

Struma Lymphomatosa (Hashimoto's Disease)*

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STRUMA LYMPHOMATOSA is a form of thyroid disease about which there has been considerable divergence of opinion regarding its clinical and pathological aspects in spite of the clear description of the disease given some 40 years ago by Hashimoto. Although *struma lymphomatosa* has never been proved to be inflammatory, it is usually classified in a group with other types of thyroiditis. One of us (W. A. M.) has studied carefully the pathologic specimens of all cases of thyroiditis in which operation was performed at the Lahey Clinic, and has segregated 114 cases of characteristic *struma lymphomatosa*. We are reporting in this paper the clinical and pathological aspects of this group.

The recognition of various forms of chronic thyroiditis as distinct pathological entities is important to the clinician and to the surgeon, since it affects directly the therapy and prognosis of such forms of thyroid disease. This is particularly significant because the developing goiter may be mistaken for cancer of the thyroid, owing to its firmness and adherence to surrounding structures of the neck. There has been so little agreement on the classification of types of chronic thyroiditis that confusion in the terminology and understanding has resulted. Subacute and chronic thyroiditis of various types is observed not infrequently in a thyroid service, and a better understanding of this disease must be based upon the physical findings and the gross appearance of the thyroid enlargement, as well as upon the microscopical anatomy and the subsequent

response to treatment. In 1912 Hashimoto³ described four cases of lymphoid goiter which he stated was distinct from Riedel's disease as well as from chronic thyroiditis, specific or nonspecific, and introduced the term *struma lymphomatosa*. Prior to Hashimoto's work, in 1896 Riedel¹³ had described a form of thyroid disease, and Joll⁹ pointed out that between 1912 and 1922 very little attention was directed to Hashimoto's description of this thyroid condition as a pathological entity distinguishable from Riedel's struma. In 1928 Ewing⁶ reported that he had studied four cases which illustrated Riedel's and Hashimoto's struma, and he concluded that Hashimoto and Riedel had described the early and late stages of the same pathological process. Later (1931), Graham⁷ emphasized that Riedel's disease and *struma lymphomatosa* are distinct and distinguishable diseases, and he was able to recognize 24 cases of *struma lymphomatosa* out of 114 cases of chronic thyroiditis. It remained for Joll in 1939, in his excellent report of 81 cases, to emphasize the clinical and pathological picture of the entity (so well described by Graham), and again to illustrate clearly what constituted *struma lymphomatosa*.

Since Graham's excellent description many reports have appeared in the literature, and the clinical and pathologic features of this disease are now more clearly recognized. It seems that there should be little confusion regarding this form of disease of the thyroid gland, and yet there are reports in the literature of accumulated cases that, from their physical and pathologic descriptions, cannot possibly be accepted as *struma lymphomatosa*.

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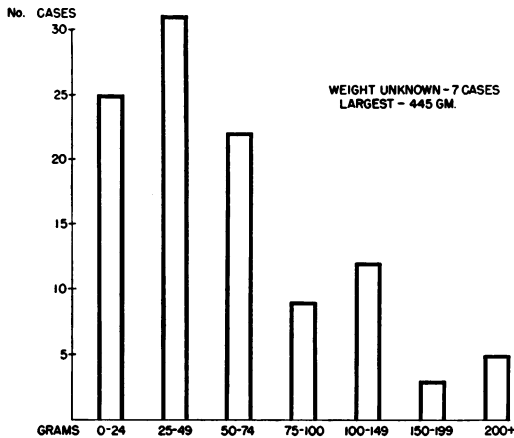


FIG. 1. Weight of thyroid tissue removed in 114 cases.

