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Staff Meeting Bulletin
Hospitals of the » » »
University of Minnesota



Carcinoma
of the Tongue

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .
UNIVERSITY OF MINNESOTA

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UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
CALENDAR OF EVENTS

Visitors Welcome

February 9 - February 14, 1948

No. 189

Monday, February 9

- 9:00 - 9:50 Roentgenology-Medicine Conference; L. G. Rigler, C. J. Watson and Staff; Todd Amphitheater, U. H.
- 9:00 - 10:50 Obstetrics and Gynecology Conference; J. L. McKelvey and Staff; Interns' Quarters, U. H.
- 9:15 - Fracture Rounds; A. A. Zierold and Staff; Ward A, Minneapolis General Hospital.
- 10:00 - 12:00 Neurology Ward Rounds; A. B. Baker and Staff; Station 50, U. H.
- 11:00 - 11:50 Physical Medicine Conference; Amputations; Glenn Gullickson; E-101, U. H.
- 11:00 - 11:50 Roentgenology-Medicine Conference; Staff; Veterans' Hospital.
- 11:00 - 12:00 Cancer Clinic; K. Stenstrom and D. State; Eustis Amphitheater, U. H.
- 12:15 - 1:20 Pediatric Seminar; Sequelae of Bulbar Poliomyelitis; Wallace Lueck and John Galligan; 6th Floor Seminar Room, U. H.
- 12:15 - 1:20 Obstetrics and Gynecology Journal Club; M-435, U. H.
- 12:30 - 1:20 Pathology Seminar; Electroencephalogram, David Daly; 104 I. A.
- 12:30 - 1:30 Physiology Seminar; Interaction among iodine goitrogens and thyrotropic hormone; A. Albert, Mayo Clinic; 214 M. H.
- 12:30 - 1:50 Surgery Grand Rounds; A. A. Zierold, Clarence Dennis and Staff; Minneapolis General Hospital.
- 1:30 - 2:30 Pediatric-Neurological Rounds; R. Jensen, A. B. Baker and Staff; U. H.
- 4:00 - 5:00 School of Public Health Seminar; Subject to be announced; 113 MeS.

Tuesday, February 10

- 8:30 - 10:20 Surgery Reading Conference; Lyle Hay; Small Conference Room, Bldg. I, Veterans' Hospital.
- 9:00 - 9:50 Roentgenology Pediatrics Conference; L. G. Rigler, I. McQuarrie and Staff; Eustis Amphitheater, U. H.
- 10:30 - 11:50 Surgical Pathological Conference; Lyle Hay and Nathaniel Lufkin; Veterans' Hospital.

- 12:30 - 1:20 Pathology Conference; Autopsies; Pathology Staff; 102 I. A.
- 2:00 - 2:50 Dermatology and Syphilology Conference; H. E. Michelson and Staff; Bldg. III, Veterans' Hospital.
- 3:15 - 4:20 Gynecology Chart Conference; H. L. McKelvey and Staff; Station 54, U.H.
- 3:30 - 4:20 Clinical Pathological Conference; Staff; Veterans' Hospital.
- 4:00 - 5:30 Surgery-Physiology Conference; O. H. Wangensteen and M. L. Visscher; Eustis Amphitheater, U. H.
- 5:00 - 5:50 Roentgenology Diagnosis Conference; Daniel Fink and Staff of Veterans' Hospitals; M-515, U. H.

Wednesday, February 11

- 8:00 - 8:50 Surgery Journal Club; O. H. Wangensteen and Staff; M-515, U. H.
- 8:30 - 12:00 Neurology Rehabilitation and Case Conference; A. B. Baker and Joe R. Brown; Veterans' Hospital.
- 11:00 - 11:50 Pathology-Medicine-Surgery Conference; Myocardial infarction; E. T. Bell, O. H. Wangensteen, C. J. Watson and Staff; Todd Amphitheater, U. H.
- 4:00 - 5:00 Infectious Disease Rounds; Todd Amphitheater, General Hospital, Veterans' Hospital.

