

TABLE 134
CANCER OF THE PALATE IN AUSTRALIA BY SEX, SITE, and DIAGNOSIS. (1959-1964 INCLUSIVE).

SEX		M A L E										F E M A L E										MALE and FEMALE TOTAL	
SITE		HARD PALATE		SOFT PALATE		HARD and SOFT PALATE		PALATE, UNSPECIFIED		PALATE, TOTAL		HARD PALATE		SOFT PALATE		HARD and SOFT PALATE		PALATE, UNSPECIFIED		PALATE, TOTAL		MALE and FEMALE TOTAL	
DIAGNOSIS		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
SQUAMOUS CELL CARCINOMA		14	63.6	37	74.0	3	75.0	17	45.9	71	62.8	15	45.5	4	30.8	1	50.0	4	21.1	24	35.8	95	52.8
ADENOID CYSTIC CARCINOMA		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	15.8	3	4.5	3	1.7
MUCOEPIDERMOID CARCINOMA		-	-	-	-	-	-	-	-	-	-	-	-	2	15.4	-	-	-	-	2	3.0	2	1.1
ADENOCARCINOMA		3	13.6	-	-	-	-	5	13.5	8	7.1	4	21.1	-	-	1	50.0	-	-	5	7.5	13	7.2
UNSPECIFIED MIXED SALIVARY GLAND TUMOUR		2	9.2	1	2.0	-	-	2	5.4	5	4.4	3	9.1	3	23.1	-	-	-	-	6	9.0	11	6.1
CARCINOMA, UNSPECIFIED		3	13.6	12	24.0	1	25.0	13	33.2	29	25.7	11	33.3	4	30.7	-	-	12	63.1	27	40.2	56	31.1
TOTAL		22	100.0	50	100.0	4	100.0	37	100.0	113	100.0	33	100.0	13	100.0	2	100.0	19	100.0	67	100.0	180	100.0

87.

total 95 patients with squamous cell carcinoma, the site distribution of the lesions are as follows - 29 (30.5 per cent.) on the hard palate, 41 (43.2 per cent.) on the soft palate, 4 (4.2 per cent.) on both the hard and soft palate, and in 21 cases (22.1 per cent.), the specific site of the palate involved is not mentioned in the case histories.

The preponderance of squamous cell carcinoma in patients with cancer of the palate in the present series is in accord with the findings of Beiswanger and Stenstrom,³² New and Hallberg,²³⁴ and Martin.¹⁹⁹

TREATMENT

The type of treatment given to patients with primary malignancy of the palate in Australia is contained in Tables 135 and 136. Generally speaking, the treatment of patients with this disease is influenced by two main factors - the histologic type of the tumours, and their location.

Of 89 patients with squamous cell carcinoma, 70.8 per cent. received radiotherapy, 15.7 per cent. had surgery, and in 13.5 per cent., a combination of radiotherapy and surgery was used. Radiotherapy was used more often in patients with lesions involving the soft palate. Of the 101 patients who were treated by radiotherapy, 41 (40.6 per cent.) had cancer of the soft

TABLE 136

CANCER OF THE PALATE IN AUSTRALIA (1959-1964 INCLUSIVE)
DIAGNOSIS vs. TREATMENT

TYPE OF TREATMENT	RADIO- THERAPY		SURGERY		RADIOTHER- APY and SURGERY		TOTAL
DIAGNOSIS	No.	%	No.	%	No.	%	
SQUAMOUS CELL CARCINOMA	63	70.8	14	15.7	12	13.5	89
ADENOID CYSTIC CARCINOMA	-	-	3	100.0	-	-	3
MUCOEPIDERMOID CARCINOMA	-	-	1	100.0	-	-	1
ADENOCARCINOMA	4	30.8	8	61.5	1	7.7	13
UNSPECIFIED MIXED SALIVARY GLAND TUMOUR	-	-	9	90.0	1	10.0	10
CARCINOMA, UNSPECIFIED	34	66.7	14	27.4	3	5.9	51
TOTAL	101	60.5	49	29.3	17	10.2	167

palate, 25 (24.8 per cent.) had malignancy of the hard palate, 5 (5 per cent.) had their lesions involving both hard and soft palate, and in 30 (29.6 per cent.) patients, the specific site of the palate involved is not recorded.

In the group of 27 patients treated for malignancy of the salivary gland type, 21 (77.8 per cent.) had surgery, 4 (14.8 per cent.) received radiotherapy, and 2 (7.4 per cent.) had radiotherapy and surgery. In the total group of 49 patients who were treated by surgery, 20 (40.8 per cent.) had malignancy of the hard palate, 13 (26.5 per cent.) had cancer of the soft palate, 1 (2.4 per cent.) had the lesion involving both hard and soft palate, and in 15 (30.3 per cent.) cases, the specific site of the palate involved is not recorded in the case histories.

In the group of 51 patients with carcinoma unspecified, 34 (66.7 per cent.) had radiotherapy, 14 (27.4 per cent.) were treated by surgery, and 3 (5.9 per cent.) had both surgery and radiotherapy. Since there are more patients treated by radiotherapy than surgery in this group, it is reasonable to assume that most of the patients had squamous cell carcinoma.

Of the total 17 patients who were treated by a combination of radiologic and surgical techniques, 6 (35.3 per cent.) had cancer of the hard palate, 5 (29.4

per cent.) had malignancy of the soft palate, and in 6 (35.3 per cent.) patients, the specific site of the palate involved is not known. In this group of 17 patients, 12 had squamous cell carcinoma, 2 had cancer of the salivary gland type, and in 3 patients, a diagnosis of "carcinoma" only was recorded.