PATHOLOGY

The pathologic appearance of *struma lymphomatosa* includes changes involving both epithelium and stroma. Since the changes have been inconsistently defined by various writers, the appearance of what we consider to be typical cases will be described. Grossly, the glands were enlarged in a symmetrical fashion (Fig. 1). The degree of enlargement (Fig. 1) was not ascertainable from the pathologic examination alone, since different proportions of the thyroid tissue were removed in the respective cases. It is noteworthy, however, that weights of 100 Gm. or more were not rarities, and that the largest amount of tissue removed in any one case was 445 Gm. The capsules were characteristically thin and non-adherent, either to the underlying thyroid tissue or to adjacent structures. The cut surface of the gland revealed a lobular, non-translucent, red-yellow appearance, usually without gross evidence of fibrosis. The typical consistency was rubbery, rather than hard, as in a carcinoma.

Microscopically (Fig. 2), the typical case showed follicles greatly diminished in size and lined with highly eosinophilic epithelium (often called Hürthle cell type). Colloid was scanty in amount and frequently stained more deeply than usual, as

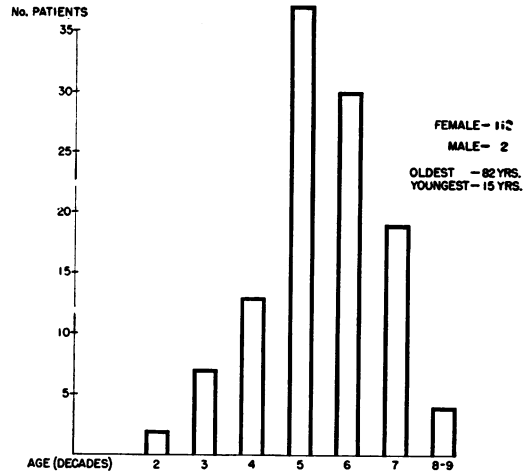


FIG. 2. Ages of patients with struma lymphomatosa. The majority are in the fifth and sixth decades.

though it were partly dehydrated or desiccated. Between the small follicles were variable numbers of round cells which, although usually predominantly lymphocytes, included many plasma cells as well. In some otherwise typical cases, plasma cells were more numerous than lymphocytes. Sometimes large mononuclear cells were also present. The degree of round cell infiltration was variable; in some cases it was intense, and in these, secondary lymphatic nodules were common and prominent. In addition to the round cell infiltration of the interfollicular tissue many of the cases showed variable amounts of fibrosis. The fibrosis, however, was never extreme in degree, and in none of the cases did it suggest a transition to the type of dense fibrosis described by Riedel.

Although the microscopic changes were present in all parts of the gland, some cases, which were presumed to be earlier in their development, showed a more patchy distribution of the typical findings. In all of the cases, however, where it could be determined, the process involved all regions of each lobe, and even when patchy in distribution, was present in all portions of the thyroid.



FIG. 3. Typical gross appearance of struma lymphomatosa. Note thin capsule, lobulated cut surface and diffuseness with which entire gland is involved.

Pathology Summary and Comment. The important characteristics of the pathologic features of *struma lymphomatosa*, as recognized in this study, may be summarized as follows: a diffuse symmetrical enlargement of the thyroid, with atrophic follicles and round cell infiltration, at times accompanied by mild fibrosis. Cases that did not meet these qualifications were not included in this study, although it is realized that some early cases of *struma lymphomatosa* may well have been omitted because of this.

It should be emphasized that the pathologic diagnosis of *struma lymphomatosa*, as defined in this study, requires more than just an infiltration of the thyroid with lymphocytes. Indeed, the round cell infiltration often seems to represent a secondary response, or accompaniment to a diffuse atrophy of the epithelium. Although its nature and pathogenesis are as yet unknown, *struma lymphomatosa*, as herein defined, is not a focal involvement of the thyroid, but a diffuse process which has no demonstrable relationship to hyperplasia, neoplasia, Riedel's struma, or subacute thyroiditis. These remarks regarding the pathology of *struma lymphomatosa* are important to appreciate in reading the clinical portion of this work because the pathologic diagnosis of this disease is often not so strictly limited.

