Malignant Tumor of the Faucial Tonsil
—Clinical Evaluation of 28 Cases—

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Malignant tumor of the faucial tonsil such as cancer, lymphreticular sarcoma and Hodgkin's disease are not an unusual feature for otolaryngologist. Many literatures such as case reports, pathological or clinical evaluations are reported by not noly otolaryngologist but rentgenologists.

Though it is generally accepted that radiation therapy is the treatment of choice for malignant tumor of the faucial tonsil, another various methods for treatment are listed and its effects are conflicting by many authors.

Table 1. Cancer of the Faucial Tonsil —Symptomatology and Clinical Course—

Case No.	Age & Sex	Chief Complaints	Affected side	Histology	T N M Classif.	Stage	Method of Treatment	Follow up Period	Outcome
1	56M	Sore throat	Right	Squamous cell carcinoma	T_1 N_0	I	Surgery, Radiation Chemotherapy (C)	5 yrs. 10 mons.	Alive
2	51M	Sore throat & lump in throat	Left	〃	T_2 N_1	II	Surg., Rad.	2y.	Ceased
3	59M	Sore throat	R.	〃	T_3 N_1	〃	Surg., Rad. Chem. (BLM)	2y. 7m.	A.
4	45M	〃	L.	〃	T_1 N_2	III	Surg., Rad.	6y.	〃
5	61 F	〃	〃	〃	T_2 N_2	〃	Surg., Rad.	9m.	C
6	63M	Swollowing pain	〃	〃	T_4 N_1	〃	Surg., Rad., Chem. (C)	11m.	〃
7	55M	〃	R.	〃	T_3 N_3	IV	Surg., Rad., Chem. (BLM)	3y. 2m.	A.
8	67M	Sore throat	L.	〃	T_3 N_3 M	〃	Chem. (BLM)	5m.	C.

Abbreviation: Chem. (C) means chemotherapy with Cyclophosphamide.
Chem. (BLM) : Chemotherapy with Bleomycin.

In this paper, 28 patients with malignant tumor involvement of the faucial tonsil were listed to present the clinical evaluation. They were all treated at the Department of Otolaryngology Yamaguchi University School of Medicine in a 10-year period ending in 1974 (Table 1, 2 & 3).

Table 2. Malignant Lymphoma of the Faucial Tonsil —Symptomatology and Clinical Course— (1)

Case No.	Age & Sex	Chief Complaints	Affected side	Histology	T N M Classif.	Stage	Method of treatment	Follow up Period	Outcome
1	19M	Sore throat	Left	Reticulum cell sarcoma	$T_0N_1M_0$	I	Surg. (1), Rad.	10yrs. 3 mons.	Alive
2	54 F	Lump in throat	Right	〃	〃	〃	〃	2y. 3m.	Ceased
8	65 F	Sore throat	L.	〃	〃	〃	〃	7y. 5m.	A.
4	69 F	〃	R.	〃	〃	〃	Rad.	2y. 6m.	〃
5	32M	Swollowing pain	〃	〃	$T_0N_2M_0$	II	Surg. (1), Rad., Chem. (BLM)	3m.	C.
6	33M	Lump in throat & neck	L.	〃	〃	〃	Surg. (1), Rad., Chem. (C)	3y. 6m.	A.
7	33M	Sore throat	〃	〃	〃	〃	Surg. (2), Rad., Chem. (BLM)	1y. 8m.	〃
3	38M	〃	〃	〃	〃	〃	Surg. (1), Rad., Chem. (C)	3y. 6m.	〃
9	41M	Swollowing pain	R.	〃	〃	〃	Chem. (MOPP)	10m.	〃
10	46M	Lump in throat	L.	〃	〃	〃	Surg. (3), Rad. Chem. (BLM)	1y. 4m.	〃

Abbreviation
Surg. (1): Resection of tonsil tumor with radical neck dissection.
Surg. (2): Simple resection of tonsil tumor and neck tumor.
Surg. (3): Simple resection of tonsil tumor.
Chem. (C) means chemotherapy with Cyclophosphamide.
Chem. (BLM): Chemotherapy with Bleomycin.
Chem. (MOPP): Chemotherapy with Nitrogen mustard, Vincristine, Procarbazine and Predonisolone.