When individual states are taken into consideration, the main types of treatment used in the management of patients with palatal malignancy as seen in the different states are as follows:

	Radio- therapy %	Surgery %	Radiotherapy and Surgery %	Total No. of cases
NEW SOUTH WALES	58.6	31.4	10.0	72
VICTORIA	50.0	40.0	10.0	41
QUEENSLAND	90.5	4.8	4.7	21
SOUTH AUSTRALIA	40.0	30.0	30.0	11
WESTERN AUSTRALIA	57.1	38.1	4.8	21
TASMANIA	60.0	20.0	20.0	5

A breakdown of the types of radiotherapy used in the treatment of patients with this disease is contained in Table 137. DXRT is the most common form of radiotherapy used - 22.3 per cent. of 121 patients who received radiotherapy. There are more female patients (30.5 per cent.) who received DXRT than male patients (18.8 per cent.), and more patients with malignancy of

TABLE 137
CANCER OF THE PALATE IN AUSTRALIA BY SEX, SITE and TREATMENT BY RADIOTHERAPY (1959-1964 INCLUSIVE).

SEX		MALE												FEMALE								MALE and FEMALE TOTAL	
SITE	TYPE OF RADIOTHERAPY TO PRIMARY	HARD PALATE		SOFT PALATE		HARD SOFT PALATE		PALATE, UNSPECIFIED		PALATE, TOTAL		HARD PALATE		SOFT PALATE		PALATE, UNSPECIFIED		PALATE, TOTAL		No.	%		
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
SXRT		-	-	-	-	-	-	-	-	-	-	1	5.5	-	-	-	-	1	2.8	1	0.8		
MVT		4	28.6	11	26.2	2	50.0	5	20.0	22	25.9	1	5.5	-	-	-	-	1	2.8	23	19.0		
DXRT		-	-	10	23.8	-	-	6	24.0	16	18.8	3	16.8	3	50.0	4	36.4	11	30.5	27	22.3		
XRT		-	-	8	19.0	1	25.0	2	8.0	11	12.9	1	5.5	-	-	4	36.4	5	13.9	16	13.2		
UNSPECIFIED		5	35.7	6	14.3	-	-	5	20.0	16	18.8	7	38.9	2	33.3	-	-	9	25.0	25	20.7		
IMPLANT		-	-	2	4.8	-	-	-	-	2	2.4	1	5.5	-	-	-	-	1	2.8	3	2.5		
and XRT		-	-	1	2.4	-	-	2	8.0	3	3.5	-	-	-	-	1	9.1	1	2.8	4	3.2		
RADIOTHERAPY UNSPECIFIED		5	35.7	4	9.5	1	25.0	5	20.0	15	17.7	4	22.3	1	16.7	2	18.1	7	19.4	22	18.3		
COBALT 60		14	100.0	42	100.0	4	100.0	25	100.0	85	100.0	18	100.0	6	100.0	11	100.0	36	100.0	121	100.0		
TOTAL																							

mm.

the soft palate (48.1 per cent.) were treated by this form of irradiation than patients with cancer of the hard palate (11.1 per cent.).

Implant is the next commonest form of radiotherapy used - 20.7 per cent. Slightly more female patients (25 per cent.) than male patients (18.8 per cent.) were treated by this method. This form of radiotherapy was used slightly more often in patients with malignancy of the hard palate (48 per cent.) than those whose lesions involved the soft palate (32 per cent.). Table 138 shows the type of implant used in the treatment of patients with palatal malignancy. Radon was most popularly used, next is radium, and then radioactive gold.

The third most common form of radiotherapy used was MVT (19 per cent.) and it was used more often in male patients (25.9 per cent.) than in female patients (2.8 per cent.), and also more often in patients with cancer of the soft palate (47.8 per cent.) than those with malignancy of the hard palate (21.7 per cent.)

Cobalt 60 is next in frequency of usage - 18.3 per cent. It was used slightly more often in female patients (19.4 per cent.) than in male patients (17.7 per cent.), and it appears that more patients with cancer of the hard palate (40.9 per cent.) received this

TABLE 138
CANCER OF THE PALATE IN AUSTRALIA BY SEX, SITE, and TYPE OF IMPLANT TO PRIMARY. (1959-1964 INCLUSIVE).

SEX	MALE							FEMALE						
TYPE OF IMPLANT	RADON		RADIUM		RADIOACTIVE GOLD		TOTAL	RADON		RADIUM		RADIOACTIVE GOLD		TOTAL
SITE	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
HARD PALATE	4	80.0	1	20.0	—	—	5	4	50.0	2	25.0	2	25.0	8
SOFT PALATE	6	75.0	1	12.5	1	12.5	8	2	100.0	—	—	—	—	2
HARD and SOFT PALATE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PALATE, UNSPECIFIED	5	100.0	—	—	—	—	5	—	—	—	—	—	—	—
PALATE, TOTAL	15	83.3	2	11.1	1	5.6	18	6	60.0	2	20.0	2	20.0	10

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form of radiotherapy than those with malignancy of the soft palate (22.7 per cent.)

These are the four main types of radiotherapy that have been used to treat patients with palatal cancer. There is a group of 16 patients (out of the 121 patients who received radiotherapy) who were treated by some form of X-ray irradiation not specified in the case histories of these patients.

From a review of the literature, James¹⁰⁴ and Martin¹⁹⁹ indicate that generally, epidermoid carcinomas on the hard palate should be removed surgically, because of the ill-effects of irradiation on the underlying bone, while those occurring on the soft palate are best treated by radiologic means. On the other hand, adenocarcinomas are usually treated by surgery regardless of their location on the palate, because of their radio-resistant nature. New and Hallberg²³⁴ share this opinion, but add that the use of implant for extensive adenocarcinoma in which complete surgical removal is not possible could be of much value.

