

## Clinical and Statistical Studies on Laryngeal Carcinoma in Kawasaki Medical School Hospital

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**ABSTRACT.** The authors reported clinical and statistical studies on the forty-two cases with laryngeal carcinoma that were admitted to Kawasaki Medical School Hospital between June 1975 and September 1981, that is, these cases were reported from viewpoints of age, rate of existence, chief complaints, smoking, drinking, treatments, prognoses, double carcinoma, cause of death, primary parts, total laryngectomy etc.

**Key words :** Laryngeal carcinoma — Laryngectomy — Smoking — Squamous cell carcinoma

The patients with laryngeal carcinoma have been relatively frequently found out and treated in our department of Kawasaki Medical School Hospital.

However, the results of the treatment are not satisfying yet and then we tried clinical and statistical studies on these cases, in order to improve the results of the treatment on the patients with laryngeal carcinoma.

### MATERIALS AND METHODS

We did clinical and statistical studies on the forty-two cases with laryngeal carcinoma that were admitted to Kawasaki Medical School Hospital and their initial treatment were begun in our department between June 1975 and September 1981.

They were all male and all of them were diagnosed to be squamous cell carcinoma pathologically.

### RESULTS

We would like to state the results according to the figures and the tables that illustrate from the various viewpoints.

1. These forty-two cases with laryngeal carcinoma were from 39-year-old to 84-year-old with an average age of 65.0 years. As ten cases out of forty-two died and two cases were missing, rate of existence was 71.4%. If these two cases were in existence, the rate would be 76.2% (Fig. 1).

2. The classification according to chief complaint was performed, and hoarseness was found in 34 cases of the largest majority. A sense of incongruity

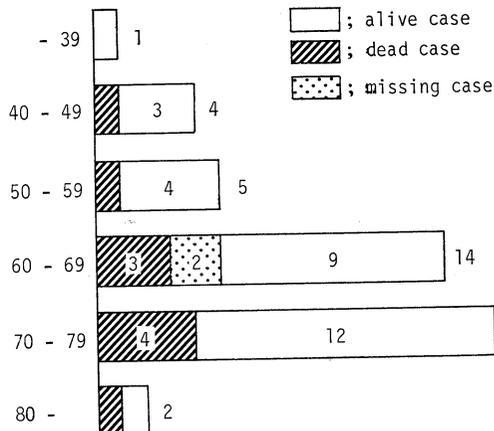


Fig. 1. Age Distribution in the 42 cases with Laryngeal Carcinoma

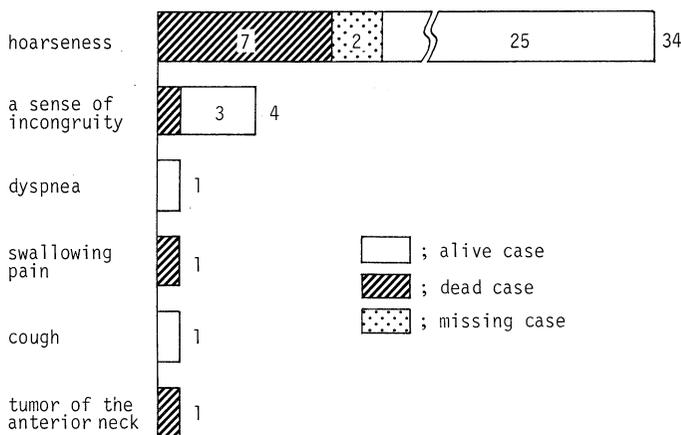


Fig. 2. The Classification according to the chief complaint

was found in 4 cases. Dyspnea, swallowing pain, cough and tumor of the anterior neck were found in each one. Number of the dead cases were 7/34 (2 missing) with hoarseness, 1/4 with a sense of incongruity, and each one with swallowing pain and tumor of the anterior neck (Fig. 2).

3. Distribution of smoking history was traced as compared with Brinkman's index 500 (the product of number of cigarettes per day and number of years in smoking).

The absolute majority of the smokers were over his index, while four smokers and three non-smokers only were under his index (Fig. 3). Incidentally, though a drinking habit in these cases was checked up, we could not find out the positive correlation between the drinking and laryngeal carcinoma.

