone dosage (fall in TSH to below normal); 2) duration of treatment, *i.e.* 6–12 months, and 3) degree of compensatory hyperplasia relative to the amount of lymphocytic infiltration.

Failure of regression or the emergence of a dominant mass with regression is an indication for operation.[5,20,37] Seven of our 11 patients who fell in this category, had thyroiditis alone as the cause of the dominant mass. In four patients, thyroiditis coexisted with lymphoma, well differentiated carcinoma, Hürthle cell adenoma, and anaplastic carcinoma.

Case Reports

E.F. A 60-year-old woman with a longstanding history of goiter presented in April 1975 with a dominant mass in the left lobe of the thyroid. In May of 1978 a radioiodide scan showed a 24-hour uptake of 8% with all uptake being in the right lobe. The TSH was 50 (10 times norm). The administration 0.15 mg of Thyroxine daily resulted in partial regression of the goiter. The thyroxine was increased to 0.2 mg daily in March 1979, with further regression. Two 2 cm nodules remained palpable in the left lobe. There was also a 1.5 cm midline nodule. Thyroid function studies including a TSH level were normal, with the antithyroglobulin titer being elevated. A needle biopsy specimen was ambiguous with respect to thyroiditis/lymphoma and thyroidectomy advised. Because of further regression of the thyromegaly, the operation was deferred for two months. At that time a 2 cm firm, irregular mass remained in the left lobe. A left thyroid lobectomy was performed, with histologic studies demonstrating a malignant lymphoma (large, noncleaved cell type) superimposed on Hashimoto's thyroiditis. A bone marrow biopsy specimen and computerized tomographic study of the chest demonstrated no evidence of extension of the disease. External radiation to the neck was administered. Suppressive therapy with thyroid hormone continues.

K.S. A 66-year-old woman was examined in 1974 because of a 2 cm firm mass in the right lobe of the thyroid. A iodide-131 scan demonstrated enlargement of the right lobe, with a cold central area which proved to be solid by ultrasonographic examination. A ^{75}selenomethionine scan demonstrated increased uptake throughout the gland consistent with Hashimoto's thyroiditis. Examination of a needle biopsy specimen confirmed the diagnosis, and the patient was placed upon 75 μg L-triiodothyronine per day. When, after seven months of suppressive therapy, a 2 cm firm nodule remained, a right lobectomy was performed. Pathologic examination demonstrated Hashimoto's thyroiditis. Suppressive therapy with thyroid hormone continues.

A recent study by Clark et al. reported cancer in 12% of 75 patients with Hashimoto's thyroiditis.[37] Patients with thyroiditis at greatest risk from an associated cancer usually were selected by the presence of a dominant nonfunctioning thyroid nodule, which failed to regress on suppressive therapy. Using these criteria, their incidence of carcinoma was 25%, essentially the same as in individuals with solitary cold nodules at their institution.

In our series, thyroidectomy was advised in seven patients despite a clinical diagnosis of thyroiditis (Table 4). Associated autonomy in two did not permit suppressive treatment. Thyroidectomy was recommended to control mild hyperthyroidism. In the remaining patients, there was concern about an underlying or associated neoplasm. In our experience, the patients who presented with a characteristic syndrome of Hashimoto's thyroiditis did not have an increased incidence of carcinoma. Conversely, those with carcinoma did not usually present with a picture of Hashimoto's disease.

Primary lymphoma of the thyroid (large noncleaved cell type) was identified in one of our patients. Primary lymphomas of the thyroid are infrequent, with approximately 250 cases reported in the literature.[44] The overall incidence of Hashimoto's thyroiditis in patients with lymphomas of the thyroid is 25%, whereas 1.4% of patients with lymphocytic thyroiditis have lymphoma.[44] The causal relationship between lymphocytic thyroiditis and lymphoma is questionable. Thus, the diagnosis of thyroiditis by needle biopsy does not exclude an associated lymphoma. This possibility should be considered in patients in whom the course of the disease is not consistent with Hashimoto's thyroiditis.

Although Hashimoto's thyroiditis may simulate a neoplastic goiter, the clinical and laboratory findings are sufficiently specific that this disease can usually be identified without an operation. Needle biopsy is a valuable adjunct to the diagnosis. The degree of regression of thromegaly may be anticipated on the basis of TSH level and the amount of diminished function on scan resulting from lymphocytic infiltration and associated fibrosis. In this study, using these criteria, the incidence of Hashimoto's thyroiditis was 3% in patients undergoing thyroidectomy to distinguish between "nodular" goiter and thyroid cancer. Operation in Hashimoto's thyroiditis is indicated to identify coexistant neoplasia: 1) the presence of a dominant mass with incomplete regression on suppressive therapy suggesting cancer or lymphoma; 2) progression of thyromegaly despite suppressive therapy; 3) historic or physical findings suggesting malignancy, *e.g.* irradiation, MEA syndrome, nerve paralysis, pain, tracheal compression, stipple calcification and cervical lymph node enlargement; 4) indeterminant findings on needle biopsy, *e.g.* lymphoma versus thyroiditis. Thyroiditis rarely requires

thyroidectomy because of an oppressive goiter or associated hyperthyroidism. Patients requiring operative intervention should be approached as others with a mass of unknown cause, *i.e.*, lobectomy with subsequent frozen section to determine the need for and extent of further surgery. Operation for an oppressive goiter should include removal of the isthmus in the medial aspect of each lobe. Hyperthyroidism should be treated by subtotal thyroidectomy. Total thyroidectomy in this disease, because of an increased morbidity rate, is not justified. All patients should be on replacement doses of thyroid hormone.

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