Carcinoma of the Thyroid Gland

—A Retrospective Investigation of 75 Patients—

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Summary: A retrospective review was completed of 69 patients treated at Kurume University Hospital from 1971 to 1980 for carcinoma of the thyroid gland. Sixty-one cases underwent curative treatments and 8 were subjected to palliative treatments. The results of this retrospective study are summarized as follows: (1) In the patients of curative treatments, 5-year and 10-year cumulative survival rates calculated by the actuarial method were 76.8% and 63.0%, respectively. (2) The factors which presented significant influences on the prognosis were age, histological type and surgical treatment. (3) All of the undifferentiated carcinoma cases died from primary lesion. (4) The patients over 65 years old tended to present lower survival rates than did the younger patients. (5) In both of the 2 cases of isthmus carcinoma which was treated by a localized removal, a local recurrence developed.

Key words: carcinoma — thyroid gland — carcinoma of thyroid gland — survival rate — cause of death

Introduction

Carcinoma of the thyroid gland can be divided into two major histological types which are markedly different in prognosis: undifferentiated and differentiated types. The former presents very poor prognosis while the latter can be rather easily controlled. The majority of the cases reviewed in this paper are carcinomas of differentiated types.

Okada et al. (1976) previously reviewed 51 cases treated at Kurume University Hospital between 1960 and 1973. The crude 5-year survival rate was 65.0%. There were 16 deaths of which 7 were from the primary tumor, 7 from distant metastasis, and 2 from intercurrent diseases. On the basis of these results, we felt it was necessary to evaluate our endeavors and to determine if improved treatments of the primary lesion increased the survival rate. It

was, therefore, the purpose of this paper to review the cases treated between 1971 and 1980, to relate histological type and age to prognosis, and to discuss varying treatments, in order that we might obtain some suggestions for the future improvement in managing this disease.

Materials and Methods

During the 10 year period between January 1, 1971 and December 31, 1980, 166 patients with thyroid gland disease were treated at the Department of Otolaryngology, Kurume University Hospital. Eighty-two patients had malignant neoplasm, 64 benign neoplasm and, 20 non-neoplastic diseases such as hyperthyroidism or thyroiditis (Table 1). In 7 of 82 malignant cases, no histological diagnosis was available. The classification of histological types

TABLE 1
Histological types of 166 cases of thyroid gland disease (1971-1980)

	Histological type	sex		Total
		Male	Female	
Benign neoplasm	Follicular adenoma	7	48	55
	Adenomatous goiter	0	9	9
Malignant tumor	Papillary carcinoma	6	45	16
	Follicular carcinoma	4	12	16
	Medullary carcinoma	0	1	1
	Undifferentiated carcinoma	2	5	7
	No histological diagnosis available*	3	4	7
Inflammation (Thyroiditis)		1	7	8
Hyperthyroidism		4	8	12
Total		27	139	166

* All these 7 cases were clinically malignant.

is based on the general rules for the description of thyroid neoplasms proposed by the Japanese Society of Thyroid Surgery (1977). In this paper, we will review 75 patients with histologically proven malignant neoplasm.

Of these 75 patients, 69 had received no previous treatment whereas 6 were previously treated at other clinics. Among the former 69 patients, 61 were curatively treated at our hospital and the other 8 were subjected to palliative treatments. Of those patients receiving treatment elsewhere, 5 were curatively treated and the other patient received palliative treatment.

Table 2 presents a distribution of 75 patients by sex and age. There were 11 males and 64 females. Thus, the number of females was greater than that of males. The ratio of males to females was approximately 1:6. The age of the 75 patients ranged from 21 to 79 with a mean age of 57 years. The average age were 44 years with a range from 11 to 75 years for benign neoplasms and 39 with a range from 11 to 76 years for non-neoplastic lesions. Fig. 1. presents the distribution of the 166 cases of thyroid diseases by age. There was a marked difference in the peak age of occurrence between benign diseases and malignant neo-

TABLE 2
Distribution of 75 patients of carcinoma of the thyroid gland by sex and age

Age group	Male	Female	Total (%)
20-29	1	6	7 (9)
30-39	1	5	6 (8)
40-49	0	8	8 (11)
50-59	3	11	14 (19)
60-69	4	18	22 (29)
70-79	2	16	18 (24)
Total	11	64	75 (100)