4. The treatments and prognoses were traced according to the classification of the stage I~IV. In stage I, operation was performed in 4/11 cases. Radiotherapy, chemotherapy and immunotherapy were performed in each 10/11, 8/11 and 9/11 cases. Total dosage of the radiotherapy was between 3960 and

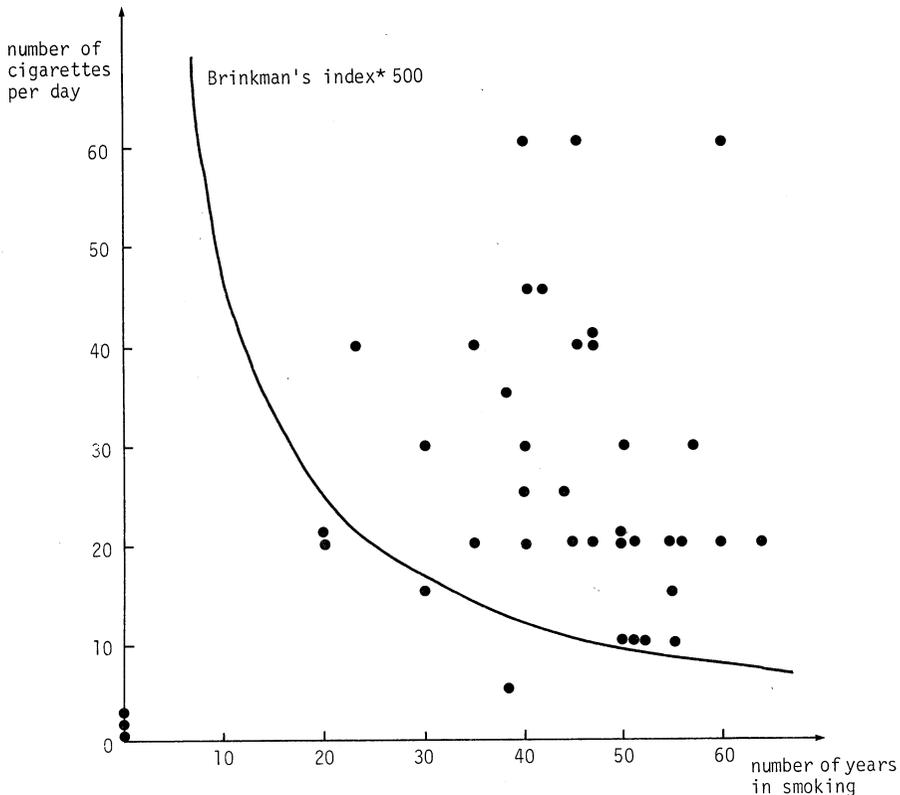


Fig. 3. The distribution of the smoking history

\* Brinkman's index is the product of number of cigarettes per day and number of years in smoking.

7020 rads (6028 rads on the average in the ten cases).

Though one case only died of cerebral apoplexy in 23 months and another case was missing after eight months, 9/11 (81.8%) cases were in good course from 3 to 78 months (Table 1).

In stage II, operation was performed in 6/8 cases. Radiotherapy, chemotherapy and immunotherapy were performed in 7/8 cases. Total dosage of the radiotherapy was between 2200 and 7200 rads (4574 rads on the average in the seven cases). Though one case only died of the primary carcinoma in 14 months, 7/8 (87.5%) cases were in good course from 3 to 41 months (Table 2).

In stage III, operation, radiotherapy, chemotherapy and immunotherapy were performed in each 3/6, 6/6, 4/6 and 6/6 cases. Total dosage of the radiotherapy was between 4000 and 7200 rads (5880 rads on the average in six cases). One case died of esophageal carcinoma and two cases had each local recurrence or neck metastases. Accordingly, 3/6 (50.0%) cases only were in good course from 5 to 46 months (Table 3).