Advocates of surgery in the treatment of patients with primary cancer of the palate include Thoma,³⁶⁸ Shirokov,³¹³ and Halperin.¹²⁹

In the treatment of positive cervical lymph node metastases, James¹⁴⁰ and Shirokov³¹³ indicate that surgery is the preferred treatment of choice. On the

other hand, Martin¹⁹⁹ states that the treatment of palpable metastatic node involvement by epidermoid carcinoma on admission is by irradiation because in many instances, if metastases are present on admission, the primary growth is usually far advanced and is best treated radiologically. However, he indicates that if metastases develop after the primary growth has been controlled, radiotherapy is usually used if the metastases are bilateral or if the primary tumour is sited in the midline of the palate, indicating a possible development of bilateral nodes, while neck dissection is usually preferred in instances of unilateral and homolateral metastases from primary epidermoid carcinoma not involving the midline of the palate.

In the present study, of a small group of 20 patients treated for cervical lymph node involvements, 80 per cent. received radiotherapy to the secondary of the disease, and 20 per cent. had neck dissection (Table 139).

PROGNOSIS

The prognosis of patients with palatal cancer is summarised in Table 140. The crude cumulative five year survival rate for 112 male patients is 39.7 per cent. and that for 65 female patients is 61.1 per cent. The corresponding relative five year survival ratios

TABLE 139

CANCER OF THE PALATE IN AUSTRALIA
TREATMENT TO METASTASES

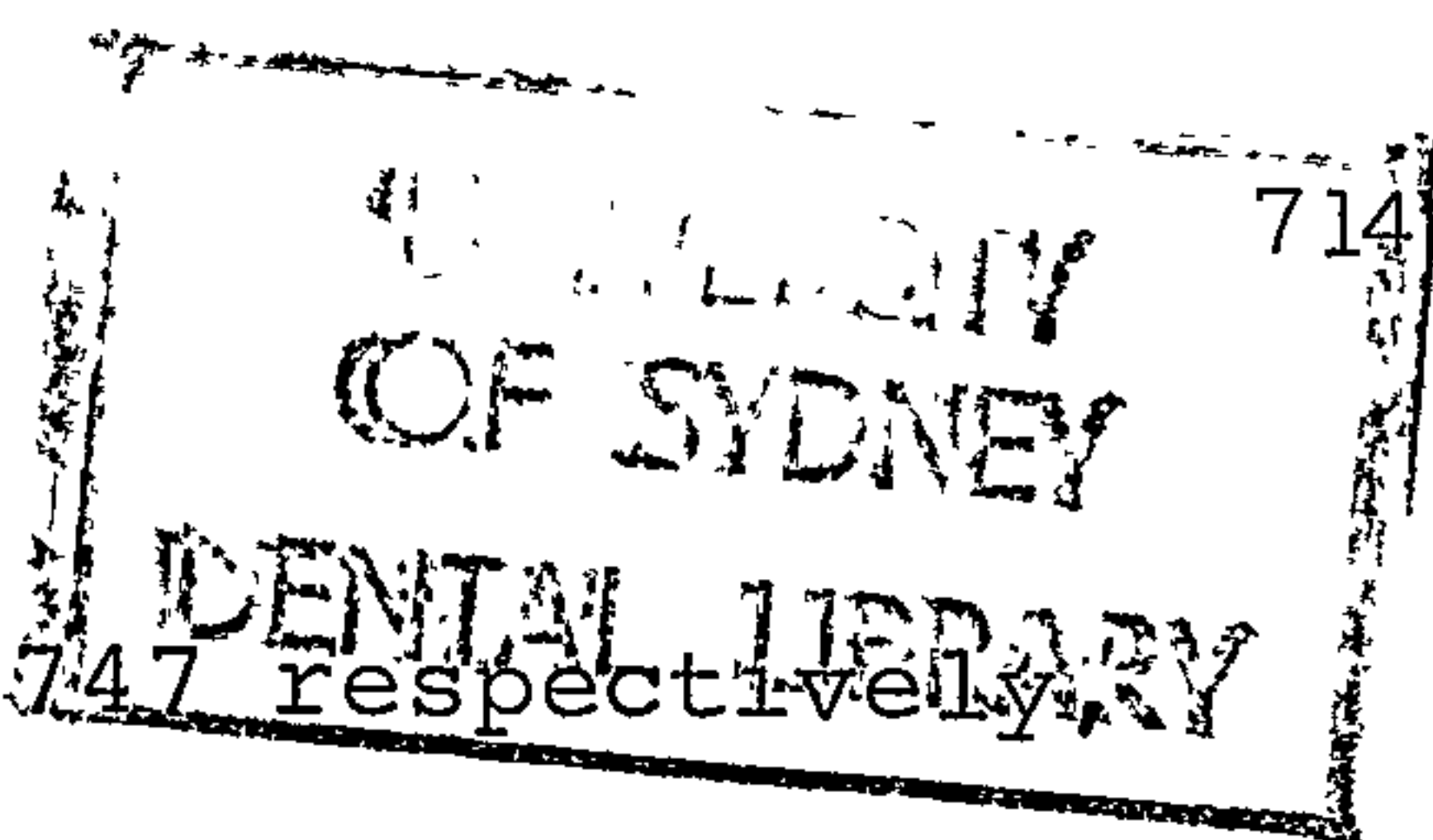
TYPE OF TREATMENT TO SECONDARY	RADIOTHERAPY		SURGERY		TOTAL
SITE	No.	%	No.	%	
PALATE	16	80.0	4	20.0	20