CLINICAL DATA

We are reporting 114 cases which can be classified from pathologic features as *struma lymphomatosa*. In a previous report¹⁰ from the Lahey Clinic and Pathological Laboratory of the New England Deaconess Hospital, the pathologic diagnosis of chronic thyroiditis of various types was made in 187 cases, an incidence of 0.75 per cent; the percentage of *struma lymphomatosa* in that group of thyroiditis was 41.7, an incidence of 0.31 per cent of all cases operated upon.

During the same period that the pathologic diagnosis of *struma lymphomatosa* was made in this series of 114 cases, a total of 31,661 thyroid operations of all kinds was performed and the pathologic diagnosis of primary chronic thyroiditis of the various types was made 585 times, an incidence of 1.85 per cent. The incidence (0.36 per cent) of *struma lymphomatosa* in this group is very similar to that reported previously.

Incidence. In 1931 Graham found only 24 cases in the literature. McClintock and Wright,¹¹ in 1937, collected 50 cases from the literature with the characteristic findings of *struma lymphomatosa* and recorded only those cases (47) not included in Graham's report. They concluded that nearly every case of *struma lymphomatosa* then available in the literature was represented in Graham's report and their own contribution. In 1939 Joll added a total of 81 cases, 51 from his own practice and 30 (not previously published) sent to him. More recently (1951), Statland, *et al.*,¹⁴ reported 51 cases from the Massachusetts General Hospital, which constituted 1.4 per cent of all thyroidectomies done there.

During a ten-year period (1944-1953) 389 specimens of thyroiditis have been studied in the Pathological Laboratory of the New England Deaconess Hospital, and the occurrence of the various types is given in Table I.