AGE & SEX DISTRIBUTION (Table 4)

This entity is primarily a disease of elderly males. The age of patients evaluated in this paper ranged from 5 to 82 years old. The disease was most commonly encountered during the sixth decade (29 per cent) followed fifth decade (25 per cent) and fourth decade (21 per cent). The age distribution of cancer tends to concentrate in fourth, fifth and sixth decade, but that of malignant lymphoma is widely ranged from 5 to 82 years old.

There were 21 males (75 per cent) and 7 females (25 per cent). The sex ratio between male and females in cancer was 7 to 1 and that of malignant lymphoma was 14 to 6.

Table 3. Malignant Lymphoma of the Faucial Tonsil —Symptomatology and Clinical course— (2)

Case No.	Age & Sex	Chief Complaints	Affected side	Histology	T N M Classif.	Stage	Method of Treatment	Follow up Period	Outcome
11	49M	Sore throat	Left	Reticulum cell sarcoma	$T_0N_2M_0$	II	Surg. (1), Rad.	8yrs. 8mon.	Alive
12	58M	Sore throat & swollowing pain	〃	〃	〃	〃	〃	8y. 6m.	〃
13	59M	Sore throat	〃	〃	〃	〃	Surg. (1), Rad., Chem. (C)	6y. 4m.	〃
14	64M	〃	〃	〃	〃	〃	〃	3m.	Unknown
15	69M	〃	〃	〃	〃	〃	Surg. (2), Rad., Chem. (BLM)	1y. 4m.	A.
16	82M	〃	Right	〃	〃	〃	Rad.	2m.	Ceased
17	45 F	〃	L.	Lymphosarcoma	$T_0N_1M_0$	I	Surg. (3), Rad.	3m.	〃
18	5 F	Cervical adenopathy on both sides	Both	〃	$T_0N_2M_2$	IV	Chem. (COP)	7m.	〃
19	45M	Sore throat & general adenopathy	〃	〃	$T_0N_3M_2$	〃	Chem. (VEMP)	2m.	〃
20	61 F	Sore throat	R.	Hodgkin's disease	$T_0N_3M_0$	III	Rad., Chem. (MOPP)	1y. 1m.	A.

Abbreviation

Surg. (1): Resection of tonsil tumor with radicak neck dissection.
Surg. (2): Simple resection of tonsil tumor and neck tumor.
Surg. (3): Simple resection of tonsil tumor.
Chem. (C): means chemotherapy with Cyclophosphamide.
Chem. (BLM): Chemotherapy with Bleomycin.
Chem. (MOPP): Chemotherapy with Nitrogen mustard, Vincristine, Procarbazine and Predonisolone.
Chem. (VEMP): Chemotherapy with Vincristine, Cyclophosphamide, 6MP and Predonisolone.
Chem. (COP): Chemotherapy with Cyclophosphamide, Vincristine and Predonisolone.

Table 4. Age and Sex Distribution of Malignant Tumor of the Faucial Tonsil

Age \ Tumor / Sex	Carcinoma		Malignant Lymphoma		Total
	Male	Female	Male	Female	
0 - 9				1	1
10 - 19			1		1
20 - 29					0
30 - 39			4		4
40 - 49	1		4	1	6
50 - 59	4		2	1	7
60 - 69	2	1	2	3	8
70 - 79					0
80 -			1		1
Total	7	1	14	6	28

PATHOLOGIC DISTRIBUTION (Table 5)

The ratio of cancer to malignant lymphoma equals 2 to 5. Cancer occuring on the faucial tonsil was squamous cell carcinoma in all 8 cases. This is 29 per cent of all kind of malignant tumor of the faucial tonsil. Among the malignant lymphomas, reticulum cell sarcoma showed the highest incidence, 16 cases (57 per cent) and followed lymphosarcoma, 3 cases (11 per cent) and Hodgkin's disease 1 case (3 per cent).