TABLE 140

CANCER OF THE PALATE IN AUSTRALIA. PROGNOSIS

	Total no. of cases		Crude Cumulative five year survival rate (Per cent.)		Expected five year survival rate (Per cent.)		Relative five year survival ratio	
	Male	Female	Male	Female	Male	Female	Male	Female
PALATE, TOTAL	112	65	39.7	61.1	77.1	81.7	0.515	0.747
PALATE, SOFT	50	*	36.9	-	75.5	-	0.488	-
PALATE, HARD	*	*	-	-	-	-	-	-
PALATE, TOTAL - PATIENTS TREATED BY RADIOTHERAPY	72	*	29.2	-	76.5	-	0.382	-
PALATE, TOTAL - PATIENTS TREATED BY SURGERY	*	*	-	-	-	-	-	-
PALATE, TOTAL - PATIENTS WITH SQUAMOUS CELL CARCINOMA	71	*	37.4	-	83.5	-	0.448	-
PALATE, TOTAL - PATIENTS WITH SALIVARY GLAND TYPE MALIGNANCY	*	*	-	-	-	-	-	-

* Number of patients in the group is too small to work out correct five year survival rate.



for male and female are 0.515 and 0.747 respectively indicating a definite better five year survivals in the group of female patients. This is partly because proportionately, in the group of male patients, there are more cases of squamous cell carcinoma (62.8 per cent.) than in the female group of patients (35.8 per cent.) who have proportionately more tumours of the salivary gland type.

For 50 male patients with cancer of the soft palate, the crude cumulative five year survival rate is 36.9 per cent., and the relative five year survival ratio is 0.488. Unfortunately, the number of male (or female) patients with malignancy of the hard palate is too small to enable the calculation of an accurate five year survival rate for comparison.

In the group of 72 male patients who were treated radiologically, a crude cumulative five year survival rate of 29.2 per cent. and a relative five year survival ratio of 0.382 was achieved. The groups of patients treated by surgery are too small to work out accurate five year survival rates.

For 71 male patients with squamous cell carcinoma of the palate, the crude five year survival rate is 37.4 per cent. and the survival ratio, 0.448. The number of patients with malignancy of the salivary gland type is

too small for calculation of an accurate five year survival rate for comparison.

The prognosis of patients with this disease as indicated in the literature from other studies are as follows:

	Five year survivals %	Five year cures %	Total Number
NEW and HALLBERG ²³⁴	(86.5 ((33.3	- - -	53 cases, adeno- carcinomas 60 cases, SCC
MARTIN ¹⁹⁹	-	23	79 cases

ORAL SARCÓMAS AND MALIGNANT MELANOMA

GENERAL INCIDENCE

There are 12 patients with oral malignant melanoma and 16 patients with various types of oral sarcomas registered in the major hospitals in Australia from 1959 to 1964 inclusive. During the same period, there are 5,794 patients with oral carcinomas. Thus, malignant melanoma constitutes 0.2 per cent. of all oral cancer seen in these hospitals, and sarcoma makes up 0.3 per cent.

SEX INCIDENCE

Of the 12 cases of oral malignant melanoma, there are 8 male patients and 4 female patients.

In the group of patients with oral sarcomas, there are 11 males and 5 females.

AGE INCIDENCE

The average age of 12 patients with oral malignant melanoma is 68.8 years; the youngest patient is 42 years old, and the oldest patient, 88 years of age.

For the 16 patients with oral sarcomas, the average age is 45.2 years, with an age range of from 10 to 83 years.

SITE OF OCCURRENCE

The palate appears to be the site of predilection for patients with oral malignant melanoma - 6 cases.

Next in frequency of involvement is the buccal mucosa of the cheek, 4 cases, then the floor of the mouth, 1 case, and the parotid gland, 1 case (Table 141).

Of the 16 cases with oral sarcomas, 5 patients had the lesion sited on the palate, 3 with the malignancy on the lower jaw, 2 each with the lesion on the lower lip, tongue, and maxilla, and one each with malignancy on the buccal mucosa of the cheek and the parotid gland (Table 141).

HISTOPATHOLOGIC TYPES

In the group of patients with oral sarcomas, there are 5 cases of fibrosarcomas, 3 cases of rhabdomyosarcoma, 2 cases of leiomyosarcoma, 2 cases of reticulum cell sarcoma, 2 cases of lymphosarcoma, 1 case each of osteogenic sarcoma, and chondrosarcoma (Table 141).

TREATMENT

The treatment of choice for patients with oral malignant melanoma and those with oral sarcomas is surgery. In the former group of patients, 8 were treated by surgery, 1 by radiotherapy, and 3 by electrocoagulation or surgical diathermy, whereas in the later group

TABLE 141
ORAL SARCOMAS and MALIGNANT MELANOMA BY SITE and SEX

SITE	DIAGNOSIS	LOWER LIP		TONGUE		PAROTID GLAND		FLOOR OF MOUTH		MANDIBLE, LOWER JAW.		PALATE		BUCCAL MUCOSA OF CHEEK		MAXILLA		TOTAL	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
	MALIGNANT MELANOMA	-	-	-	-	1	1	-	-	-	-	4	2	2	4	-	-	8	12
	RETICULUM CELL SARCOMA	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	2	2
	FIBROSARCOMA	-	-	-	-	-	1	-	-	2	-	1	-	1	1	-	3	2	5
	OSTEOGENIC SARCOMA	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1
	CHONDRO-SARCOMA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1
	LYMPHO-SARCOMA	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	2	2	2
	LEIOMYO-SARCOMA	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2
	RHABDOMYO-SARCOMA	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	1	2	3
	TOTAL	2	-	1	1	1	2	1	1	2	1	8	3	2	3	2	19	9	28

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TABLE 142
ORAL SARCOMAS and MALIGNANT MELANOMA. TYPE OF TREATMENT TO PRIMARY.