Fig. 1. Distribution of 166 thyroid gland disease by age

TABLE 3

Distribution of 69 cases by histological diagnosis and T and N categories

Histological types	T \ N	N				Total
		N0	N1	N2	N3	
Papillary ca.	T1	11	1	0	0	12
	T2	7	5	0	0	12
	T3	3	2	1	1	7
	T4	8	4	1	3	16
Follicular ca.	T1	6	0	0	0	6
	T2	3	0	0	0	3
	T3	0	1	0	0	1
	T4	1	2	1	0	4
Medullary ca.	T1	1	0	0	0	1
Undifferentiated ca.	T3	1	0	0	0	1
	T4	3	2	0	1	6
Total		44	17	3	5	69

plasms of the thyroid gland. Benign diseases occurred most frequently in the fourth decade while malignant neoplasms occurred in the seventh decade.

Table 3 presents the distribution of the 69 primary cases by histological types and T and N categories. TNM categories were based on the UICC TNM classification (UICC, 1978). Among the entire group of 69 cases, 47 (68 %) cases were papillary carcinoma, 14 (20 %) follicular carcinoma, one medullary carcinoma and 7 (10 %) undifferentiated carcinoma. With respect to T category, there were 19 T1 (28 %), 15 T2 (22 %), 9 T3 (13 %) and 26 T4 (38 %) cases. Forty-four cases (63 %) were staged N0, 17 (25 %) were N1, 3 (4 %) were N2 and 5 (7 %) were N3. All 69 cases were staged M0.

Follow up examinations were indicated twice a month during the first 6 months, once a month during the following 6 months, once every 2 months during the second year, once every 3 months during the third year, once every 1/2 to 1 year after the third year. Questionnaires were used to determine the status of those patients who did not return to their scheduled

follow up examinations. Analysis of the results of the treatments were based on patient status as of May 31, 1981.

Results

The results will be presented chiefly for those 61 patients who underwent curative treatment for the first time at our hospital. The results of those patients treated with palliative methods or cases that had been previously treated elsewhere are discussed separately and described in the latter part of this paper.

1. Survival rate

The cumulative survival rate of the 61 patients is presented in Fig. 2. It was calculated by the actuarial method (UICC, 1974). The onset chosen to compute survival rate is the date of hospitalization which generally coincided within a few days of initiation of treatment. The 5- and 10-year cumulative survival rates were 76.8 % and 63.0 % respectively. For the 56 patients with differentiated carcinoma, 5-year and 10-year cumulative survival rates

Fig. 2. Cumulative survival rate calculated by the actuarial method. 61 cases treated in 1971-1980.

* One patient died from heart disease 5 years and 6 months after initial treatment.

** One patient died from natural death 8 years and 9 months after initial treatment.

Numbers in parentheses are the cumulative survival rates for differentiated carcinomas.

TABLE 4

Five-year cumulative survival rates (in per cent) calculated by the actuarial method for 61 patients curatively treated for the first time between 1971 and 1980.

		No. of pt.	5-year
Histological types	Papillary ca.	42	78.8
	Follicular ca.	13	88.9
	Medullary ca.	1	100.0
	Undifferentiated ca.	5	0
T*	T1	19	80.2
	T2	15	90.9
	T3	8	62.5
	T4	14	75.0
N*	N0	37	78.7
	N1	14	74.1
	N2 and 3	5	**

* Five undifferentiated carcinoma cases are excluded.

** Cumulative survival rate was not available since all surviving patients withdrew before the year indicated.

were 84.2 % and 72.6 % respectively. As will be shown later, all deaths caused by the tumor present occurred within five years from the beginning of the treatment. The decrease in survival rate from the end of the 5th year to the end of the 10th year resulted, primarily from deaths from intercurrent diseases.

Table 4 compared 5-year survival rates by histological types and T and N categories. With respect to the histological types, the 5-year cumulative survival rates was 78.8 % for papillary carcinoma, 88.9 % for follicular carcinoma, 100 % for medullary carcinoma and 0 % for undifferentiated carcinoma. All 5 cases of undifferentiated carcinoma died within a year. Concerning T category, the survival rate was slightly higher for T1 and T2 than for T3 and T4. With respect to N category, there was no marked difference in survival rate between N0 and N1. Five-year survival rate was not available for N2 and N3. There were two cases of N2: one case died within 3 years from the onset of the first surgery and the other was alive but withdrew by

the beginning of the fourth year. Of the three cases of N3, one died within one month after initial surgery whereas the remaining two withdrew by the beginning of the second and the fifth year, respectively.

