—Original—

Surgical Therapy in Hashimoto's Thyroiditis

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Abstract

Hashimoto's thyroiditis (HT) is usually considered to be manageable by levothyroxine (L-T4) administration, which can reduce the thyroid volume and supplement the lack of hormone. However, we sometimes encounter a huge goiter that has not shrunk in response to L-T4 therapy. These goiters continue to produce symptoms of compression and an unsightly appearance. Here we discuss the surgical indication and procedure for HT.

Thirteen patients with clinically diagnosed Hashimoto's thyroiditis involving a huge diffuse goiter that produced pressure symptoms or nodular lesions were treated with surgery. The gender, age distribution, total dose and period of L-T4 administration prior to the operation, and clinical symptoms caused by the large goiter were evaluated in each case.

The titer of antibodies was extremely elevated in 8 HT patients with a diffusely enlarged goiter. The total period of L-T4 medication ranged from 6 to 25 years. A subtotal thyroidectomy in which a small amount of thyroid was left in the posterior area of the bilateral lobes was performed in the 8 cases of diffusely enlarged goiter. Pressure symptoms and the unsightly appearance caused by the goiter were relieved by the surgery in all cases. No surgical complications developed.

In conclusion, the surgery is an effective therapy for HT patients who have persistent compression symptoms and/or an unsightly neck appearance due to a large goiter despite long-term L-T4 treatment. (J Nippon Med Sch 2003; 70: 34–39)

Key words: Hashimoto's thyroiditis, surgical therapy, compression symptom, diffuse goiter

Introduction

Hashimoto's (chronic) thyroiditis (HT) is an autoimmune disease characterized by a thyroid that is diffusely enlarged to varying degrees. It is usually asymptomatic except when overt hypothyroidism is present. In Internal Medicine, this disease is generally considered to be manageable by levothyroxine (L-T4) administration, which can reduce the thyroid volume and supplement a lack of thyroid hormone. Accordingly, surgical therapy is usually contraindicated for HT, except in cases where the disease is associated with nodular lesions suggesting malignancy. However, we sometimes encounter a case of HT associated with a huge diffuse goiter that, despite long-term treatment with L-T4, has not shown an improvement in pressure symptoms and has an unsightly appearance in the anterior neck, with no reduction in goiter size.

The authors reviewed the cases of surgically treated HT in the Department of Surgery II,

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Table 1 Clinical data of diffusely enlarged Hashimoto's thyroiditis

Clinical data	1	2	3	4	5	6	7	8
Age/gender	56/F	71/F	57/F	62/F	53/F	81/F	65/F	55/F
Total dose (mg) of L-T4	220	550	330	0	50	460	70	370
Total period (y) of L-T4	6	10	9	0	1.5	25	4	10
Tg-Ab					46.9	0.3	696	9.9
TPO-Ab					30	18.2	2,720	0.3
Tg-test	409,600	409,600	160	102,400	400			
Mc-Test	1,638,400	409,600	1,600	6,400	25,600			

Tg-test: Thyroglobulin Antibody, Mc-test: Microsome Antibody

Division of Endocrine Surgery, Nippon Medical School. In this paper, we discuss the surgical indication for HT and report a safe surgical procedure for this disease that is based on our experience.

Subjects and Methods

Patients who visited the Nippon Medical School, Department of Surgery II, Division of Endocrine Surgery between April 1, 1977 and December 31, 2001 were reviewed. The subjects selected for this study were patients who underwent thyroid surgery despite a preoperative diagnosis of HT.

Data were collected on the ages, gender, autoantibodies, total dose and length of treatment with L-T4 prior to the operation, effectiveness of L-T4 medication on thyroid volume reduction, the operative procedure used, and any complications owing to the surgery.

Patients with a huge diffuse goiter that produced pressure symptoms were usually treated with a subtotal thyroidectomy that preserved a small amount of the posterior area of the bilateral lobes, to avoid operative injuries to the parathyroid glands and the recurrent laryngeal nerves. This technique is routinely applied at our institute for the surgical treatment of patients with Graves' disease. The external branch of the superior laryngeal nerve is carefully manipulated and preserved when the superior thyroid arteries are ligated. A subtotal or total lobectomy was performed in cases where nodular changes suggested a possible malignancy, i.e., follicular neoplasm.

Informed consent was obtained from all patients in whom L-T 4 replacement therapy was needed after the operation, as it was before they received surgery.