TYPE OF TREATMENT	RADIOTHERAPY	SURGERY	RADIOTHERAPY and SURGERY	ELECTROCOAGULATION (SURGICAL DIATHERMY)	TOTAL
MALIGNANT MELANOMA	1	8	—	3	12
RETICULUM CELL SARCOMA	1	1	—	—	2
FIBROSARCOMA	—	4	1	—	5
OSTEOGENIC SARCOMA	—	1	—	—	1
CHONDROSARCOMA	—	—	1	—	1
LYMPHOSARCOMA	2	—	—	—	2
LEIOMYOSARCOMA	—	2	—	—	2
RHABDOMYOSARCOMA	—	1	2	—	3
TOTAL	4	17	4	3	28

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of patients, 9 had surgery, 3 received radiotherapy, and 4 were treated by a combination of both methods (Table 142).

PROGNOSIS

The prognosis of patients with oral malignant melanoma and those with oral sarcomas is poor.

DEFICIENT ASPECTS OF CASE RECORDS

The information of the present Australian oral cancer study is based on a personal examination of the medical case histories of patients with the disease registered in the major hospitals around Australia. This section is devoted to bringing into notice certain aspects of the case histories examined which are unsatisfactory and inadequate with regards to the information they contain.

Usually, two sources of patients case histories are available - those in the radiotherapy department, and those kept in the general medical record department. The author usually consulted the former first, and then the latter to pick out surgical cases only. On the whole, medical records of patients in radiotherapy units are superior and better kept than those in the general medical record department. The case histories of patients in radiotherapy units usually contain more detailed information in an orderly fashion and, in many instances, they are neatly typed to facilitate reading through them.

The deficient aspects of the case history will be pointed out according to the medical case records of patients with malignancy of each specific oral site

as follows:

1. MEDICAL CASE RECORDS OF PATIENTS WITH LIP CANCER

In the majority of instances, there is no differentiation between malignancy of the mucosa part of the lip (I.C.N.140) and the skin part of the lip (I.C.N.191.0).

Of 3,086 male patients with lip cancer, there are 666 cases (21.5 per cent.) in which the case histories do not indicate whether the right side, the left side, or the centre of the lip is involved by the disease. Similarly, this deficiency is seen in the case histories of 131 female patients (27.1 per cent.) out of 483 cases.

The case histories of 81 patients (2.3 per cent. of 3,569 cases) simply record a diagnosis of carcinoma, with no specification of histologic type. Presumably, the majority are squamous cell carcinoma.

In 2,728 patients who had radiotherapy, 246 patients (9.0 per cent.) had some form of X-ray irradiation not specified. Presumably, most of these patients received SXRT.

2. MEDICAL CASE RECORDS OF PATIENTS WITH TONGUE CANCER

There are 462 patients (65.6 per cent. of 704 cases) whose case histories do not indicate whether the posterior one-third (base) or the anterior two-thirds

of the tongue is involved by the disease. The importance of this is that patients with malignancy of the posterior portion of the tongue usually have a poorer prognosis than those with cancer of the anterior two-thirds of this organ.

The case histories of 176 male patients (35.9 per cent. of 490 cases) simply record a diagnosis of carcinoma with no specification of histologic type, although it is reasonable to assume that most, if not all, of these are squamous cell carcinoma. Similarly, this deficiency is seen in the case histories of 69 female patients (32.2 per cent. of 214 cases).

In a group of 556 patients who received radiotherapy, 73 cases (13.1 per cent.) were given some form of X-ray irradiation not specified.

3. MEDICAL CASE RECORDS OF PATIENTS WITH CANCER OF THE SALIVARY GLAND

Of 542 patients with cancer of the parotid gland, the case histories of 48 patients (8.9 per cent.) do not indicate whether the right or the left gland is involved. Similarly, the case histories of 26 patients (49.1 per cent. of 53 cases) with malignancy of the submaxillary salivary gland are unsatisfactory in this aspect.

In a large group of 278 patients (46.6 per cent. of 597 cases of cancer of the major salivary gland) with mixed salivary gland tumour, the malignancy or otherwise

of the lesion is not specified. Actually, the number of patients with such lesions is more than this, and after carefully studying their case histories, 278 cases are included in the survey. Similarly, there are 19 patients (39.6 per cent. of 48 cases) with malignancy of the accessory salivary glands whose case histories are unsatisfactory in this regard.

In the group of 597 patients with cancer of the major salivary gland, the case histories of 139 patients (23.2 per cent.) simply record a diagnosis of carcinoma with no specification of histologic type. Presumably, the majority are malignancy of the salivary gland type.

Of 245 patients who received some form of radiotherapy (that is, those treated by surgery followed by post-irradiation therapy, and those treated by radiotherapy exclusively), 132 patients (53.9 per cent.) were given some type of X-ray irradiation not specified.

4. MEDICAL CASE RECORDS OF PATIENTS WITH CANCER OF THE FLOOR OF THE MOUTH

A diagnosis of carcinoma with no specification of histologic type is recorded in the case histories of 101 patients, or 30.7 per cent., of 329 cases, although squamous cell carcinoma is the predominant histologic type of tumour in this oral site.

Of 268 patients who had radiotherapy, 22 patients (8.2 per cent.) received some form of X-ray irradiation not specified. Also, the type of radiotherapy given to 11 patients (4.1 per cent.) is not specified.

5. MEDICAL RECORDS OF PATIENTS WITH GINGIVAL CANCER

Of 211 patients, the case histories of 73 of them (34.6 per cent.) do not specify whether the left side or the right side of the gingiva is involved by the disease.

In 58 patients (27.5 per cent. of 211 cases), a diagnosis of carcinoma with no specification of histologic type is recorded in the case histories. Presumably, most, if not all, of these are squamous cell carcinoma.

Eighteen patients (11.6 per cent.) received some form of X-ray irradiation/^{unspecified} in a group of 155 cases who had radiotherapy. Also, 11 patients (7.1 per cent.) had some form of radiotherapy not specified.