Thursday, February 12 -- Holiday

Friday, February 13

- 8:30 - 10:00 Neurology Grand Rounds; A. B. Baker and Staff; Station 50, U. H.
- 9:00 - 10:30 Pediatric Grand Rounds; I. McQuarrie and Staff; Eustis Amphitheater, U. H.
- 9:00 - 9:50 Medicine Grand Rounds; C. J. Watson and Staff; Todd Amphitheater, U.H.
- 10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
- 10:30 - 11:20 Medicine Grand Rounds; Staff; Veterans' Hospital.
- 10:30 - 11:50 Otolaryngology Case Studies; L. R. Boies and Staff; Out-Patient Department, U. H.
- 11:00 - 12:00 Surgery-Pediatric Conference; C. Dennis, A. V. Stoesser and Staffs; Minneapolis General Hospital.
- 11:30 - 12:50 University of Minnesota Hospitals General Staff Meeting; Medical Education and Research in Japan; Irvine McQuarrie; New Powell Hall Amphitheater.

- 12:00 - 1:00 Surgery Literature Conference; Clarence Dennis and Staff; Minneapolis General Hospital; Small Class Room.
- 1:00 - 1:50 Dermatology and Syphilology; Presentation of Selected Cases of the Week; H. E. Michelson and Staff; W-312, U. H.
- 1:00 - 2:50 Neurosurgery-Roentgenology Conference; W. T. Peyton, Harold O. Peterson and Staff; Todd Amphitheater, U. H.

Saturday, February 14

- 7:45 - 8:50 Orthopedics Conference; Wallace H. Cole and Staff; Station 21, U. H.
- 8:00 - 9:00 Pediatric Psychiatric Rounds; Reynold Jensen; 6th Floor West Wing, U. H.
- 8:00 - 9:30 Psychiatry and Neurology Grand Rounds; Staff; Veterans' Hospital.
- 9:00 - 9:50 Surgery-Roentgenology Conference; O. H. Wangensteen, L. G. Rigler, and Staff; Todd Amphitheater, U. H.
- 9:00 - 9:50 Medicine Case Presentation; C. J. Watson and Staff; M-515, U. H.
- 10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; M-515, U. H.
- 10:00 - 12:50 Obstetrics and Gynecology Grand Rounds; J. L. McKelvey and Staff; Station 44, U. H.
- 11:00 - 12:20 Anatomy Seminar; A morphological and experimental study of chromophilic, neurons in the cerebral cortex; Richard A. Miller: Subject to be announces; Harold Brody: 226 I. A.

II. CARCINOMA OF THE TONGUE

Donald Peterson,
and
K. W. Stenstrom

Time and experience has given carcinoma of the tongue an evil reputation. This reputation would be less grave than it is commonly supposed to be provided an early diagnosis is made. Cancer of the tongue is common, and benign tumors and inflammatory lesions are relatively rare, so that every wart, ulcer or nodule on the tongue should awaken in the practitioner the thought of cancer. A biopsy may then establish a diagnosis. Needless to say, the greatest success in treatment of any cancer lies in its prevention by skillful and thorough treatment of all lesions preceding cancer. Cancer develops because of ignorance, neglect and lack of alertness at the beginning. This is especially true of lingual cancers which give more variations as to problems of treatment and management than most other cancers because of their variable location, extent, duration, degree of malignancy and great tendency to metastasize.

Martin, et al, at the Memorial Hospital, New York, have estimated that carcinoma of the tongue incidence is 2-3% of all human cancer. According to their findings, lingual cancer represents 25 per cent of all intraoral cancers and 15 per cent of all tumors of the upper respiratory tract.

The present study was undertaken to determine the efficacy of treatment of lingual cancers at this hospital. The series is based upon 160 consecutive cases referred to and treated by the Radiation Therapy Department from 1926 through 1945. The common factor in all cases in this series is that each patient received some type of radiation therapy at sometime during the course of their disease. Those cases which received surgery alone as treatment are not included.

Twenty-three patients in this series

received their initial treatment elsewhere for their cancer and were referred to our department at a later date for retreatment of a local recurrence, local extension or cervical metastases. These are designated as "Retreats". The interval of time between their initial treatment elsewhere and their retreatment in this institution varied from 1½ months to 10 years with an average of 20.3 months. The remainder of this series (137) received their initial treatment here. In this latter group, the duration of symptoms varied from one week to two years with an average duration of symptoms of 4.7 months. This is in comparable agreement with the findings of other investigators who found an average duration of symptoms from 4 to 8.5 months. Sharp and Speckerman have correlated their final results with the average duration of symptoms and have found a higher percentage of 5-year survivals in those patients who had a shorter duration of symptoms. Only six patients in this series have a history of noting metastatic nodes as their primary symptoms; in the remainder, the first symptoms were referred to the primary lesion.