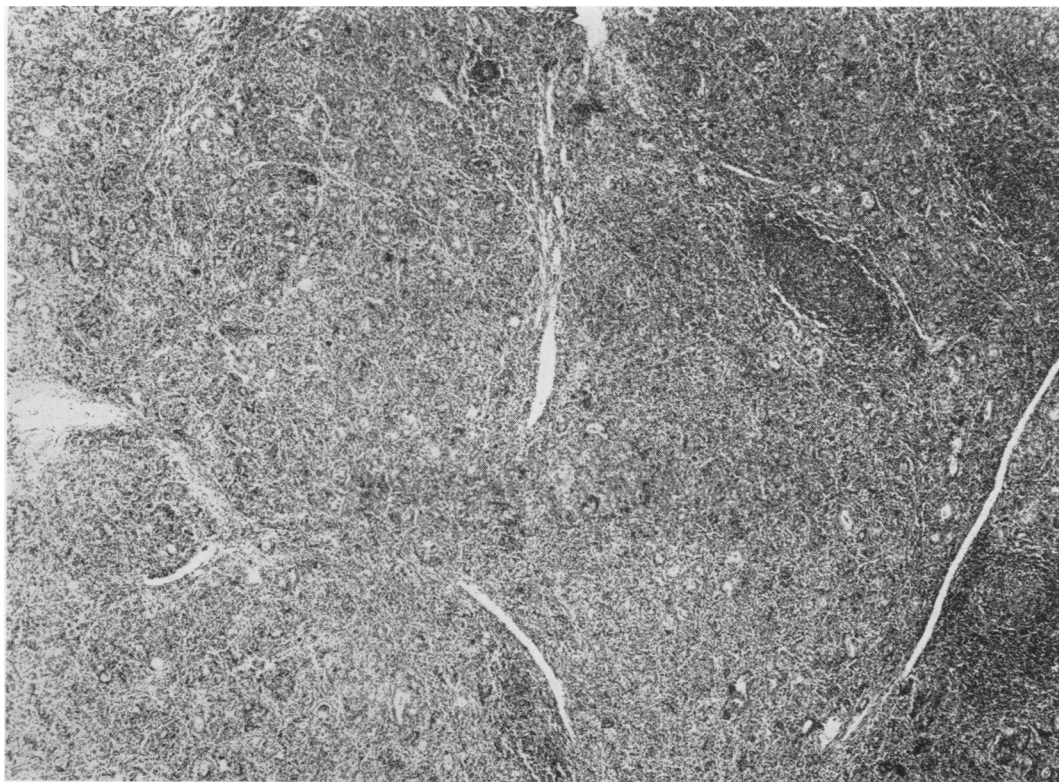


FIG. 4. Typical microscopic appearance of struma lymphomatosa. The thyroid epithelium is practically unrecognizable. Follicles are small and mostly devoid of colloid. Stroma is diffusely infiltrated with round cells. One secondary lymphatic nodule is visible (x 43).

The relative frequency of *struma lymphomatosa* among thyroid operations is shown in Table II from various reports, and probably in a larger measure the wide variation in incidence is due to different interpretations of the microscopical features.

Age. The average age in this group of 114 cases was 50.2 years. The disease is more prominent in the fifth and sixth decades (Fig. 2) but, on the other hand, age has not proved to be a reliable diagnostic criterion. Our youngest patient was a girl, age 15 years, and our oldest patient was age 81. Joll stated that the disease is rare in patients under 40 years. In our series we noted 28 patients 40 years of age or younger. Joll reported a girl, age 10, and Statland, *et al.*, reported two girls, age 10 years, and stated that to their knowledge they were the youngest yet reported. In their series (51 cases) there were twice as many patients

who were over 36 years as under this age.

Sex. The great majority of patients were women. There were only two males with *struma lymphomatosa* in this group of 114 cases. This is similar to Joll's group, and to the series reported by McClintock and Wright. Statland, *et al.*, stated that all their patients were women.

Geographical Distribution. Most of the patients in our group came from the New England states. Joll stated that the disease occurred throughout Europe, but remarked that de Quervain said it is almost unknown in his district of Berne. Joll found that only 5 per cent of his 51 cases came from endemic goiter areas, and was of the opinion that this disease may be more common in nongoitrous districts. It affects individuals of all social states and races, although none of our patients were Negroes, a finding likewise reported in the literature.

TABLE I. *Types of Thyroiditis in 389 Cases.*

	Cases
Struma lymphomatosa	83
Riedel's struma	15
Nonspecific thyroiditis	291
Total	389

Symptoms. None of our patients gave an antecedent history of acute illness indicating a toxic process or infection at the onset of the thyroid disease. In contrast to subacute thyroiditis, no history of upper respiratory infections or sore throat, followed by tightness and soreness in the neck, was obtained. There are no data to suggest that *struma lymphomatosa* is a late result of a thyrotoxicosis, since a history of thyrotoxicity could not be obtained in any of these patients. We have seen many cases of primary hyperthyroidism in which the microscopic study showed primary hyperplasia with the marked lymphocytic infiltration that is seen in *struma lymphomatosa*, but these glands did not have the microscopic epithelial characteristics of *struma lymphomatosa*, and many regions of active hyperplastic colloid-producing acini were present with lymphoid areas.

The outstanding complaint in all but four of our cases was goiter or enlargement in the neck, this enlargement often being gradually progressive, and occasionally becoming quite large. In one patient the resected gland weighed 445 Gm. Many patients had symptoms of choking or pressure upon bending over or lying down. Fatigue, nervousness, and pressure symptoms were common. Weight loss was seldom noted; rather, a tendency to gain weight. Weight gain is probably related to hypofunction of the thyroid gland, as 30 of the 114 patients had preoperative basal metabolic rates which ranged from -15 to -30 per cent. In many patients the blood cholesterol was elevated above normal. Occasionally, hoarseness (seven cases) and difficulty in swallowing (nine cases) were noted, but in neither in-

TABLE II. *Incidence of Struma Lymphomatosa.*

	No. of Cases	Per cent
Blake and Sturgeon ²	16	3.3
Marshall, Meissner and Smith ¹⁰ (1948)	78	0.31
Joll ⁹	51	0.9
McSwain and Moore ¹²	—	0.75
Chesky, Drees and Hellwig ⁴	146	7.1
Graham (1931) ⁷	24	0.9
McClintock and Wright ^{11*}	50	—
Marshall and Meissner (present series)	114	0.36
Statland, Wasserman and Vickery ¹⁴	51	1.4

*4 of the 50 were the authors' cases.

stance were these symptoms marked. Pain was rarely recorded, and tenderness likewise was rarely noted.