Table 5 presents 5-year cumulative survival rates calculated by the actuarial method for 3 different age groups. The survival rate was the lowest for the oldest age group whereas the survival rate at 5 years was 100 % for the patients under 50 years of age. Noteworthy is the fact that 4 cases of undifferentiated carcinoma belonged to the age group over 66 years of age and one to the age group of 51-65 years. However, even when the cases of undifferentiated carcinoma were excluded from the data the lower survival rate for the older age group was still obvious. Additionally, when the survival rates were compared to the expected survival rate for each age group, there was still the tendency that the prognosis became poorer as the age became older.

TABLE 5

Five-year cumulative survival rates (in per cent) calculated by the actuarial method for three different age groups.

Age group	T	No of pt	Calculated	Expected
Under 50	T1	7	100.0	98.0
	T2	5		
	T3	2		
	T4	3		
50 - 65	T1	9	84.4 (88.2)	92.5
	T2	6		
	T3	2		
	T4	8(7)		
Over 65	T1	3	34.1 (43.4)	65.0
	T2	4		
	T3	6(5)		
	T4	5(2)		

The numbers in parentheses present the data for well differentiated carcinoma excluding 5 cases of undifferentiated carcinoma.

2. Cause of death

The cause of death was classified and defined as follows:

(a) Death from primary lesion (T). Patients who died with primary lesion uncontrolled with or without neck and/or distant metastasis were classified into this category.

(b) Death from neck metastasis (N). Patients who died with neck metastasis uncontrolled, with primary lesion controlled with or without distant metastasis were classified into this category.

(c) Death from distant metastasis (M). Patients who died with distant metastasis with primary and neck controlled were classified into this category.

(d) Surgical death. Patients who died within 30 days after major surgical treatment were classified into this category.

(e) Death from complication. Patients who died of complication caused by any therapeutic intervention were classified into this category. Surgical death is one kind

of death resulting from complications. In this paper, surgical death is described separately from those occurring from other complications.

(f) Unknown. Dead patients of whom no information about the cause death was available were classified into this category.

(2) Death from intercurrent disease.

Patients who died of intercurrent disease and had no evidence of the carcinoma present were classified into this category.

This definition is primarily based on the proposal by the Japan Society of Head and Neck Tumor (1981). The deaths from primary, neck metastasis and distant metastasis were defined according to Hirano et al. (1976).

Table 6 shows the cause of death of 17 patients. Fourteen (82 %) died of the tumor present and 3 (18 %) of intercurrent disease. The cause of death was primary lesion in 8 (47 %), distant metastasis in 2 (12 %) and surgical or other complications in 4 (24 %). Ten patients (59 %) died with-

TABLE 6
Cause of death by number of years of survival for 17 patients
undergoing curative treatments.

cause year*	Death from tumor				Intercurrent disease	Total
	T	M	Surgery	Complication		
0-1	6	0	3	1	0	10
1-2	2	0	0	0	0	2
2-3	0	1	0	0	1	2
3-4	0	1	0	0	0	1
4-5	0	0	0	0	0	0
5-6	0	0	0	0	1	1
6-7	0	0	0	0	0	0
7-8	0	0	0	0	0	0
8-9	0	0	0	0	1	1
9-	0	0	0	0	0	0
Total	8	2	3	1	3	17

* Year after the onset of treatment

T : Death from primary lesion

M : Death from distant metastasis

TABLE 7
Causes of death by histological types, T and N categories

		No. of pt.	Death from tumor				Intercurrent disease	Total
			T	M	Surgery	Complication		
Histological types	Papillary ca.	42	3	0	3	1	2	9
	Follicular ca.	13	0	2	0	0	1	3
	Medullary ca.	1	0	0	0	0	0	0
	Undifferentiated ca.	5	5	0	0	0	0	5
T*	T1	19	2	1	0	0	0	3
	T2	15	0	1	0	0	1	2
	T3	9(1)	1 (1)	0	1	1	2	5(1)
	T4	18(4)	5 (4)	0	2	0	0	7(4)
N*	N0	41(4)	6 (4)	2	1	0	1	10(4)
	N1	14	0	0	1	0	2	3
	N2 and 3	6(1)	2 (1)	0	1	1	0	4(1)