Table 5. Pathological Classification of Malignant Tumor of the Faucial Tonsil

Histology	Male	Female	Total
Squamous cell carcinoma	7	1	8
Reticulum cell sarcoma	13	3	16
Lymphosarcoma	1	2	3
Hodgikin's disease	0	1	1
Total	21	7	28

THE PATTERN OF SYMPTOMATOLOGY

The most common complaint which brought the patients to the doctor was sore throat. Twenty-one patients, 75 per cent, noticed the sore throat as an initial symptome. Other primary complaints in decreasing order of frequency were swollowing pain, lump in throat, lump in neck and least frequent, general adenopathy that was complained by a patient of lymphosarcoma, Case No. 19.

Objectively, swelling with ulcer formation of the faucial tonsil was the main figure of cancer. In malignant lymphomas, enlarged faucial tonsil without other clinical manifestation was the characteristic finding. Furthermore, as an unique finding, 2 cases of lymphosarcoma (No. 18 & 19) showed the remarked enlargement of tonsils with dark reddened colour.

THE STAGE CLASSIFICATION OF TONSIL CANCER (Table 6)

In this series, the clinical assessment by extent of tonsil cancer was done by classification in accordance with the system proposed by International Union Against Cancer (I.U.A.C.) which is generally referred to as the T.N.M. system (Table 10). The pattern based on T.N.M. classification showed that each case in our series was classified to different type. In stage classification, one was classified as stage I, two as stage II, three as stage III and two as stage IV. The patient who had distant metastasis was only one case (No. 8).

Table 6. Staging and T.N.M. Classification of Cancer of the Faucial Tonsil

Stage	T.N.M. Classification	No. of Cases	Total
I	T_1 N_0	1	1
II	T_2 N_1	1	2
	T_3 N_1	1	
III	T_1 N_2	1	3
	T_2 N_2	1	
	T_4 N_1	1	
IV	T_3 N_3	1	2
	T_3 N_3 M	1	
Total			8

THE STAGE CLASSIFICATION OF MALIGNANT LYMPHOMA OF THE TONSIL (Table 7)

Clinical staging of malignant lymphoma was accomplished according to the classification suggested by symposium at Ann Arbor in 1971[1),2)]. The extent of disease was described in Table 11. Five cases of the 20 patients studied were diagnosed as stage I ($T_0N_1M_0$), 12 as stege II ($T_0N_2M_0$), 1 as stage III ($T_0N_3M_0$) and 2 as stage IV ($T_0N_2M_2$ and $T_0N_3M_2$).

Table 7. Staging and T.N.M. Classification of Malignant Lymphoma of the Faucial Tonsil

Stage	T.N.M. Classification	No. of Cases	Total
I	$T_0 N_1 M_0$	5	5
II	$T_0 N_2 M_0$	12	12
III	$T_0 N_3 M_0$	1	1
IV	$T_0 N_2 M_2$ $T_0 N_3 M_2$	1 1	2
Total			20

TREATMENTS OF TONSIL CANCER AND THEIR FOLLOW-UP RESULTS

Methods of treatment for tonsil cancer in this series were listed in Table 8, and the survival rate was shown in Table 9.

As a rule, surgical treatment combined with postoperative radiation therapy was adtopted for cancer of tonsil in our clinic. Operation method consisted of an excision of the primary tumor with wide healthy surrounding tissue in continuity with a radical neck dissection.