Physical Findings. The thyroid enlargement is usually moderate in size, but in a few instances may become quite large, and a roentgenogram will show compression or deviation of the trachea. In most instances, the thyroid gland is symmetrically enlarged and the normal outlines of the lobes and isthmus are maintained. However, one lobe may be larger than the other and this inequality may be marked, giving the examiner the impression of a large single unilateral nodule; as a consequence, a preoperative diagnosis of adenoma was made in 16 instances. The gland is moderately firm, rubbery in consistency, and elevates easily upon swallowing. It has not the intense hardness or fixation of a Riedel's struma.

DIAGNOSIS

The correct diagnosis may often be overlooked preoperatively and, to a considerable extent, this is because *struma lymphomatosa* has not been considered by the examiner. The development of a firm goiter usually in a woman past the age of 40 should make one suspect *struma lymphomatosa*. Any enlargement of the thyroid gland, with retention of its normal contour, and not associated with pain, tenderness and thyrotoxic effects and without evidence of inflammation, is usually *struma lymphomatosa*. In this group of 114 cases, the diagnosis of chronic thyroiditis was made in only 20 patients. A diagnosis

TABLE III. Preoperative Diagnosis: 114 Cases of Struma Lymphomatosa.

Carcinoma.....	8
Adenoma.....	16
Multiple adenomatous goiter.....	70
Thyroiditis.....	20
Total.....	114

of multiple adenomatous goiter was made in 70 cases and, according to the literature, *struma lymphomatosa* apparently is most commonly confused with adenomatous goiter. Carcinoma was suspected in eight cases, in which marked asymmetry of the gland was present (Table III).

Because of firmness and occasionally rapid enlargement of the thyroid, carcinoma may be suspected. Enlargement due to *struma lymphomatosa* involves all portions of the gland without adherence to muscles, vessels and extra thyroid tissues; the contour of the gland is maintained, with sharp upper poles unchanged. Carcinoma appears as a hard and irregular thyroid enlargement; often it is associated with enlarged glands, and ordinarily it arises unilaterally and rarely from a previously uninvolved thyroid. We have one case of carcinoma in which there is bilateral involvement of the gland with thyroiditis. In such a case the final diagnosis has to be established by microscopic examination. Operations should be performed at once if carcinoma is suspected. Tests with roentgen-ray therapy to rule out *struma lymphomatosa*, as suggested by Joll, should be condemned.

THERAPY

Surgical Treatment. Many cases were found in our records in which a clinical diagnosis of thyroiditis had been made, but the patients were not operated upon, so that the accuracy of the clinical diagnosis could not be confirmed by microscopic examination of removed thyroid tissue. A considerable number of these cases can be recognized clinically by physicians experienced with thyroid disease, and the possibility of

TABLE IV. Type of Operation.

Total thyroidectomy.....	1
Subtotal thyroidectomy.....	82
Hemithyroidectomy.....	25
Excision of isthmus.....	5
Excision of pyramidal lobe.....	1
Total.....	114

thyroiditis should always be considered. If the goiter is not large, if there are few compression symptoms, and if there is no indication of malignant disease, operation can be avoided. Joll expressed doubt concerning the necessity for surgical treatment in cases of *struma lymphomatosa* if the pressure symptoms are mild. We agree with this if the clinical diagnosis is clear and if the goiter is not large or unsightly. Small goiters of this type without symptoms can be watched and surgical intervention postponed. It must be remembered, however, that the correct final diagnosis of *struma lymphomatosa* can be made only by pathologic examination.