Age

The occurrence of carcinoma of the tongue is greatest in the 5th to 7th decade of life with its greatest incidence between the ages of 60 to 64 years. The disease may, however, develop in younger individuals, and Sigel has reported a case in a 6-year old boy. The age of the patients in this series varied from 33 to 90 years with a median age of 62 and an average age of 62.2 years. There appears to be sex difference in age incidence with the disease appearing at an earlier age in the female than in the male. All ages in this series are those of the patients at the time of admission to this hospital.

Sex

In this series, 122 (71.2%) were males. The sex incidence in different series shows a male predominance with a

variation from 70.8% to 87%. In general, a 4 to 1 ratio of males to females exists which may find its best explanation in the greater personal care in matters of mouth hygiene among women. Once the disease is established, however, this discrepancy ceases and the clinical features, course and response to treatment appear to be identical for the two sexes.

Etiology

Much has already been written about the etiology of cancer of the tongue and to reiterate the multiple etiological agents producing this cancer would be only a repetition. In 66 of our cases which listed a possible cause for the disease, the following is tabulated:

- In-
- 48 cases, history of irritation from teeth or dentures
 - 6 cases, history of leukoplakia
 - 4 cases, history of pimples or blisters on tongue
 - 3 cases, history of trauma to tongue
 - 2 cases, history of coating of tongue
 - 1 case, history of sore on tongue
 - 1 case, history of chewing tongue in sleep
 - 1 case, history of old mucous patch

Other investigators have found a history of leukoplakia in their series varying from 30 to 46 per cent. The reason for this apparent variance (11%) in this small group of 66 patients is not explained.

The relationship of carcinoma of the tongue and syphilis is of special interest. The incidence of these two diseases co-existing has been reported as varying from 20 to 41 per cent. Certainly when these two conditions coexist, the diagnosis is more difficult and the prognosis much worse. Martin reports that the onset of the carcinoma of the tongue occurs at an earlier age in patients with syphilis. The cancer appears to be preceded by a definite and prolonged luetic

lesion. Luetic lesions, such as localized wart-like epithelial hypertrophies, fissures, gumma as well as chronic glossitis with atrophy of the papillae, are considered to be precancerous. Pfahler has warned that a serological test should always be done but should never replace or delay biopsy. Twenty-three cases in our series gave a history of syphilis or had positive serology. Fifty cases had no serology reported, and thus the incidence of syphilis in the 110 cases with reported serology was 21 per cent.

Classification

The classification of carcinomas of the tongue is difficult. Richards, as well as Sharp and Speckerman, have attempted classification on the bases of the size of the primary lesion. This type of grouping did not appear to be suitable in this series as the number of lesions under 3 cm. in diameter is too small. The location of the primary lesion in the tongue anatomically is the most important single feature in the classification of the tongue carcinomas. This type of classification is of utmost importance both in regard to prognosis and to the choice of therapy in each individual case. It is not, however, without shortcomings as it offers no information either concerning local infiltration of the tumor into the surrounding structures or the presence of cervical node involvement. The following table is a comparative study of the locations of the primary lesions in this survey and those in others.

As noted in the other series, the location of the primary lesion is more commonly found on the lateral border of the tongue. In this series the higher incidence of lesions at the base of the tongue is probably because of the selection of the cases referred for radiation therapy. The left side of the tongue is involved more frequently than the right by a ratio of 3 to 2. Other investigators have observed a similar preponderance of lesions on the left side, but no explanation for this peculiarity has been forthcoming.

Location of Primary Lesion

	160 Cases Present Series		Martin et al 556 Cases		Richards 165 Cases		Sharp & Speckerman 27 Cases	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Base	81	51	Not given	33	42	26	3	11.1
Lateral	55	34		58	100	60	13	48.2
Under surface	13	8		4				
Tip	5	3		9	3	2	2	7.4
Entire tongue	2	1			20*	12	9*	33.3
Not reported	4	2						

*Dorsum

The presence or absence of metastases must be considered in the classification of carcinoma of the tongue. Pfahler has reported that 60-65 per cent of all carcinomas of the tongue have metastasized

at the time that medical assistance is first sought. We have tabulated the following chart to show the incidence of metastatic cervical lymph node involvement in other series in comparison with our own survey:

	U. of Minn. Series	Sharp & Speckerman 81 Cases	Martin et al 556 Cases
Metastatic lymph node at time of admission	58%	54%	39%
Developed metastatic nodes	<u>9%</u>	<u>11%</u>	<u>24%</u>
Total	67%	65%	62%

We have not attempted to classify metastatic lesions such as has been described by Richards.