In 8 cases, 7 had surgical treatment combined with postoperative radiation, and further, 4 of them had additional chemotherapy using cyclophosphamide or Bleomycin. Only one case (No. 8) who had distant metastasis was treated by chemotherapy of Bleomycin intra-venous injection only. In the Stage I case (No. 1), the patient is alive over 5 years. In the stage II cases, two years arrest rate was 100 per cent and one of them is alive now. In the stage III cases, 2 cases ceased within one year after the start of the treatment and one is alive over 5 years. In the stage IV cases, one ceased within one year and the others had 3 years arrest and alive now.

Table 8. Method of Treatment of the Malignant Tumor of the Faucial Tonsil

	Surgery	Radiation	Chemotherapy	S. & R.	S. & C.	R. & C.	S., R. & C.
Cancer	0	0	1	3	0	0	4
Malignant lymphoma	0	2	3	6	0	1	8

Table 9. Survival Rate of Malignant Tumor of the Faucial Tonsil According to Staging Classification

Stage	Tumor	within 1 year	1 yr.	2 yrs.	3 yrs.	4 yrs.	over 5 yrs.	unknown
I	Cancer						1(1)/1	
	Mal. lymphoma	1/5		2(1)/5			2(2)/5	
II	Cancer			2(1)/2				
	Mal. lymphoma	3(1)/11	3(3)/11		2(2)/11		3(3)/11	1
III	Cancer	2/3					1(1)/3	
	Mal. lymphoma		1(1)/1					
IV	Cancer	1/2			1(1)/2			
	Mal. lymphoma	2/2						

The number in ( ) shows the alive cases.

TREATMENT OF MALIGNANT LYMPHOMA OF THE TONSIL AND THEIR FOLLOW-UP RFSULTS

Reviewing the literature[3),4),5)] concerning the problem of treatment of malignant lymphoma of the tonsil, through the world, radiation therapy became up-to-date treatment of choice in its early stage. On the other hand, in selected patients with unicentric disease, extirpation is recommended as the first choice of treatment when the disease is found as a primary focus in any single organ ie faucial tonsil for example[6)].

Though, recently, radiation therapy has been accepted as a principal method of treatment in our clinic also, the method of treatment in this series is not uniform and various method of treatment were performed (Table 8).

The survival rate was shown in Table 9. Eight had the combination therapy of surgery, radiation therapy and chemotherapy. One had radiation with chemotherapy. Three cases had chemotherapy and 2 had radiation

therapy. Fourteen cases who had surgical treatment all belong to stage I or stage II. Only one case of stage III had radiation with chemotherapy. Two cases of Stage IV had single chemotherapy those who had lymphosarcoma.

In the stage I cases, 3 are alive now. Two of them showed 5 year arrest and one showed 2 year arrest. Two cases ceased within 2 years. Among 12 cases of stage II, two of them ceased within one year, one case is unknown and the remainders are all alive now, and 3 cases are alive over 5 years. Only one case of stage III is alive now with one year follow-up. In the stage IV cases, two cases ceased within one year.

DISCUSSION

The necessity for staging in the clinical study of malignant tumor has had widespread recognized throughout the medical world, and its importance is indicated by the number of national and international committees that are working toward forming acceptable criteria for staging. Behind this movement is the basic conviction that reports of cure rate for any form of therapy are not meaningful unless the stage of lesion has been considered. The fruit of such efforts is a more sound clinical judgement with respect to treatment and prognosis[7].

Furthermore, Carbone et al[1] emphasized that the classification for staging has two aims as follows; The first is to facilitate communication and to exchange information. The second aim is to provide guidance of prognosis and to assist in the therapeutic decisions.

Twenty-eight cases of malignant tumor of the faucial tonsil in this series are equivalent to 9 per cent of malignant tumor that were treated at our clinic during the same period.

In this series, assessment by extent of cancer of tonsil at the time of treatment was done using the system proposed by the International Union Against Cancer.

Many reports[8),9),10] of classification for malignant lymphoma are found, hitherto, and in this series, we adopted the classification accomplished by the Symposium at Ann Arbor, 1971.