The principal indications for surgical intervention are: (1) to determine by microscopic examination of thyroid tissue that the enlargement is not carcinoma; (2) to decompress the trachea and relieve pressure symptoms, and (3) for cosmetic effect when the goiter is large.

The correct diagnosis was made in only 17.5 per cent of this group of 114 cases but, in general, all these patients were operated upon because the clinical diagnosis was not clear. Many more patients in whom the diagnosis of chronic thyroiditis has been made are under the observation of the thyroid service; these patients are observed at regular intervals, and have not been submitted to surgical treatment. No data are available as yet in this group and, indeed, the type of thyroiditis would be difficult to classify accurately in these cases without pathologic examination. Eight patients were submitted to surgical procedures because carcinoma was suspected, and immediate frozen sections were obtained. Should op-

TABLE V. Comparison of Clinical Features of Struma Lymphomatosa.

	McClintock and Wright (1937) 47 Cases*	Joll (1939) 81 Cases†	Marshall and Meissner (1954) 114 Cases	Statland, Wasserman and Vickery (1951) 51 Cases
<i>Sex:</i>				
Male.....	4.2%	3.7%	1.7%	0.0%
Female.....	95.8%	96.3%	98.3%	100.0%
<i>Age:</i>				
Youngest.....	26 yrs.	10 yrs.	15 yrs.	10 yrs.
Oldest.....	75 yrs.	74 yrs.	82 yrs.	Not stated
Average.....	49.2 yrs.	57.6 yrs.	50.2 yrs.	44.2 yrs.
<i>Duration of Goiter:</i>				
Shortest.....	3 days	3 wks.	3 wks.	Not stated
Longest.....	16 yrs.	30 yrs.	30 yrs.	
Average.....	4.2 yrs.	4.2 yrs.	4.14 yrs.	
<i>Thyroid Involvement:</i>				
Bilateral.....	100%	100%	100%	100%
<i>Thyroid Function, Hypothyroidism</i>				
Preoperatively....	Not stated	35.2%	26%	Not stated
Postoperatively....	78.8%	64.8%	70%	82%

*Collected series: Authors' cases 4.
†Collected series: Author's cases 51.

eration be undertaken for this reason and the lesion prove to be *struma lymphomatosa*, we believe bilateral subtotal resection should be done. It is a much more effective method for the relief of tracheal constriction than is removal of the isthmus and suture of the prethyroid muscles to the trachea. Bilateral partial thyroidectomy is the preferred surgical procedure, and should be radical enough to relieve the compression as well as improve the cosmetic effect by removing an unsightly enlargement in the neck. It is conceded that if adequate bilateral resection of the gland is done, all of these patients will exhibit signs of thyroid deficiency earlier, but since hypothyroidism will develop in most of these cases regardless of the amount of tissue removed, or even if operation is not done, it is our opinion that best results can be obtained by a liberal, partial bilateral resection of the thyroid enlargement. There is little danger of injury to the parathyroid glands or to the recurrent laryngeal nerves, since there is very little extra thyroid involvement. The gland can be mobilized as easily as a simple colloid adenomatous goiter, and the vascularity is definitely decreased as compared to that of primary hyperthyroidism. Total thyroidectomy (Table IV) was done in only one case

in which carcinoma of the thyroid had been diagnosed erroneously. It is our opinion that total removal of the gland is unnecessary and undesirable, and may increase the danger of damage to the parathyroids and injury to the recurrent laryngeal nerves. Joll stated that ligation of the main thyroid arteries should be avoided. We have seen no difficulty arise from ligation of the superior and inferior thyroid arteries and, indeed, the operating technic is made easier by such ligation. A dry operative field naturally aids in preventing injury to the parathyroid glands and to the recurrent nerves.