In stage IV, operation, radiotherapy, chemotherapy and immunotherapy were performed in each 6/17, 16/17, 15/17 and 13/17 cases. Total dosage of the radiotherapy was between 3000 and 8100 rads (5683 rads on the average in the

TABLE 1 The treatments and prognoses in the stage I-cases

Case No.	Age	Op.	Rad.	Chemo.	Imm.	Prog. (m)
2	(42)	+	3960	—	—	78 (m) A
7	(67)	—	6000	—	P·O	23 D <sup>1)</sup>
10	(70)	—	6000	—	—	46 A
13	(66)	—	7020	F	P·O	8 M
17	(47)	+	6500	F	P·O	39 A <sup>2)</sup>
25	(71)	—	6600	F	P·O	20 A
26	(75)	—	7020	F	P·O	19 A
35	(55)	+	4180	F	P·O	11 A
37	(77)	—	6400	F	P·O	5 A
41	(39)	—	6600	F	P·O	3 A
42	(54)	+	—	F	P·O	3 A

1) died of cerebral apoplexy

2) laryngectomy for local recurrence after irradiation

(Op ; Operation, Rad. ; Radiotherapy, Chemo. ; Chemotherapy,  
Imm. ; Immunotherapy, F ; FT207, P ; PSK, O ; OK432, m ; months,  
A ; alive case, D ; dead case, M ; missing case)

TABLE 2 The treatments and prognoses in the stage II-cases

Case No.	Age	Op.	Rad.	Chemo.	Imm.	Prog. (m)
4	(44)	+	3000	BM	—	14 (m) D
14	(70)	—	7020	F	P·O	41 A
15	(61)	+	2200	F	P·O	41 A
20	(73)	+	3600	F	P·O	30 A
27	(66)	—	7200	F	P·O	17 A
28	(58)	+	3000	—	P	17 A <sup>1)</sup>
33	(60)	+	6000	BM·F	P·O	13 A
40	(49)	+	—	F	P·O	3 A

1) Penicillin allergy case

(m ; months, A ; alive case, D ; dead case, BM ; BLM and MMC,  
F ; FT207, P ; PSK)

TABLE 3 The treatments and prognoses in the stage III-cases

Case No.	Age	Op.	Rad.	Chemo.	Imm.	Prog. (m)
6	(72)	—	6600	—	P	16 (m) D <sup>1)</sup>
11	(64)	—	7200	—	P·O	46 A
32	(76)	—	6480	F	P·O	14 A
34	(60)	+	4000	F	P·O	10 A <sup>2)</sup>
36	(70)	+	6000	F	P·O	9 A <sup>3)</sup>
38	(67)	+	5000	F	P·O	5 A

1) died of esophageal cancer

2) local recurrence (+)

3) cervical metastases (+)

(F ; FT207, P ; PSK, O ; OK432, m ; months, A ; alive case,  
D ; dead case)

sixteen cases). Six cases died of the primary carcinoma in each 43, 13, 27, 24, 9 and 12 months. One case died of esophageal carcinoma in 17 months. Another case with stomach carcinoma was missing after 9 months. Two cases had neck metastases in each 79 and 15 months and another case had lung metastases in 27 months, while another case had stomach carcinoma in 17 months.

Therefore 5/17 (29.4%) cases only were in good course from 3 to 64 months (Table 4, Fig. 4).

TABLE 4 The Treatments and Prognoses in the Stage IV-Cases

Case No.	Age	Op.	Rad.	Chemo.	Imm.	Prog. (m)
1	(63)	+	3800	—	—	79 (m) A <sup>1)</sup>
3	(71)	—	8100	BM	—	43 D
5	(71)	+	3000	—	—	64 A
8	(53)	—	7000	BM	—	13 D
9	(70)	—	6000	F	P·O	27 D <sup>2)</sup>
12	(70)	—	7040	F	P	24 D
16	(72)	—	5200	F	P·O	40 A
18	(69)	+	3500	F	P·O	17 D <sup>3)</sup>
19	(66)	—	6600	F	P·O	9 D
21	(84)	—	6120	BM·F	P·O	12 D
22	(77)	—	7020	F	P·O	22 A
23	(63)	+	—	BM·F	P·O	21 A
24	(58)	+	5400	F	P·O	27 A <sup>4)</sup>
29	(64)	+	3000	F	P·O	9 M <sup>5)</sup>
30	(83)	—	6000	F	P·O	17 A <sup>3)</sup>
31	(76)	—	6140	BM·F	P·O	15 A <sup>1)</sup>
39	(65)	—	7000	Pe·F	P·O	3 A