6. MEDICAL CASE RECORDS OF PATIENTS WITH CANCER OF THE BUCCAL MUCOSA OF THE CHEEK

In 32 patients (20.9 per cent. of 153 cases), the case histories do not indicate whether the right or the left cheek is involved by the disease.

A diagnosis of carcinoma with no specification of histologic type is recorded in the case histories of

28 patients (18.4 per cent. of 153 cases). Presumably, most of these are squamous cell carcinoma.

The case histories of 19 patients (16.1 per cent. of 118 cases who had radiotherapy) do not indicate specifically the type of X-ray irradiation given. Also, in 4 patients (3.4 per cent.) the form of radiotherapy given is not specified.

7. MEDICAL CASE RECORDS OF PATIENTS WITH PALATAL CANCER

Of 180 patients, there are 56 cases (31.1 per cent.) in which the case histories do not indicate whether the hard or the soft palate is involved by the disease.

There are 56 patients (31.1 per cent. of 180 cases) with a diagnosis of carcinoma with no specification of histologic type recorded in the case histories. Presumably, the majority are squamous cell carcinoma with quite a few cases of salivary gland type of tumours.

In the group of 121 patients who had radiotherapy, 16 (13.2 per cent.) received some form of X-ray irradiation not specified. Also 4 patients (3.2 per cent.) had some form of radiotherapy not specified.

These are the major deficiencies in the patients' case histories related to the type of information collected in this study. In the calculation of five year survival rates using the life table method,

if too many patients in a group are lost to observation following treatment, the ^{survival} rate obtained may not be satisfactory. In the present study, there is a considerable number of patients lost to observation following treatment, reflecting a poor follow-up system. This is particularly seen in patients who had surgery. Also, in the groups of patients with cancer of the lip and cancer of the salivary gland, the number of patients lost to observation at the end of five years following treatment is more than those with malignancy of the other intraoral sites.

SUMMARY

The present study of oral cancer morbidity in Australia is based on the examination of the case histories of patients with the disease seen in the major hospitals around Australia during a six year period from 1959-1964 inclusive. A total of 5,754 cases have been collected, comprising of 4,523 men and 1,231 women. This gives a rate of 14.1 per 100,000 population for male, 3.9 for female, and 9.1 for both sexes combined. There is a gradual and progressive decrease in the number of cases and the rates over the six years.

The number of cases for six years and the corresponding rates per 100,000 (in brackets) per year in the different states are as follows: Queensland 1,329 cases (14.5), South Australia 529 cases (9.1), Western Australia 562 cases (12.7), Tasmania 280 cases (13.3), and Northern Territory 7 cases (4.3). The high rates for Queensland, Tasmania, and Western Australia are undoubtedly influenced by the large number of lip cancer in those states, whereas the relatively low rate in New South Wales is the result of under reporting of lip cases by the author in the state.

When malignancy of the intraoral cavity proper

(I.C.N. 141, 143, and 144 - that is, excluding cancer of the lip and salivary gland) is considered, the number of cases and the rates (in brackets) in the different states are as follows: New South Wales 713 cases (2.9), Victoria 335 cases (2.0), Queensland 203 cases (2.2), South Australia 158 cases (2.7), Western Australia 137 cases (3.1), Tasmania 31 cases (1.5), and Northern Territory 2 cases (1.2).

and 191.0)
 Oral cancer (I.C.N.140-144/ is a disease of men, the male to female ratio is 3.7:1 in favour of men for Australia as a whole. For malignancy of the intraoral cavity proper (I.C.N.141, 143, and 144), the male to female ratio is 2.4:1. State variations in the sex distribution of the disease exist, although in all states there is a preponderance of males.

The average age of 4,478 men with oral cancer is 59.1 years (median age, 60.6 years), and that for 1,215 women is 62.6 years (median age, 64.8 years), whereas for male and female together this is 59.8 years (median age 61.4 years).

The most common site of oral cancer in Australia is the lip (62.1 per cent.), then the tongue (12.3 per cent.), salivary gland (10.5 per cent.), floor of the mouth (5.7 per cent.), gingiva (3.1 per cent.), palate (2.7 per cent.), and buccal mucosa of

the cheek (2.7 per cent.). If cancer of the intraoral cavity proper is considered, that is, excluding malignancy of the lip and the salivary gland, the tongue is the most frequent site (44.7 per cent.), followed by the floor of the mouth (20.8 per cent.), gingiva (13.4 per cent.), palate (11.4 per cent.) and buccal mucosa of the cheek (9.7 per cent.). The summary of malignancy of each of these specific oral sites will follow.

Mortality data of oral cancer in Australia is obtained from publications of the Commonwealth Bureau of Census and Statistics, Canberra. From 1959 to 1964 inclusive, 996 persons (665 men and 331 women) died from oral cancer. This gives a mortality rate of 2.1 per 100,000 population per year for male, 1.1 for female, and 1.6 for both sexes combined. The number of patients who died from the disease during this period in the different states and their corresponding mortality rate per 100,000 (in brackets) are as follows: New South Wales 401 deaths (1.7), Victoria 280 deaths (1.6), Queensland 141 deaths (1.5), South Australia 85 deaths (1.5), Western Australia 69 deaths (1.6), Tasmania 19 deaths (0.9), and Northern Territory 1 death (0.6).

Taking malignancy of specific oral sites into

consideration for the period 1959-1964, lip cancer is responsible for 83 deaths in Australia (M.R.*, 0.1), lingual malignancy 412 deaths (M.R., 0.7), cancer of the salivary gland 179 deaths (M.R., 0.3); malignancy of the floor of the mouth 120 deaths (M.R., 0.2), and cancer of other oral sites 202 deaths (M.R., 0.3).

The average age of 665 male patients who died from oral cancer is 68 years (median age, 69.2 years) and that for 331 female patients is 69.8 years (median age, 71.6 years), whereas for 996 total deaths, the average age of the patients is 68.6 years (median age, 69.9 years).