For the primary form of the treatment in the tonsil cancer, Allen and Hemenway[11] adviced surgery in all cases of cancer with involvement of the cervical nodes. Terz and Farr[12] recommended surgery with the results as follows; For the group treated by irradiation, the 5 year survival rate was 19.5 per cent and for those subjected to surgical treatment, it was 26.5 per cent. The primary tumor and the cervical lymphnode metastasis had a lower

recurrence after surgical treatment than after irradiation. In addition, surgical intervention resulted in a somewhat slightly higher 10 year relative survival rate.

On the other hand, Schulz[13] and Daly et al[7] recommended radiotherapy as the primary method for tonsil cancer.

Baker et al[14], in their experience, stated that radiation of the primary tumor followed by a radical neck dissection appears to offer the best chance of cure. Ward et al[15] stated that the results of irradiation therapy alone for stage II, III and IV indicate the need for more effective method of therapy.

In this series, 7 cases treated by surgery had all postoperative irradiation. Only one case of stage IV who had distant metastasis was treated with chemotherapy alone.

Four cases are alive now and 2 of them showed 5 year arrest. Four cases ceased within 2 years. Five year survival rate is over 33 per cent.

It is widely accepted that radiation therapy is the principal and most effective form of treatment in the majority of patients with malignant lymphoma[3),4),5] and the value of irradiation is sustained by the low incidence of local recurrence following this form of treatment[12].

Megavoltage radiotherapy to dosage of about 3500 to 4000 rads in approximately 4 weeks over wide field covering the involved lymphnode chains in continuity is treatment of choice for regionally localized disease and offers a substantial chance of permanent cure[16),17),18].

The dosage of radiation therapy in all patients of this series is over 3000 rads by X-ray.

On the other hand, an initial surgical approach followed by a tumor dose of radiation is preferred method of treatment in a few selected patients suggested by Molander and Pack[6]. It is shown in Table 12.

Chemotherapy is the main way of treatment for advanced type (stage III and IV), and results of some combination therapy has been reported [19),20)]. Drugs used as combination are Vinca alkaloids, alkylating agents, antimetabolites, antibiotics, steroid hormone and Procarbazine, etc.

In this series, the method of treatment is not uniform. Various methods of treatment for malignant lymphoma were shown as Table 8. In 19 cases of malignant lymphoma (except for 1 case of unknown), 13 cases are alive and 6 were dead. Among the 13 patients of alive cases, 5 have over 5 year arrest.

They all belong to stage I or stage II and all of them had surgical treatment combined with radiation therapy. Five year survival rate might be at least 45 per cent, which is not so poorer in comparison with the data of survival rate reported in the literature. This results indicates that the surgical approach is preferable treatment in the early stage cases.

Further, combined chemotherapy was done only in 3 patients (No. 9, 18 and 19). Of them two patients ceased. The ceased cases were both advanced lymohosarcoma. Another case of lymphosarcoma (No. 17) ceased within one year in spite of the early stage, and the author have impression that the prognosis of lymphosarcoma seems to be worse than the other type of sarcomas.

Table 10. T.N.M. Classification of Cancer of the Faucial Tonsil (I.U.A.C.)

T_1	Confined to the tonsillar bed and less than 3 cm diameter.
T_2	Minimal extension to adjacent structures: approximately 3 to 5 cm diameter.
T_3	Large or extensive lesion with moderate infiltration into surrounding structure: larger than 5 cm.
T_4	Massive lesion.
N_0	No node.
N_1	Single small to moderate size (less than 3cm) or two adjacent small nodes (less than 2 cm each)
N_2	Large, movable node (more than 3 cm) or multiple unilateral nodes (more than 2 cm)
N_3	Fixed large unilateral node or nodes, or bilateral nodes.
M.	Distant metastasis.