Results

During the period studied, 3,082 thyroid patients visited our outpatient clinic. Of the thyroid disorders detected in these patients, 462 patients (15%) were clinically diagnosed as HT. Thirteen (2.8%) of the HT cases were treated surgically. These 13 cases included 8 of diffusely enlarged and 5 of large nodular goiter. Of the 5 patients with large nodular goiter, three underwent hemithyroidectomy for cosmetic reasons and 2 received a nodulectomy for the purpose of pathological diagnosis. In the other 8 cases of diffuse goiter, the patients underwent a subtotal thyroidectomy to be relieved of pressure symptoms and/or an unsightly appearance.

Table 1 summarizes the clinical data of the 8 cases of diffuse goiter. All of the patients were women. The age at the time of the operation ranged from 53 to 81 years (mean: 62.5). All patients at the time of operation were in euthyroid state. The maximum total dose of L-T4 prior to the operation was 550 mg. Although the patient in case 4 did not receive L-T4 before the operation, her thyroid was markedly enlarged and her compression symptoms were quite severe at her first visit to our clinic. For the other 7 cases, the total period of L-T4 administration ranged from 1.5 years to 25 years (mean: 9.36). The titers of autoantibodies to the thyroid, Tg-Ab (thyroglobulin-antibody), TPO-Ab (thyroperoxidase antibody), Tg-test (thyroglobulin antibody), and Mc-test (microsome antibody), were all extremely elevated.

Table 2 Clinical symptoms of Hashimoto's thyroiditis with large diffuse goiter

Case	1	2	3	4	5	6	7	8
choking	3+	3+	3+	3+	3+	3+	2+	2+
dyspnea	2+	1+	1+	—	1+	1+	—	—
dysphagia	1+	1+	—	1+	1+	2+	—	—
unsightly	3+	3+	3+	2+	3+	3+	2+	3+
facial edema	—	—	—	—	—	—	—	—
hoarseness	1+	—	—	—	1+	—	—	—

3+: severe, 2+: moderate, 1+: mild, —: none
unsightly: unsightly appearance

Table 3 Operation

- Procedure: Subtotal thyroidectomy (8 cases)
- Weight of resected thyroid: 46～353g (mean: 236g)
- Complications: recurrent nerve paralysis (0)
  hypoparathyroidism (0)
- Operating time: 65～105 min (mean: 86 min)
- Blood loss: 15～150 m*l* (mean: 45 m*l*)

Table 2 indicates the preoperative clinical symptoms of the 8 patients with diffusely enlarged goiter. These symptoms have been reported by other authors[1–5] who operated on HT patients because of clinical compression symptoms.

All the patients in our study had complained of a severe or moderate choking sensation and/or an unsightly cosmetic appearance. Moderate dyspnea or dysphagia was present in 2 cases and mild forms of these symptoms were present in 4 cases. Mild hoarseness was noted in 2 cases, but facial edema was not recognized in any of them.

Table 3 summarizes the results of surgical therapy for the 8 cases of diffusely enlarged goiter. All these patients underwent a subtotal thyroidectomy. The weight of the surgical specimens ranged from 46 to 353 grams (g) with a mean of 236 g. No complications, such as recurrent nerve paralysis or postoperative hypoparathyroidism, had developed by the time of this report. The operating time ranged from 65 to 105 min with a mean of 86 min. The amount of bleeding ranged from 15 to 150 ml with a mean of 45 ml.

Fig. 1 (a, b, c) shows the preoperative picture of the huge diffuse goiter in case 6 (a) and the CT findings (b, c). In the neck CT, it can be seen that the right lobe of the thyroid at the level of the hyoid bone compressed the larynx and the esophagus from the right side and back, while displacing these organs to the left and forward (picture b). Furthermore, the enlarged diffuse goiter bilaterally compressed the esophagus from both sides, as seen in picture (c), which produced a severe choking feeling and dysphagia as well as a marked unsightly appearance in the patient. This huge goiter had not been reduced in size even though the patient had been taking L-T 4 for 25 years. She had suffered from these symptoms for a long time.

Fig. 2 (a, b, c) shows the operative findings (a, b) and resected specimen (c) from case 6. The right lobe of the thyroid is being mobilized from the trachea in picture (a). The right recurrent nerve and the right parathyroid gland are clearly visible. The picture in (b) shows the operative field after completion of the subtotal thyroidectomy. The small amount of remnant thyroid was preserved and sutured to the lateral side of the trachea. The parathyroid gland was also preserved. Thus, the operative manipulation did not threaten the recurrent nerve by approaching it too closely. As a result, the complications mentioned above did not develop at all. The picture in (c) shows the surgical specimen, a markedly enlarged diffuse goiter weighing 292 g and measuring 118×72 mm (right lobe) and 105×70 mm (left lobe).