CANCER OF THE LIP IN AUSTRALIA

During the six year period from 1959 to 1964 inclusive, there are 3,090 men and 484 women with lip cancer seen in the major hospitals in Australia. This gives a rate of 9.7 per 100,000 for male, 1.6 for female, and 5.7 for both sexes combined. There appears to be a reduction in the number of cases, and also a decrease in the rate over the years.

Victoria has the most number of patients, 1,074 cases, and a rate of 6.0 per 100,000 population. The number of cases and the rates (in brackets) in the

* M.R., mortality rate per 100,000 population per year

other states are as follows: Queensland 1,030 (11.2), New South Wales 545 (2.2), Western Australia 396 (8.9), South Australia 306 (5.2), Tasmania 218 (10.4), and Northern Territory 5 (3.1). The small number of cases and the low rate in New South Wales is probably due to under reporting.

According to the Victorian Central Cancer Registry, lip cancer comprises about 3.2 per cent. of all human malignancy - this is based on the admission records of the ten major hospitals in the metropolis of Melbourne covered by the Registry. The lip is the most frequent site of oral cancer (I.C.N.140-144, and 191.0) in Australia, accounting for 62.1 per cent. of all mouth malignancy. The high incidence of lip cancer in Australia may be partly attributed to sunlight.

Cancer of the lip is a disease of men, the male to female ratio for Australian patients is 6.4:1. This is a much lower ratio when compared with the findings of others.^{65, 233, 302, 331, 400, 403} It is noteworthy that the male to female ratio for patients with upper lip cancer is 1:1 as compared to 9.9:1 in patients with lower lip malignancy.

Most of the patients in the present series are seen between the ages of 55 years and 75 years.

The average age of 3,065 male patients is 57.6 years (median age, 58.8 years) and that for 476 female patients is 63.9 years (median age, 66.1 years), whereas for male and female together, the average age is 58.5 years (median age, 60 years). Some investigators^{65, 403} report a comparable average age, while the findings of others³³¹ is lower.

The disease has a predilection for the lower lip, this site being involved at least eight times more frequently than the upper lip. It is interesting to note that in male, the lower lip is involved about fifteen times more often than the upper lip, whereas for female, the lower lip is involved only in about one and a half times more frequently. The findings of others^{233, 302, 331, 403} similarly indicate that the lower lip is more commonly involved by cancer than the upper lip.

Squamous cell carcinoma is the predominant histologic type of tumour seen on the lip, accounting for 88.1 per cent. of the disease as compared to 9.3 per cent. of basal cell carcinoma. However, when upper is considered separately, 73.4 per cent. of the disease in women are comprised of basal cell carcinoma, with only 25.5 per cent. of squamous cell carcinoma,

whereas in men, 56.3 per cent. are squamous cell carcinoma and 38.9 per cent. basal cell carcinoma. Considering the lower lip, for male, squamous cell carcinoma comprises 94.5 per cent. and basal cell carcinoma only 3.1 per cent., whereas for female, the percentages are 87 (SCC) and 9.6 (BCC). The large number of squamous cell carcinoma for lip as a whole is in accord with the findings of others², 331, 401

Radiotherapy appears to be used more frequently than surgery in the treatment of patients with primary lip cancer in the hospitals surveyed. Of 3,072 male patients who received treatment, 76.4 per cent. were treated radiologically, 22.8 per cent. surgically, and 0.8 per cent. by both methods. For 481 female patients, the choice of therapy is much the same - 72.3 per cent. received radiotherapy, 26 per cent. had surgery, and 1.7 per cent. had radiotherapy and surgery. Similar trends are seen in the treatment of patients with lower lip cancer and those with upper lip cancer, and patients with squamous cell carcinoma and those with basal cell carcinoma. Of the large group treated by radiotherapy, SXRT was used most frequently - 78 per cent. of 2,728 cases. For treatment of metastases, surgery is used to treat operable nodes, whereas patients with inoperable nodes

are treated palliatively with radiotherapy. Of 124 patients treated for cervical lymph node involvements, surgery was used in 79.8 per cent. of cases, and radiotherapy in 20.2 per cent. of cases.

The prognosis of patients with lip cancer is favourable, the crude cumulative five year survival rate for 3,065 male patients is 85.4 per cent. and that for 476 female patients is 85.6 per cent. The corresponding relative five year survival ratios (male 1.028, female 1.036) indicate that the five year survival rate for the two groups are much the same. There is virtually no difference in the five year survivals for patients with squamous cell carcinoma and those with basal cell carcinoma, and for patients treated by surgery and those treated radiologically.

CANCER OF THE TONGUE IN AUSTRALIA

There are 492 men and 214 women with malignancy^{of the tongue} seen in the major hospitals in Australia during the period 1959 to 1964 inclusive. The rates per 100,000 population for the two sexes are 1.5 and 0.7 respectively. For male and female combined, the rate is 1.1 per 100,000.

The number of cases registered in each state, and the corresponding rates per 100,000 population

(in brackets) are as follows: New South Wales 299 (1.2), Victoria 148 (0.8), Queensland 106 (1.2), South Australia 72 (1.2), Western Australia 65 (1.5), Tasmania 14 (0.7), and Northern Territory 2 (1.2). Except for Tasmania, in which male and female patients have the same rate, the rate for male is higher than that for female in all the other states.

According to the Victorian Central Cancer Registry, tongue cancer comprises about 0.5 per cent. of all human malignancies. The tongue is the second most frequent site of oral cancer (I.C.N. 140-144, and 191.0), accounting for about 12.3 per cent. of all oral malignancy in Australia. There are state differences and the comparatively high percentage for New South Wales is influenced by the low percentage of lip cancer in the state due to an under reporting of lip cases. If cancer of the tongue is related to malignancy of the intraoral cavity proper (I.C.N. 141, 143, and 144 - that is, excluding cancer of the lip and salivary gland), it accounts for 44.7 per cent. of all cancer of the oral cavity proper - in this instance, the tongue is the most frequent site of intraoral cancer.