Finally, extension of the primary lesion beyond the tongue, we feel, is of definite prognostic significance and should be considered in the classification of tongue cancers. 12.5 per cent of our cases had extension of primary lesion beyond the tongue with no evidence of metastatic lymph node involvement.

Thus, 70.5 per cent of this entire series had extension of the primary lesion beyond the tongue or cervical lymph node involvement at the time of admission to this hospital.

Thus, we have grouped carcinoma of the tongue in the following manner:

Group I: Carcinoma of the tongue with primary lesion localized to the tongue.

Group II: Carcinoma of the tongue with primary lesion invading adjacent structures. No cervical metastases.

Group III: Carcinoma of the tongue with palpable cervical lymph node metastases.

The 23 cases previously labeled as "Retreats" have been added to each of the preceding groups in the final analysis. These cases have been grouped as to whether their presenting symptoms were due to a local recurrence, local extension of the primary lesion, or cervical metastases.

Group IV has been added to include all those cases of clinical carcinoma of the tongue for whom no definite pathological diagnosis was available.

Biopsy

The following pathological diagnoses were made in the following number of cases:

- 133 squamous cell carcinoma
- 1 adenocarcinoma
- 26 clinical carcinoma (pathological diagnosis was not made or could not be rechecked)
 - (a) 2 cases in this group were lymphoepithelioma

Treatment

In the treatment of any malignancy, one should not be prejudiced in favor of radiation therapy or surgery, but should give patients the benefit of both methods solely with the idea of obtaining the best and most permanent results. At this hospital, where both expert surgery and all forms of radium and x-ray therapy are available, the treatment of carcinoma of the tongue is, for the most part, a combination of surgery and radiation therapy.

The initial effort in treatment is to control the primary lesion. The choice of method of therapy, whether surgical or radiation, depends upon the size and loca-

tion of the lesion as well as the general physical condition of the patient. Oral hygiene is of first importance. Dental prophylaxis is instituted with all teeth removed from the portion of the jaw which may be intensely irradiated to prevent osteoradionecrosis. Oral infection which is prevalent in lingual cancers is treated. All methods to build up the general physical condition of the patient are instituted; however, this is done during the treatments to prevent any loss of valuable time. Other situations, such as radiation sickness, dehydration and sore throats occurring as the result of radiation therapy, are dealt with as they present themselves. All of these measures, however, are only supplemental to the treatment of the tumor itself.

Fractionated Roentgen irradiation directed to the face and neck has usually been the method of choice in the treatment of the primary lesion. Multiple ports are used with the majority of the ports located on the same side as the lesion and angled towards the lesion. A submental port is also added for lesions located at the under surface of the tongue. Treatment is given daily to alternate ports until a dose of 1500 roentgens measured in air has been given to each port or until skin tolerance has been reached. In this manner, a large dose can be given to the lesion with only a moderate dose to the skin. A total dose of about 4000 tissue roentgens to the lesion has usually been delivered in a period of four weeks.

To this primary treatment, other radiation treatment is usually supplemented. If the lesion is located at the base of the tongue, radon seeds are implanted about the lesion after a course of roentgen therapy. Persistence of any primary lesion may be treated similarly. The use of an additional port directed straight on the lesion through the open mouth by way of an intraoral cone has been advocated by some radiation therapists. This method is in use here at the present time although none of the patients in this group were so treated.

The use of this cone is restricted to small lesions located on the anterior half of the tongue. Other therapists have advocated the use of radium needles placed into the primary lesion and left there until a certain dosage had been obtained after which they are removed. This is used in lieu of both external irradiation and radon. We have not used radium needles because they do not appear to offer any advantage over radon implants. The radon implants are easier to handle, and if a good distribution of the implants is obtained, it is doubtful that there is any advantage of one method over the other. The possibility of necrosis with a slough of the tumor is greater with the use of radon, but this should not occur if the distribution of radon has been satisfactory and gold implants with a 0.3 mm. gold wall are used. Radon has occasionally been used alone or in conjunction with surgery in this series. Its use in this manner has been restricted to smaller lesions on the anterior portion of the tongue.