* Number in parentheses is that of undifferentiated carcinoma

TABLE 8
Types of treatment for the primary tumor by incidence of local recurrence and cause of death of 56 cases of well differentiated carcinoma

Types of surgery	No. of pt. *	Local recur- rence	alive	dead	Cause of death				Intercurrent disease
					T	M	Surgery	Compli- cation	
Partial thyroidectomy	2(2)	2	0	2	1	1**	0	0	0
Hemithyroidectomy	33(28)	1	28	4	0	1	1	0	2
Hemithyroidectomy plus radiation	3(3)	1	2	1	1	0	0	0	0
Subtotal thyroidectomy	10(9)	1	10	0	0	0	0	0	0
Total thyroidectomy	8(4)	1	3	5	1	0	2	1	1

* Number in parentheses indicates number of patients where death occurred within 2 years from causes other than primary tumor and patients who withdrew alive within 2 years are excluded (10 patients in total are thus excluded).

** This patient developed pulmonary metastasis following repeated recurrences at the primary site and neck.

in one year, 12 (71 %) within two years and 14 (82 %) within three years. All the 14 deaths caused by the tumor present took place within four years of initial treatment. There were no deaths from neck metastasis.

Table 7 presents distribution of the cause of death by histological types and T and N categories. All five cases of undifferentiated carcinoma died from primary lesions. The remaining 3 deaths from primary lesions

and all of the 4 deaths from complications occurred in papillary carcinoma cases whereas both deaths from distant metastasis resulted from follicular carcinoma. There was no relationship between the cause of death and T and N categories in the cases of differentiated carcinoma.

3. Control of primary tumor

Table 8 presents the type of treatment

for the primary tumor by frequency of local recurrence and the cause of death.

The types of surgery were classified into 4 groups:

(1) Hemithyroidectomy. This was indicated when the carcinomatous lesion was localized within one lobe of the thyroid gland.

(2) Partial thyroidectomy. When carcinoma was localized in the isthmus, it was removed with some safety margin. In this paper, this procedure is referred to as a partial thyroidectomy.

(3) Subtotal thyroidectomy. When the thyroid lobe on the contralateral side was partially involved, major portion of the thyroid gland was removed.

(4) Total thyroidectomy. For more advanced cases, the entire thyroid gland was removed.

There were 6 cases of local recurrence. In five (83 %) of the 6 cases, local recurrence took place within 2 years after the onset of treatment. The only exception was

a case who developed local recurrence 4 years and 1 month after the onset of treatment. In order to present meaningful data on the rate of local recurrence, cases dead within 2 years from causes other than local recurrence and surviving cases which were less than 2 years post initial treatment should be excluded from the analysis. Consequently, in Table 8, the number of patients after these exclusions is indicated in parentheses. As seen from this Table, there were 2 (100 %) local recurrence in partial thyroidectomy. Subtotal or total thyroidectomy should have been indicated for these isthmus lesions. Three of the 6 patients who developed local recurrence died from the primary lesion, 2 are alive with the local recurrence suppressed with hormone therapy and 1 died from distant metastasis with local tumor surgically controlled.

Table 9 presents the incidence of local recurrence by type of surgery for the primary tumor and T category. No significant relationship was observed between the T category.

TABLE 9
Type of surgery for the primary tumor and incidence of local recurrence of 56 surgical cases

	T	No. of pt.*	Local recurrence
Partial thyroidectomy	T3	2 (2)	2
Hemithyroidectomy	T1	16 (13)	1
	T2	12 (12)	1
	T3	2 (2)	0
	T4	6 (4)	0
Subtotal thyroidectomy	T1	1 (1)	0
	T2	3 (2)	0
	T3	4 (4)	1
	T4	2 (2)	0
Total thyroidectomy	T3	3	1
	T4	5 (1)	0

* Number in parentheses indicate number of patients where death occurred within 2 years from causes other than primary tumor and patients who withdrew alive within 2 years are excluded (10 patients in total are thus excluded).

4. Control of neck metastasis

As shown in Table 10, there was evidence of cervical lymphnode involvement in 20 patients on the affected side. For all patients with evidence of node involvement, radical neck dissection (RND) was executed. RND was also done in 9 of the 36 patients who presented no evidence of node involvement on the affected side. Of these 9 patients, 2 underwent RND with the internal jugular vein preserved whereas 7 had extirpation of the lymphnodes only.