Hemithyroidectomy was done in 25 cases, in 16 of which the asymmetry of the enlargement of the thyroid led to the diagnosis of adenoma. Hemithyroidectomy was thought to be sufficient in nine other cases in which the unremoved lobe was small, and therefore excision was not necessary. Once the diagnosis is established by exposure of the thyroid gland, however, we believe that bilateral resection is more desirable. Operative removal of only one lobe will often result in an asymmetrical fullness of the neck because of the firm lobe which has been allowed to remain.

The isthmus was removed in five cases to decompress the trachea, and for pathologic

TABLE VI. *Postoperative Hypothyroidism: Comparison of Struma Lymphomatosa and Toxic Goiter (Bartels).*

	No. of Cases	Myxedema	
		No.	Per cent
Struma lymphomatosa	114	80	70
Toxic goiter	942	49	5.3

diagnostic purposes. This is a very satisfactory procedure in patients with Riedel's struma because of technical difficulties associated with resection, and is probably satisfactory in cases of *struma lymphomatosa* in which the gland is small, but, as mentioned previously, pressure symptoms are relieved more completely by bilateral removal of the thyroid. Furthermore, the history of *struma lymphomatosa* is often one of steady progressive enlargement, which conceivably will require bilateral resection later. Pathologic examination of frozen sections is desirable and very helpful in those cases in which the true nature of the disease cannot be recognized grossly at the operating table, and will assist considerably in deciding the extent of the operative procedure that should be carried out.

Postoperative Complications. There has been no operative mortality in this group of patients. Operative complications are unusual and probably associated with the more radical operations which are performed when a mistaken diagnosis of cancer is made because of the gross appearance of the gland. Transient tetany was noted in two patients, and tracheotomy was required in three patients because of laryngeal edema associated with myxedema. Unilateral paralysis of the recurrent laryngeal nerve occurred in two patients. It is interesting to note that, in a previous report from this clinic by Cattell,³ 33 recurrent nerve injuries were found in 4795 thyroid operations for all types of disease performed in the period from 1942 to 1946, or an incidence of 0.69 per cent.

Irradiation Therapy. Roentgen-ray ther-

apy has been used in a moderate number of patients who were not submitted to operation either for resection or biopsy, and consequently no data are available in this group, since the type of thyroiditis was not established by microscopic examination. We believe that the additional fibrosis produced by the reaction to the irradiation tends to increase constriction of the trachea, and also further destroys the remaining secreting epithelium of the thyroid. Statland¹⁴ and his group observed four patients treated with irradiation and concluded that a dosage of 1200 r produced a marked regression in the size of the gland. We have seen regression in chronic thyroiditis (type undetermined) following roentgen-ray therapy, but pressure symptoms often remained unrelieved. Crile⁵ used doses of 1500 to 2000 r. He stated that *struma lymphomatosa* may be resistant to roentgen-ray therapy, but that 90 per cent of the patients responded to a combination of roentgen-ray therapy and large doses of thyroid extract (1 to 3 grains daily). Crile mentioned, however, that the thyroid remains firm because of fibrosis in the gland.

ACTH and cortisone therapy have been used in a few cases in the unoperated group, with relief of symptoms but with little or no change in the enlargement of the thyroid. Crile stated that the effect of cortisone may be transitory if large doses of thyroid are not given at the same time, and in one of his cases the enlargement increased when cortisone treatment was stopped. ACTH has been used in our group of subacute thyroiditis, with immediate relief of symptoms but no effect upon regression of the gland. We believe that caution should be used in employing this material over long periods of time, and that roentgen-ray therapy is preferable after initial relief of the acute distress has been obtained with cortisone or ACTH. It must be emphasized, however, that the symptoms subside in the majority of these cases, with regression of the subacute enlargement spontaneously in a few months without drug therapy.