Other methods of irradiation have been advocated in the treatment of the primary lesions. Radium tubes applied to the surface of the lesion have been used, but have been discarded for the most part because of the severe reaction produced on the surface from a large surface dose with an inadequate tumor dose at depth. External radium packs and bombs have also been used, but these appear to have no advantage over roentgen therapy.

The treatment of cervical lymph node metastases is as varied as the treatment of the primary lesion. Protracted external irradiation followed by radon implantation has been used for large cervical masses. External irradiation alone may be used in cases in which there is rather extensive cervical involvement. Likewise, radon implants alone may be used in single metastases. The choice of treatment varies with the nature and extent of the involvement. Radical neck dissection is undoubtedly the most important weapon in dealing with cervical metastases when they are limited to one side and no contraindications to surgery are present. Any one or a combination of any of these

methods of treating cervical metastases has been used in those cases in this series who already had cervical lymph node involvement on admission or who later on developed such metastases. The method of choice was determined by the nature of the involvement.

In this series, the treatment given to most of the patients represented a combination of surgery and radiation therapy. As mentioned previously, radiation therapy of some type is the common factor which groups this series together. Some patients were moribund at the time they were referred for x-ray therapy and these did not receive adequate treatment. Others refused adequate treatment. The best analysis of treatment available is the grouping of this series of patients according to the method or combination of methods of treatment:

- 70 received x-ray and radon
- 51 received x-ray and radon and surgery
- 18 received x-ray alone
- 5 received x-ray and surgery
- 1 received radon alone
- 5 received radon and surgery
- 7 received inadequate x-ray
- 2 received inadequate x-ray and radon
- 1 received inadequate x-ray and surgery

Final Results

We have tabulated our final results according to the classification of the lesion previously mentioned:

CANCER OF THE TONGUE - LESION LIMITED TO THE TONGUE

GROUP I FIRST TREATMENTS

Year	No. of Cases	Years of Survival													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Living
1926	1														
1927	1	1	1	1	1	1	1	1	1	1	1	1	1*		
1930	1	1	1												
1931	1	1	1	1	1	1	1	1	1	1	1	1			
1932	1	1	1	1	1	1	1								
1933	4	3	3	2	2	2	2	2	2	2	2	2	2	2	
1934	1														
1935	4	3	3	3	2	2	1	1	1						
1936	2														
1937	2	2	1	1	1	1	1	1	1	1 ^x				1	
1940	2	1													
1941	4	2	2	1	1	1								1	
1942	3	1													
1943	2	2	2	2										2	
1945	2	2													
Cases	31	31	29	29	27	24	20	18	18	18	16	14	10	9	8
Survival		20	15	12	9	9	7	6	6	5	4	4	3	2	
Per Cent		64	51	41	33	37	35	33	33	27	25	28	33	22	

*Case lost

^xAlive with disease 1-1-47
 (Expired 1-26-47)

No cases were reported for the following years: 1928, 1929, 1938, 1939, 1944.

CANCER OF THE TONGUE - LESION LIMITED TO THE TONGUE

GROUP I RETREATMENTS

Year	No. of Cases	Years of Survival											
		1	2	3	4	5	6	7	8	9	Living		
1930-1936	2	2	2	2	2	2	2						
1937	2	2	2	1	1	1	1	1	1	1	1		1
1940	1	1											
1941	1	1	1	1	1	1							
Total	6	6	5	4	4	4	3	1	1	1			1

No cases reported for 1938, 1939, 1942, 1943, 1944, 1945.

CANCER OF THE TONGUE - LESION LIMITED TO THE TONGUE

TOTAL GROUP I - FIRST TREATMENTS AND RETREATMENTS

Year	No. of Cases	Years of Survival													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Living
Total	37	37	35	35	33	29	24	22	22	22	18	16	12	11	9
Survival		26	20	16	13	13	10	7	7	6	4	4	3	2	
Per Cent		70	57	46	39	44	41	32	32	27	22	25	25	18	

Group I

As is to be expected, the survival rate in this group is the best in the series. Only 11 of the patients (7 per cent of the entire series) had lesions whose location and size might satisfy surgical excision of the primary lesion. Four in this small group had surgery on the primary lesion; in the remaining seven cases, surgery was contraindicated for one reason or another. Nine other patients in this group had syphilis of which only one survived over five years. In five out of the nine patients

with syphilis, the primary lesion involved over one-half of the tongue. Of the remaining cases in the Group (17), the size of the lesion, its location or some other factors contraindicated surgery. No attempt has been made to classify the lesions localized to the tongue according to size and location as recommended by Richards and Sharp and Speckerman. The number of lesions under 3 cm. in diameter in this series are too few in number to adequately group them in the above manner.