Stages of Cancer of the Faucial Tonsil

Stage I	T_1 N_0, T_2 N_0
Stage II	T_1 N_1, T_2 N_1, T_3 N_0, T_3 N_1
Stage III	T_1 N_2, T_2 N_2, T_3 N_2, T_4 N_0, T_4 N_1
Stage IV	T_4 N_2 and all combinations of T with N_3; also M (distant metastasis).

(J. F. DALY & M. FRIEDMAN 1960)

Table 11. The Clinical Staging Classification of Malignant Lymphoma accomplished by Symposium at Ann Arbor 1971

For Primary Lymph Node Disease

T_0 N_0 M_0: Single lymph node region.

T_0 N_2 M_0: More than one region above or below the diaphragm.

T_0 N_3 M_0: Lymph node regions above and below the diaphragm.

For Primary Extranodal Disease

T_1 N_0 M_0: Single extranodal site only.

T_1 N_1 M_0: Single extranodal site + adjacent or regional lymph node involvement.

T_1 N_2 M_0: Single extranodal site + more than one lymph node region above or below diaphragm.

T_1 N_3 M_0: Single extranodal site + lymph node region above and below diaphragm.

M_1: Involvement of two vital tissues.

M_2: Involvement of more than three vital tissues such as liver, lung, bone marrow, etc.

Ⅰ	Single Lymph Node Region	T_0 N_1 M_0
	or Single Extranodal Site	T_1 N_0 M_0
		T_0 N_2 M_0
Ⅱ	Two or more L. N. regions - Upper torso	
	Lower torso	
	or Extranodal site and regional nodes	T_1 N_1 M_0
Ⅲ	Lymph node regions upper and lower torso	T_0 N_3 M_0
	or Extra nodal site and L. N.'s beyond regional	T_1 N_{2-3} Mo
Ⅳ	Involvement of vital organs or systems or multiple extranodal sites	T_{0-1} N_{0-3} M_{1-2}

(Yamashita et al, 1973)

Table 12. Modalities of Treatment in Maligant Lymphoma

A. Radiation Therapy
1. Definitive in Stage Ⅰ.
2. Possibly definitive in Stage Ⅱ.
3. Palliative in Stage Ⅲ.

B. Surgery
1. Definitive in selected patients with unicentric disease.
2. Palliative, for example, to remove bulky tumor masses or relieve intestinal obstruction.

C. Chemotherapy (adjuvant)
1. Alkylating agents.
2. Antimetabolites.
3. Hormones.

D. Combinations of the above.

(David W. Molander and George T. Pack 1965)

SUMMARY AND CONCLUSION

Twenty-eight cases of malignant tumors in the faucial tonsil who were treated at the Department of Otolaryngology Yamaguchi University School of Medicine during 1965 to 1974 were analysed.

Results are as follows:

1. Histo-pathologically, the incidence of malignant tumor in the faucial tonsil is reticulum cell sarcoma in 16 (57 per cent), squamous cell carcinoma in 8 (29 per cent), lymphosarcoma in 3 (11 per cent) and Hodgkin's disease in 1 (3 per cent). The ratio of cancer to malignant lymphoma equals 2 to 5.

2. This disease is most commonly encountered during sixth decade of age. The youngest case is 5 years old and the oldest one is 82 years old. The sex ratio of male to female equals 3 to 1.

3. Sore throat is the most common complaint.

4. The stage classification of cancer is accomplished using the system of I.U.A.C. and that of malignant lymphoma is done by the decision of Symposium at Ann Arbor.

5. In 28 cases, 17 are alive, 10 ceased and one is unknown. Among the 17 alive cases, 7 has 5 year arrest (cancer: 2, malignant lymphoma: 5). The number of cases studied in this series is too small to do statistical calculation for significance in relationship between the stage classification and its prognosis.

6. Though radiation therapy is widely accepted as the treatment of choice for malignant tumor of the faucial tonsil, especially in early stage cases, surgical treatment is also effective in both cancer and malignant lymphoma in our series.

7. Effective combined chemotherapy plays an important role for the treatment of advanced cases of malignant tumor of the faucial tonsil.