FOLLOW-UP STUDY

The end result of surgical or irradiation treatment is hypothyroidism in a large percentage of cases. It is our observation that even if these patients are not treated, hypothyroidism will gradually develop. In our group, 30 patients (26.3 per cent) had preoperative basal metabolic rates ranging between -15 and -30 per cent. Spontaneous improvement with regression of the enlarged thyroid did not occur in any case. Eighty of the 114 patients required thyroid extract, an incidence of hypothyroidism of 70 per cent. This corresponds very closely to McClintock and Wright and Joll's series (Table V). Statland *et al.*, agree that myxedema occurs in a high proportion of cases; follow-up data were available in 29 of his patients, 24 of whom eventually required thyroid extract, and in most of them medication was instituted before obvious myxedema appeared. To a limited degree the appearance of hypothyroidism may depend upon the amount of thyroid tissue removed at operation, although this varies with length of time of observation after operation. In 19 of 25 patients (72 per cent) who had hemithyroidectomy, hypothyroidism developed, which is practically the same incidence of hypothyroidism as that after subtotal thyroidectomy (70 per cent). Hypothyroidism developed in four of the five patients who had biopsy or removal of the isthmus. Therefore, an operation which consists of hemithyroidectomy with preservation of one lobe does not alter the problem of hypothyroidism, and by no means removes the goiter or insures complete and lasting relief of the symptoms. This group of patients has been followed for from one to 15 years after operation. They have required one to three grains of thyroid daily for control of lowered thyroid function. Our experience has been similar to that of Statland, *et al.*, as most of our patients have had thyroid medication soon after operation to prevent myxedema, and have required

maintenance doses of thyroid extract ever since bilateral thyroidectomy. This incidence of hypothyroid function is in contrast to the incidence of postoperative myxedema following removal of a toxic goiter, as reported by Bartels¹ from this clinic.

In a group of 942 patients whose course could be followed postoperatively, there were 69 cases of myxedema (7.3 per cent); 13 patients (1.3 per cent) had transient myxedema, and 49 (5.2 per cent) had permanent myxedema. He stated that myxedema rarely occurred in patients with adenomatous goiter (in only three of the 69 cases). In Bartels' series, most of the patients with transient myxedema had the condition for one year or less. After the third year, myxedema can be considered to be permanent, and treatment will be required throughout the patient's life (Table VI). In our series, 62 of the 80 patients with hypothyroidism required thyroid extract for three years or more after operation, and could be considered as having permanent myxedema.

Recurrence of enlargement after operation was infrequent, and in view of reports in the literature regarding the effect of thyroid therapy on patients who have not had thyroid operations, this may account for the rareness of recurrence, since most of the patients require thyroid extract after operation. Seven patients had a second operation, only three could be said to have recurrent disease. An additional four patients had had hemithyroidectomy previously, apparently because the bilateral involvement of the thyroid was not recognized at the time of operation. In one patient enlargement of the pyramidal lobe developed after bilateral resection of the gland, which later required surgical removal.

SUMMARY

Struma lymphomatosa is an uncommon disease of the thyroid, and accounts for 0.36 per cent of all thyroid operations at the Lahey Clinic.

A series of 114 cases of *struma lymphomatosa* confirmed by operation and microscopic study is reported.

It is a disease of women; there were only two males in the 114 cases. It may occur at any age, the average age being 50.2 years.

The diagnosis is established by the clinical course of progressive enlargement of the thyroid, an elastic firmness associated with moderate pressure symptoms, and a lack of inflammatory reaction and of thyroid toxicity.

The pathologic features, grossly and microscopically, are described.

Treatment has consisted of bilateral subtotal thyroidectomy in 82 cases and hemithyroidectomy in 25. It is suggested that bilateral resection best relieves pressure symptoms and prevents tracheal constriction. Operation is associated with no mortality and few postoperative complications. Surgical treatment is not necessary in all cases, and should be avoided if the diagnosis is definite when symptoms are mild.

Postoperative hypothyroidism is common (70 per cent) and is permanent. Thyroid deficiency can be controlled by administration of thyroid extract, but treatment will be necessary throughout the patient's life.

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