Fig. 3 shows the postoperative macroscopic appearance of the anterior neck in case 6. The clinical symptoms and unsightly cosmetic appearance were vastly improved.

Discussion

HT was named after Hakaru Hashimoto[6], who presented the first pathological report of struma lymphomatosa in 1912. At present, HT is generally

Fig. 1 (a, b, c) Pre-operative findings in case 6. The patient had a huge diffuse goiter (a) that compressed and deviated the trachea to the left at the level of the hyoid bone (b) and compressed the esophagus bilaterally (c).

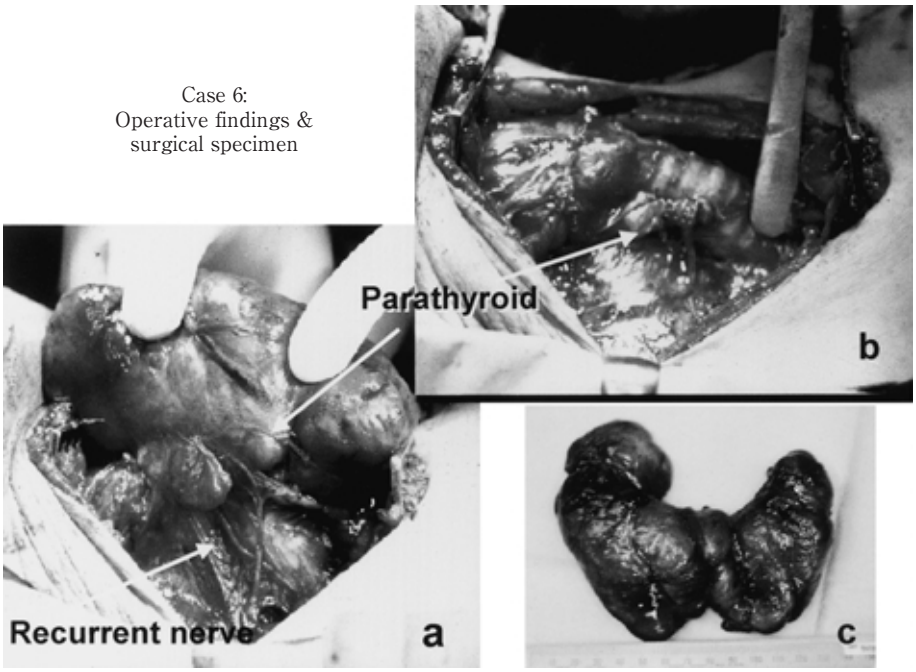

Fig. 2 (a, b, c) Operative findings and surgical specimen in case 6. The right lobe was mobilized from the trachea (a) and a subtotal thyroidectomy was performed that preserved a small amount of the posterior part of the thyroid (b). In this procedure, the recurrent nerve and the parathyroid gland are identified and preserved (a, b arrows). Picture (c) is the resected specimen.

Case 6:
Postoperative macroscopic appearance

Fig. 3 The anterior neck after surgery in case 6. The unsightly appearance and compression symptoms were markedly improved.

known as an autoimmune disease presenting as a diffuse goiter with varying degrees of consistency, size, and shape. The principal approach for treating HT is to give L-T4 to replace the thyroid hormone and/or to reduce the volume of the enlarged diffuse goiter, even if it is in the euthyroid state. Therefore, HT is excluded from the category of diseases requiring surgical therapy. Surgical intervention is conducted routinely in HT cases only when an associated malignant lesion is suspected or an excisional biopsy is needed to make an accurate diagnosis of malignant lymphoma, which commonly develops from HT.

However, some reports describe a surgical indication for diffusely enlarged goiter in HT cases without nodular lesions. In one of these reports, Kirillov et al[5] listed pressure symptoms, ineffectiveness of conservative treatment, and the risk of cancer complication as reasons for the operation. Gyory et al[4] also listed trachea/esophagus compression symptoms as well as a suspicion of malignancy. The incidence of malignancy complications associated with HT was reported by Singh et al[7], who noted an increased prevalence of HT in patients with papillary thyroid carcinoma. On the other hand, Clark et al[1] reported that the cancer risk of nodular lesions in HT is very low. Thus, the incidence of the coexistence of malignancy and HT is still controversial.