Table 11 presents frequency of cervical recurrence. On the affected side, 4 patients developed cervical recurrence. One patient who had lymphnode extirpation at the initial treatment developed cervical recurrence associated with primary recurrence. Subtotal thyroidectomy and radical neck dissection was performed. The other 3 had no RND at the initial treatment and developed cervical recurrence without recurrence at the primary site. They should have had latent metastasis. There was no death from neck metastasis. The interval between the onset of treatment and the cervical recurrence was less than 1 year in 3 (75 %), 1 to 2 years in 1 (25 %). Thus, 75 % of cervical recurrence occurred within 1 year.

One of the ways to estimate the rate of occult neck metastasis is to examine the incidence of cervical recurrence without local recurrence in patients who had negative nodes and but who did not undergo RND. In this instance, the patients who died or withdrew within 1 year without having neck recurrence should be excluded from the data. The rate of latent neck metastasis estimated in this way was 3 out of 26 (12 %) on the affected side.

TABLE 10
Condition of cervical lymphnodes in 56 patients of differentiated carcinoma and execution of RND

Side	Evidence of node involvement	RND	
		Done	Not done
Affected	Present (N = 20)	20*	0
	Absent (N = 36)	9**	27
Unaffected	Present (N = 0)	0	0
	Absent (N = 56)	0	56

* In 1 case, extirpation of lymphnodes only was performed.

** In 2 cases, RND was performed with the internal jugular vein preserved and extirpation of lymphnodes only was done in the remaining 7.

TABLE 11
Recurrence of cervical lymphnodes

	Previous RND	Recurrence of primary	No. of cases of cervical recurrence	Final status
Affected side	Done*	Absent	0	1 controlled
		Present	1*	
	Not done	Absent	3**	3 controlled
		Present	0	

* In this case, lymphnode extirpation alone was initially performed. The recurrence was controlled with subtotal thyroidectomy and radical neck dissection.

** These 3 cases probably had latent neck metastasis.

5. Analysis of distant metastasis

There were 2 patients who developed distant metastasis, both being cases of follicular carcinoma. Fig. 3 presents an outline of these patients. The metastasis was diagnosed only by X-ray examination in both cases. The location of metastasis was the lung in one case and the fifth and sixth thoracic vertebrae in the other. One patient developed the distant metastasis without local and cervical recurrence. The other developed recurrences of the primary and neck which were surgically controlled. Following this she developed lung metastasis and died from it. The interval from the onset of treatment to the first recognition of the distant metastasis was 2 years and 10 months and 2 years and 3 months respectively.

6. Analysis of surgical death and complication

Three patients died from surgical complication and 1 from other complications. An outline of these cases were summarized in Fig. 4. Surgical death was caused by bleeding resulting from rupture of the common artery in 1 case and pneumonia in 2. Another fatal complication was pneumonia. In this case, necropsy revealed residual neck tumor and diffuse metastatic papillary carcinoma in the lung.

7. Analysis of fatal intercurrent disease

Three patients died of an intercurrent disease. Fig. 5. presents an outline of these patients. One died from natural death at the age of 76 and two died of heart disease.

Fig. 3. Outline of patients who died from distant metastasis

H : Hemithyroidectomy RND : Radical neck dissection
 T : Total thyroidectomy ○ : Distant metastasis recognized
 PT : Partial thyroidectomy ● : Died × : Recurrence

Fig. 4. Outline of patients who died from surgery and complications

P E : Pharyngoesophagotomy T : Total thyroidectomy
 S T : Subtotal thyroidectomy RND : Radical neck dissection