CANCER OF THE TONGUE WITH INVOLVEMENT OF ADJACENT STRUCTURES;
NO CERVICAL METASTASES

GROUP II FIRST TREATMENTS

Year	No. of Cases	Years of Survival								
		1	2	3	4	5	6	7	8	Living
1929-1933	2	2	2							
1934	1									
1936	2	1	1	1	1	1	1	1	1	
1937	1									
1938	2	2	1	1	1	1	1	1	1	1
1941	1									
1943	2	1								
1944	4	4	1							
1945	3	1								1
Cases	18	18	15	11	9	9	8	8	8	2
Survival		11	5	2	2	2	2	2	2	
Per Cent		61	33	18	22	22	25	25	25	

No cases reported in 1935, 1939, 1940, 1942.

GROUP II RETREATMENTS

1944	1	1	1							1*
1945	1	1								1

*Living with disease

TOTAL GROUP II FIRST TREATMENTS AND RETREATMENTS

Cases	20	20	16	11	9	9	8	8	8	4
Survival		13	6	2	2	2	2	2	2	
Per Cent		65	37	18	22	22	25	25	25	

Group II

In this group, extension of the primary lesion beyond the tongue into adjacent structures appears to have a definite effect upon the 5-year survival rate.

Most of the lesions in this group were located at the base of the tongue where the carcinomas are more highly malignant and infiltrate and metastasize early.

CANCER OF THE TONGUE WITH CERVICAL METASTASES

GROUP 3 FIRST TREATMENTS

Year	No. of Cases	Years of Survival								Living
		1	2	3	4	5	6	7	8	
1927-29	1	1								
1930	6	3	3	2	2	2	1			
1931	6	2	1							
1932	3	2	2	1	1					
1934	1									
1935										
1936	3	1								
1937	3	1	1	1	1	1	1	1	1	1*
1938	4	1								
1939	3	1								
1940	9	3	2	2	2	2 ^x	1			1
1941	4	2	1	1	1	1				
1942	3	1	1	1						
1943	7	3	1							
1944	5	1	1							1
1945	1	1								1
Cases	62	62	61	56	49	46	42	33	30	3
Survival		24	14	8	7	6	2	1	1	
Percent		39	23	14	14	13	5	3	3	

*Lost contact-no recurrence.

^xLast seen with possible recurrence.

GROUP 3 RETREATMENTS

Year	No. of Cases	Years of Survival				
		1	2	3	4	Living
1928-1930	1					
1931--1934	2	2				
1935	1					
1936	2	1				
1937	1	1	1	1	1	
1938	1					
1939						
1940	3					
1941						
1942						
1943						
1944	3					
1945	1					
Cases	15	15	14	11	11	0
Survival		4	1	1	1	
Percent		27	7	9	9	

GROUP 3 FIRST TREATMENT AND RETREATMENT

Cases	77	75	67	60	57	53	41	38	3
Survival	28	15	9	8	6	2	1	1	
Percent	36	20	13	13	11	4	2	2	

Group III

As is to be expected, the incidence of 5-year survivals is the lowest in this group. It is of interest to note that in all the patients in this group who had a primary lesion localized to the tongue and with cervical lymph node involvement, (34) the average duration of life after the initial treatment was 21.9 months. This is to be compared with an

almost equal group (28) in which the primary lesion had invaded adjoining structures and with cervical metastases whose average duration of life was only 13.3 months. This again reemphasizes the higher degree malignancy of the infiltrating tumors of the tongue and suggests the prognostic significance of extension into adjacent structures.

CANCER OF THE TONGUE - NO PATHOLOGICAL DIAGNOSIS

GROUP IV

Year	No of Cases	Years of Survival														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Living
1936	2	1	1	1	1	1										
1927	1															
1929	2	1	1	1												
1930	1	1														
1931	2	2	2	1	1	1	1	1	1	1	1	1	1 ^x			
1932	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1*	1
1936	3	1	1	1												
1937	2															
1938	2	2*	1	1	1	1	1									
1939	1															
1940	1															
1941	1	1	1													
1943	3															
1945	2															
Cases	26	26	24	24	21	21	20	19	18	16	14	11	11	11	11	1
Survival		11	7	5	3	3	3	2	2	2	2	2	2	1	1	
Per Cent		42	29	20	14	14	15	10	11	12	14	18	18	9	9	

^xDied from recurrence 12 years after the initial primary lesion

*Probable lymphoepitheliomas

No cases reported in 1928, 1933, 1934, 1935, 1942, 1944.