Surgery has also been used to relieve compression symptoms induced by diffuse goiter in the absence of a cancer risk. Clark et al[1] reported the use of surgical therapy for 21 of 75 HT cases of diffusely enlarged goiter without nodular complications to reduce the symptoms of dysphagia, localized pain and tenderness, hoarseness, tightness in the neck, choking, and referred pain in the face and ear. Thomas et al[2] described the surgical indication for HT as being an incomplete regression of the dominant mass coupled with progression of thyromegaly despite TSH suppression therapy. Lindem et al[8] also described 21 out of 41 cases in which this malady was surgically treated to relieve pressure to the esophagus, trachea, recurrent nerve, or carotid artery.

In our study, in 5 of 13 cases of HT there was a nodular lesion for which malignancy could not be completely excluded; therefore, nodulectomy or lobectomy was carried out. However, the surgical indication for the other 8 cases was simply the presence of a diffusely enlarged goiter with no nodules, similar to the indications reported previously[1–5], except the patients in our study did not have localized pain and tenderness. Such patients are commonly treated with L-T4, as mentioned earlier. However, despite long-term treatment with L-T4 for all 8 patients except case patient 4, these patients suffered from choking due to compression, and an unsightly appearance; some patients also complained of dyspnea, dysphagia, and hoarseness. The surgical therapy for these diffuse goiter cases was a subtotal thyroidectomy, which resulted in satisfactory improvement of both the compression symptoms and the cosmetic appearance, without any complications. Malignancy was not associated with any of the HT cases in this study, based on careful pathological examination.

Chonkich et al[9] recommended total thyroidectomy as the operative procedure for HT, because the occasional presence of hardened nodular lesions makes it difficult to make a differential diagnosis of malignancy; thus, the total removal of the thyroid avoids the potential need to reoperate[9]. Catz et al[10] also recommended total thyroidectomy because of a high incidence of cancer associated with HT[10]. However, a certain percentage of patients treated with total thyroidectomy for HT develop complications such as recurrent nerve palsy and hypoparathyroidism[4].

An important goal of the surgical therapy for diffusely enlarged HT is the complete avoidance of

surgical complications. Our subtotal thyroidectomy procedure, which leaves a small amount of thyroid tissue at the posterior area of the bilateral lobes, is a feasible, safe, and practical technique. In fact, at the time of this writing, no complications have developed in any of the patients who underwent this procedure in this study.

Compared with Graves' disease, the operative manipulation is easier in HT. In HT with extremely elevated titers of autoantibodies, which was true in all 8 of our cases, the whole area of the diffuse goiter has a hard and elastic consistency. This property enabled us to manipulate the superior and inferior poles of the thyroid much easier than in Graves' disease. In addition, the goiters in HT showed a much lower tendency to bleed than is observed in Graves' disease.

Finally, we wish to reemphasize the following points. In HT cases in which a huge, diffusely enlarged goiter continues to produce a range of clinical symptoms despite a long period of L-T4 administration, surgical intervention should be considered. Such patients need to take L-T4 for the rest of their lives regardless of whether they receive surgical or conservative therapy. Although a diffuse goiter that, despite repeated steroid administration, causes persistent pain and tenderness due to destructive thyroiditis is rarely encountered in HT, we agree with the surgical indication for such cases given by Clark et al[1].

We found no relationship between the total dose of L-T4 and the reduction in goiter size or the improvement of clinical symptoms in the HT patients who did not respond to L-T4 (**Table 2**). These findings suggest that long-term L-T 4 treatment in the absence of improvement is not helpful and should be avoided in favor of earlier surgery. Although it is not clear how long the maximum period of L-T4 administration should be needed before the decision to perform surgery is made, it is clear that such patients have to be observed very carefully with a view of taking surgical therapy.

Further studies with a larger number of patients and more quantitative analyses will be essential to better pinpoint the cases where surgery for HT would be most beneficial.

In conclusion, we have treated 8 HT patients with diffusely enlarged goiters with surgery, which was very effective in improving oppressive symptoms and cosmesis. A subtotal thyroidectomy in which a posterior portion of the bilateral lobes was preserved avoided postoperative complications.

The following clinical symptoms due to a large goiter are considered to be a surgical indication for HT :

1. The presence of compression symptoms and/or their progression due to thyromegaly despite suppressive therapy.
2. An ineffectiveness of conservative therapy for cosmetic improvement.

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