- 1) cervical metastases (+),
- 2) pulmonary tuberculosis (+),
- 3) died of esophageal carcinoma,
- 4) pulmonary metastases (+),
- 5) gastric cancer (+)

(BM ; BLM and MMC, F ; FT207, Pe ; PEP, P ; PSK,  
 O ; OK432, m ; months, A ; alive case, D ; dead case,  
 M ; missing case)

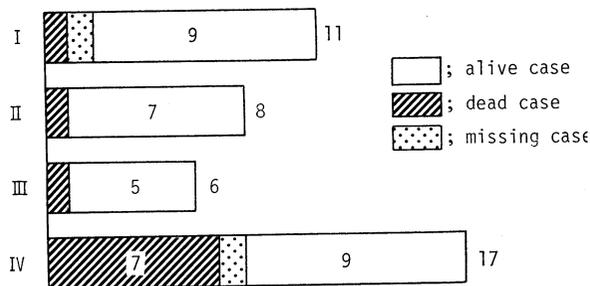


Fig. 4. Stage Distribution in the 42 cases with Laryngeal Carcinoma

5. Four cases of double carcinoma were found out in these forty-two cases, that is, two cases were simultaneous with stomach carcinoma (adenocarcinoma) and the other two were with esophageal carcinoma (squamous cell carcinoma) not simultaneously.

Particularly one case was suspected of sixfold carcinoma in larynx, esophagus,

TABLE 5 The prognoses in the 4 cases with double carcinoma

Case No.	Age	Stage	Site	Path.	Prog. (m)
6	(72)	III	esophagus	SCC	16 (m) D
18	(69)	IV	esophagus	SCC	17 D <sup>1)</sup>
29	(64)	IV	stomach	Adeno.	9 A
30	(83)	IV	stomach	Adeno.	17 A

1) suspected of sixfold carcinoma  
 (SCC ; squamous cell carcinoma, Adeno. ; adenocarcinoma,)  
 m ; months, A ; alive case, D ; dead case