Group IV

This grouping includes all of those cases in which the clinical diagnosis of carcinoma of the tongue was made, and, in which no definite pathological diagnosis was available. The only living patient in this group who has survived over 14 years had a clinical diagnosis of lymphoepithelioma. One other case had a similar diagnosis. All of these cases would fall into either one of the first three groupings as to the localization of the primary lesion with or without extension or metastases. The low survival rate in this group is explained by the fact that more of these patients were in Groups II and III than Group I. Only four patients in this group would fall into the Group I classification.

Analysis

The 5-year survival rate in this entire series was 22.9 per cent. Twenty-four of the 105 patients with carcinoma of the tongue seen at the University of Minnesota Hospitals in this series up to 1941 survived over 5 years. Of these 24 cases, only seven are known to be living and well today. Three patients were lost and five are dead from other causes.

Of the remainder (nine cases), five died with recurrences 5 years or more after their initial treatment in this hospital and four died with probable persistence of the original carcinoma, five years or more after initial treatment.

In comparing the 5-year survival rate with series reported by other investigators using radiation therapy or radium, our survival figure is relatively lower, Richards reports 27 per cent 5-year survivals as does Pfahler. Martin et al reports 25 per cent 5-year survival while Sharp and Speckerman, in a more select group, report 31.3 per cent. Of more interest to us is a comparison with Sharp and Speckerman's small series with regards to survival rate of lesions classified as to the location of the primary lesion.

The following chart shows the comparison:

COMPARATIVE RESULTS LOCATION, FIVE-YEAR SURVIVALS

	160 Cases Present Series			27 Cases Sharp and Speckerman		
	No. Cases up to 1941	No. of 5-year Survival	Percent	No. of Cases	No. of 5-year Survival	Percent
Base	59	11	18	3	0	0
Lateral	31	9	29	13	5	30.8
Under surface	6	3	50	9*	1	11.1
Tip	5	1	20	2	1	50
Entire tongue	2					
Not reported	2					
Total	105	24	22.9	27	7	31.8

*Dorsum

Summary

1. 160 cases of carcinoma of the tongue referred to the Radiation Therapy Department for treatment sometime during the course of their disease are reviewed and a 22.9 per cent 5-year survival reported.
2. The relatively low survival in our group, we believe, is mainly due to two facts; namely, that some of the most favorable cases had surgery only and were, therefore, excluded from this series; and, secondly, that a large proportion of the patients had the primary lesion located at the base of the tongue and far advanced lesions.
3. The prognostic significance of extension of the primary lesion beyond the tongue both with and without cervical metastasis is emphasized.
4. In spite of methods to improve different techniques in administering radiation therapy, no difference in the survival rate has been noted in the first 10-year period as compared with the second.

References

1. Cade, Stanford:
Cancer of the Tongue.
Practitioner 143:40, July '39.
2. Cutter, M.
Concentration Method of Radiotherapy
J.A.M.A. 117 Nov. 8, '41.
3. Ewing, James
Neoplastic Disease.
W. B. Saunders Co. pp. 888-894.

4. Martin, Hayes E.
Five-Year End-Results in the
Treatment of Cancer of the
Tongue, Lip and Cheek.
S. G. O. 65:793, Dec. '37.
5. Martin, Hayes E., Munster,
Helmar, Sugarbaker, Everett D.
Cancer of the Tongue.
Arch. Surg. 41:4, Oct. '40.
6. Morrow, Albert S.
Cancer of the Tongue.
Ann. Surg. 105:418, March '37.
7. Pack, G. I. and Livingston,
E. M.
Treatment of Cancer and Allied
Diseases.
Vol. 2 Chapter XVIII.
8. Pfahler, George E.
Treatment of Cancer of Lip and
Mouth.
Radiology '40, 35.
9. Richards, G. E.
Treatment of Cancer of the
Tongue.
Am. J. Roent. 47:191, Feb. '42.
10. Sharp, George S. and Speckerman,
Harold D.
Cancer of the Tongue.
Am. J. Roent. 57:2, Feb. '47.
11. Thoma, Kurt
Oral Pathology.
C. V. Mosby Co., pp. 117