Fig. 5. Outline of patients who died from intercurrent disease

L : Hemithyroidectomy T : Total thyroidectomy
RND : Radical neck dissection

TABLE 12

Analysis of palliative treated 8 cases

Case	Age	Sex	T NM	Histological type	Therapy	Results
P - 1	71	Female	T4N3M0	Papillary ca.	Radiation ^{60}Co 4200rad	Alive, 7 years and 3 months
P - 2	71	Female	T4N0M0	Papillary ca.	Partial removal	Alive, 5 years and 2 months
P - 3	75	Female	T4N0M0	Papillary ca.	Radiation ^{60}Co 5400rad	Alive, 3 years and 2 months
P - 4	56	Male	T4N1M1	Undifferentiated ca.	Tracheostomy only	Died, 2 months
P - 5	69	Male	T4N1M0	Undifferentiated ca.	Tracheostomy only	Died, 2 months
P - 6	68	Female	T4N2M0	Follicular ca.	Tracheostomy only	Died, 2 years and 11 months
P - 7	61	Female	T4N0M0	Papillary ca.	Partial removal	Died, 1 year and 7 months
P - 8	75	Male	T4N1M0	Papillary ca.	Partial removal	Died, 4 years and 5 months

TABLE 13

Analysis of previously treated 6 cases

Age	Sex	Histology	Previously treatments	Treatment in our hospital	Results
40	Female	Papillary ca.	Partial thyroidectomy	Total thyroidectomy, tracheal wall resection	Alive, 7 years and 2 months
78	Female	Papillary ca.	Surgery*	Tracheal fenestration plus hormone therapy	Alive, 7 years and 1 month
78	Female	Papillary ca.	Hemithyroidectomy	Tracheal fenestration plus laser operation	Alive, 6 years and 3 months
27	Female	Papillary ca.	Hemithyroidectomy	Radical neck dissection	Lost to follow up
48	Female	Follicular ca.	Surgery*	Tracheotomy only	Died, 1 year and 5 months
71	Female	Papillary ca.	Total thyroidectomy	Radiation	Died, 8 months

* No information on the type of surgery was available.

8. Analysis of palliative cases

For various reasons, 8 of the 69 patients were treated palliatively. These cases are summarized in Table 12. Seven patients were inoperable cases because of advanced lesions. Of these 7, 3 underwent partial removal of the tumor, 3 tracheostomy only, and 1 palliative radiation therapy. One patient (Case P-1) refused radical surgery and underwent palliative radiation. Thyroid hormone therapy was applied to all these 8 cases.

Of these 8 patients, 5 died from the tumor present whereas 3 are currently alive for 3 years and 2 months, 5 years and 2 months and 7 years and 3 months respectively after the initial palliative treatment.

9. Analysis of previously treated cases

Six cases were previously treated at other hospitals. The outline of these cases is summarized in Table 13. Two patients had had hemithyroidectomy, 1 patient partial thyroidectomy and 1 patient total thyroidectomy as the previously treatment. The other 2 patients also had had surgery, but no information on the type of surgery

was available. Of these 6 cases, 2 died from the tumor present, 3 are currently alive 6 or more years post treatment and 1 was lost to follow up 6 months after the surgical treatment in our hospital.

Discussion

Carcinoma of the thyroid gland can be divided into two major histological types which are markedly different in prognosis: undifferentiated and differentiated types. The former presents very poor prognosis while the latter can be rather easily controlled. The results of the present retrospective review confirm these previously reported difference in prognosis between these two histological types. All five cases of undifferentiated carcinoma died from primary lesion.

Table 14 shows the survival rate for carcinoma of the thyroid gland reported in some literature. The results of the present review present slightly lower survival rates compared to those reported by other authors. A possible reason for this is the fact that there were many advanced cases

TABLE 14
Survival rate reported in literature

Authors		No. of pt.	5-year	10-year	Method of calculation
Buckwalter (1961)	Well differentiated	166		37.3 (male) 77.6 (female)	Berkson's method
Woolner (1961)	Papillary ca. Follicular ca.	471 129	93.3 84.9	82.0 72.0	Berkson's method
Inagaki, H. (1968)	Papillary ca. Follicular ca.	80 31		84.2 100.0	Berkson's method
Crile et al (1971)	Papillary ca.	102	95	86.0	Berkson's method
Okada et al (1976)	Thyroid ca.	20		65.0	Direct method
Mazzabberri et al (1977)	Papillary ca. Follicular Medullary	576	97.8	94.9	Cumulative survival rate

and also there were a considerable number of patients of old ages. In the present review, it was shown that the prognosis became poor as the age was increased.

With respect to surgical technique, it should be emphasized that isthmus lesions call for an extensive surgical removal. Both of our 2 patients of an isthmus lesion died because the extent of the initial surgical removal was insufficient.

The results of the present review confirmed the effectiveness of thyroid hormone therapy which aimed at a suppression of TSH.

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