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REFERENCES

1) Carbone, P. P., Kaplan, H. S., Musshoff, K., Smithers, D. W. and Tubiana, M.: Report of Committee on Hodgkin's Disease Staging Classification. *Cancer Res*., 31 : 1860-1861, 1971.
2) Yamashita, H., Okura, J., Yoshioka, T. and Watanabe, T.: Clinical staging classification of malignant lymphoma and its evaluation (Japanese). *Japanese J. Clini. Rad.*, 18 : 877-889, 1973.
3) Rosenberg, S. A., Diamond, H. D. and Craver, L. F.: Lymphosarcoma-Survival and the effects of therapy. *Amer. J. Roent.*, 85 : 521-532, 1961.

4) McNelis, F. L. and Pai, V. T.: Malignant lymphoma of head and neck. *Laryngoscope*, 79 : 1076-1089, 1969.
5) Banfi, A., Bonadonna, G., Carnevali, G., Morinari, R. and Monfardini. S.: Lymphoreticular sarcoma with primary involvement of Waldeyer's ring Clinical evaluation of 225 cases. *Cancer*, 26 : 341-351, 1970.
6) Molander, D. W. and Pack, G. T.: Management and survival of 883 patient with malignant lymphoma. *Amer. J. Roent.*, 93 : 154-159, 1965.
7) Daly, J. F. and Friedman, M.: Carcinoma of Tonsil. *Laryngoscope*, 70 : 595-614, 1960.
8) Peters, M. V.: A study of survivals in Hodgkin's disease treated radiologically. *Amer. J. Roent.*, 63 : 299-311, 1950.
9) Kaplan, H. S.: The radical radiotherapy of regionally localized Hodgkin's disease. *Radiol.*, 78 : 533-569, 1962.
10) Tubiana, M.: Summary of informal discussion on staging procedures in Hodgkin's disease. *Cancer Res.*, 31 : 1251-1254, 1971.
11) Allen, G. W. and Hemenway, W. G.:Carcinoma of tonsil -Surgical treatment-. *Laryngoscope*, 70 : 246-257, 1960.
12) Terz, J. J. and Farr, H. W.: Primary lymphosarcoma of the tonsil. *Surgery*, 65 : 772-776, 1969.
13) Schulz, M. D.:Tonsil and palatine arch cancer -Treatment by radiotherapy-. *Laryngoscope*, 75 : 958-967, 1965.
14) Baker, R. R. and Weiner, S.: The clinical management of tonsillar carcinoma. *Surg. Gynecol. Obstet.*, 121 : 1035-1038, 1965.
15) Ward, N. O., Gore, W. A. and Acquarelli, M. J.: Carcinoma of the tonsil. *Amer. J. Surg.*, 116 : 487-490, 1968.
16) Kaplan, H. S.: Role of intensive radiotherapy in the management of Hodgkin's disease. *Cancer*, 19 : 356-367, 1966.
17) Tikka, U. and Malmio, K.: Clinical and radiotherapeutic aspects of reticulum cell sarcoma. *Acta Radiol. Ther.*, 8 : 459-470, 1969.
18) Kitabatake, T., Inakoshi, H., Sato, M., Yokoyama, M., Hara, M. and Kurokawa, H.: Radiation therapy of malignant lymphoma (Japanese). *Japanese. J. Clinical Radiol.*, 17 : 859-868, 1972.
19) Devita, V. T., Serpick, A. A. and Carbone, P. P.: Combination chemotherapy in the treatment of advanced Hodgkin's disease. *Ann. Int. Med.*, 73 : 881-895, 1970.
20) Kimura, K., Sakai, Y., Konda, C., Shimayama, M., Kitahara, T., Sakano, T., Mikuni, M., Nomura, K. and Yoshimura, H.: Chemotherapy of malignant lymphoma (Japanese). *Clinical All-round*, 20 : 1556-1562, 1971.