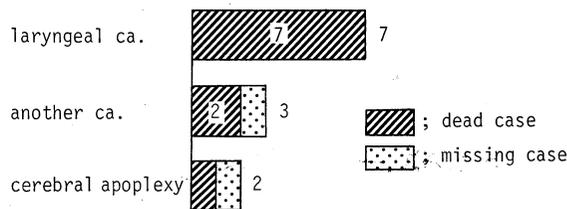


Fig. 5. The classification according to the cause of death

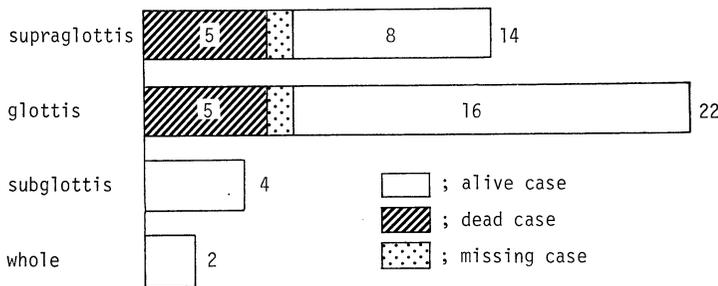


Fig. 6. The classification according to the Position

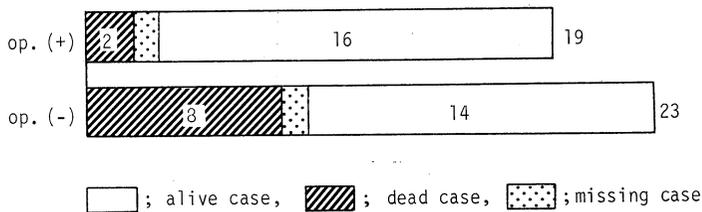


Fig. 7. Total laryngectomy

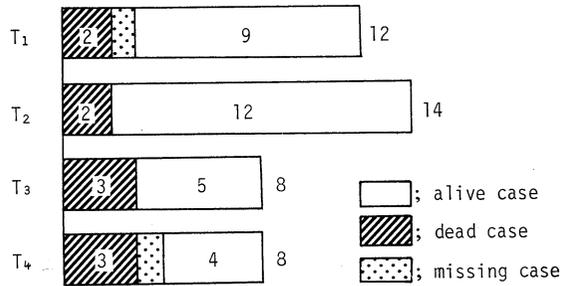


Fig. 8. The Distribution of the T-classification

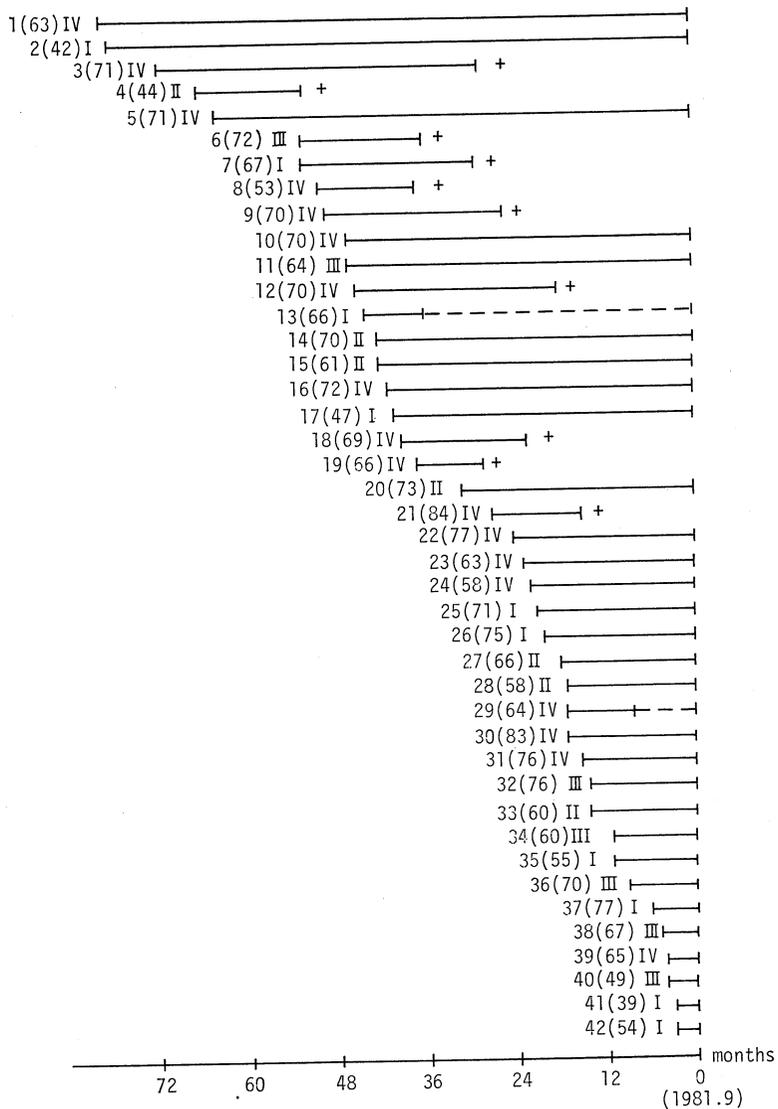


Fig. 9. The survival of the 42 cases

lung, bladder, rectum and colon.

One case of double carcinoma with esophageal carcinoma, and another case suspected of sixfold carcinoma died of esophageal carcinoma in each 17 and 16 months (Table 5).

6. Ten cases of the dead were classified by the diseases that died of.

Seven cases died of laryngeal carcinoma (primary disease). Two cases and another died of each esophageal carcinoma and cerebral apoplexy. Furthermore two cases were missing with each stomach carcinoma and cerebral apoplexy (Fig. 5).

7. Forty-two cases with laryngeal carcinoma were classified by the position that was found out at the outset.

Supraglottic type was found in 14 cases that 5 cases died and one was missing. Glottic type was found out in 22 cases that 5 cases died and one was missing. Though subglottic type was found in 4 cases and whole type was found in 2 cases, nobody died in these cases (Fig. 6).

8. Total laryngectomy was performed in 19 cases that two cases died and one was missing. This operation was not performed in 23 cases that 8 cases died and one was missing (Fig. 7).

9. The dead cases were classified according to T-classification. These ratios were 2/12, 2/14, 3/8 and 3/8 cases in each T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub>.

One case in T<sub>1</sub> and another in T<sub>4</sub> were missing (Fig. 8).

10. The survival of the forty-two cases was arranged chronologically from the first case to the forty-second case (Fig. 9).

Though ten cases died in the first half from the first to the twenty-first, nobody died in the latter half from the twenty-second to the forty-second.

## DISCUSSION

First of all, it is interesting that forty-two cases with laryngeal carcinoma are all male in our department, though it is said generally that male to female is in the ratio of ten to one.

By the way, it is significant and as follows to consider the results from the other various viewpoints.

1. The range of their age was from 39 years to 84 years, with an average age of 65.0 years. The cases above 70 years were found out in 18/42 (42.9%) cases. It is presumed that the percentage of contraction of laryngeal carcinoma has a tendency to increase in number with aging.

2. It is suggestive to anticipate the prognoses by the chief complaint that each one case with swallowing pain and tumor of the anterior neck were included in the dead cases.

3. Brinkman's index 500 was judged to be reliable, as the absolute majority of the cases (39/42 cases) with laryngeal carcinoma were smokers and the absolute majority of them (35/39 cases) were over his index.

On the contrary, drinking was not so related to the laryngeal carcinoma as smoking.

4. Operation in stage I, II, III and IV was performed in each 4/11 (36.4%) cases, 6/8 (75.0%) cases, 3/6 (50%) cases and 6/17 (35.3%) cases.

From these data we can easily understand that operation in stage I is not so necessary as stage II, operation is most suitable to stage II, and operation is found more difficult to be performed with the advance from stage II to stage III and IV.

The other treatments except operation were performed almost the same in general from stage I to stage IV, though total dosage of the radiotherapy was the least on the average in stage II that operation was judged to be most effective.

The ratio of the cases that were in good course was 81.8% in stage I, 87.5% in stage II, 50.0% in stage III and 29.4% in stage IV.

Therefore it is considered to be appropriate for the patients and their families that we explain laryngeal carcinoma in the early stadium will be able to be cured from 80% to 90%, at least 80%

5. Such a double carcinoma as were found in 4/42 cases is considered to increase in number, according as the aged increases and the medical treatment makes progress.

6. The ratio of the dead cases was 10/42 (23.8%) cases in all of the cases from stage I to stage IV, and 7/42 (16.7%) cases died of laryngeal carcinoma that was primary disease.

In other words, the ratio of the dead cases was about one case per four cases, and the ratio died of laryngeal carcinoma only was one case to six cases. These ratios may be considered to be about right, though we are never satisfied with these.

7. Glottic type is considered to have the best prognosis compared with the other types, but the comparison among the other types seems to be difficult to be judged from these forty-two cases only.

8. We have found out the good prognosis in the nineteen cases that total laryngectomy was performed, and then this operation is considered to be still the most useful radical therapy with radical neck dissection to save the patients' lives, even in the modern medicine making remarkable progress.

9. These prognoses classified according to T-classification were much better in T<sub>1</sub> and T<sub>2</sub> than in T<sub>3</sub> and T<sub>4</sub>, and these data were as was expected.

10. Ten cases died in the first half and nobody died in the latter half, in the observation of the survival of the forty-two cases arranged chronologically.

From this actual fact, it may be imagined that the therapy in laryngeal carcinoma is making progress steadily, though the term of the pursuit and the investigation of these cases are not enough in the latter half.

Therefore we can expect fairly the elevation of the results of the treatments in the patients with laryngeal carcinoma by the attentive combination of operation, radiotherapy, chemotherapy and immunotherapy.

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