Cancer of the tongue is about twice as common in men as in women, the male to female ratio is 2.3:1.

In most overseas studies,^{61, 95, 201, 244, 281, 365, 403} the male to female ratio is much higher in favour of men. It is interesting to note that for 137 patients with malignancy of the base of the tongue, this ratio is 5.2:1, whereas for 97 patients with cancer of the anterior two-thirds of the tongue, it is 1.6:1.

The average age for 479 male patients is 63.9 years (median age, 64.9 years) and that for 212 female patients is 66.4 years (median age, 67.9 years), whereas for male and female total, the average age is 64.7 years (median age, 65.6 years). The findings of other investigators indicate a lower average age^{3, 14, 95, 201, 361, 373} and a lower median age⁴⁰³ for patients with this disease. Most of the patients in the present study are between the age of 50 to 80 years - about 72 per cent. of 691 cases.

Unfortunately, the case histories of a large proportion of patients in the present series are unsatisfactory as to permit a specific allocation of site of the lesion on the tongue. Of 242 patients in the series of whom the case histories are satisfactory in this regard, 137 have their lesions sited on the posterior one-third of the tongue, and there are 97 patients with cancer involving the anterior

two-thirds of the tongue, with 8 cases having lesions on the base and anterior two-thirds of this organ.

The large majority of the lesions are squamous cell carcinoma. This is in accord with the findings of other investigators.^{96, 201, 281, 381}

Radiotherapy is used more frequently than surgery in the treatment of patients with primary lingual cancer in the hospitals surveyed. Of 457 male patients treated, 74.8 per cent. received radiotherapy, 16.2 per cent. had surgery, and 9.0 per cent. were treated by both methods combined. A similar trend is seen in the treatment of 206 female patients: 71.4 per cent. by radiotherapy, 20.9 per cent. by surgery, and 7.8 per cent. by a combination of both methods. The technique of implantation is popularly used, especially for anterior two-thirds lesion, and radon implant is the choice, with radium next, and then radioactive gold. DXRT, Cobalt 60, and MVT are the three other main modalities of radiotherapy used - these are all external beams, the choice of which is probably governed by availability of machines. In the treatment of metastases, surgery is in preference to radiotherapy - operable nodes are operated on, and inoperable cases are treated palliatively by radiotherapy. Of 202 patients treated for cervical lymph node metastases, 69.3 per cent. had

surgery and 30.7 per cent. received radiotherapy.

The prognosis of patients with tongue cancer is poor. The crude cumulative five year survival rate for 479 male patients is 24.9 per cent., and that for 212 female patients is 33.7 per cent. The corresponding relative five year survival ratios (male 0.324, and female 0.426) indicate a better five year survivals achieved by the female group. Patients with cancer of the posterior one-third of the tongue (relative five year survival ratio for 113 male patients is 0.172) have a poorer prognosis than those with malignancy involving the anterior two-thirds of the tongue (relative five year survival ratio for 60 male patients is 0.494). Although the group of patients treated by surgery appears to have a better five year survivals than the group receiving radiotherapy, no conclusions can be drawn concerning the efficacy of surgery in comparison to radiotherapy because of several factors involved which could influence the survival rate.

CANCER OF THE MAJOR SALIVARY GLAND IN AUSTRALIA

For the six year period from 1959 to 1964 inclusive, there are 330 men and 273 women with cancer of the major salivary gland registered in the main hospitals around Australia. This gives a rate of

about 1.0 per 100,000 population for male and for female, and for both the sexes together.

The number of patients seen in the different states during this period and the corresponding rates per 100,000 (in brackets) are as follows: New South Wales 227 (0.9), Victoria 155 (0.9), Queensland 96 (1.1), South Australia 65 (1.1), Western Australia 29 (0.7), and Tasmania 31 (1.5). Except for Tasmania, in which female has a higher rate, the rate for male in all the other states is just slightly higher than that for female.

Cancer of the salivary gland comprises about 10.5 per cent. of all oral malignancy (I.C.N. 140-144, and 191.0) in Australia and is the third most frequent form of mouth cancer. There are state differences, and the relatively high percentage for New South Wales is partly ascribed to a low percentage of lip cancer in the state due to under reporting.

Malignancy of the salivary gland affects both sexes with almost equal frequency, the male to female ratio of the present study is 1.2:1. This compares favourably with the findings of other investigators.

101, 332

The average age of 326 male patients is 55.2 years (median age, 56.4 years) and that for 271 female

patients is 53.6 years (median age, 55 years), whereas for male and female together, this is 54.7 years (median age, 55.7 years). Other investigators 217, 332 reported a comparable average age. When histologic type of the lesion is co-ordinated with age, patients with squamous cell carcinoma have a higher average and median age than those with salivary gland type of tumours. The largest number of patients seen in any single decade is to be found in the age group of 50-59 years.

The parotid gland is by far more frequently involved in cancer than the other two major paired salivary glands - 90.8 per cent. of 542 cases. Next in frequency of involvement is the submaxillary gland (8.9 per cent.), whereas the sublingual gland is very rarely involved (0.3 per cent.). Similar findings are reported by other investigators.^{33, 97, 163, 170, 283, 385} It appears that the right gland and the left gland are involved by cancer with equal regularity.

It is noteworthy that squamous cell carcinoma comprises only 8.4 per cent. of 597 cases of malignancy in these glands, the majority of the rest being tumours of various salivary gland types - malignant pleomorphic adenoma, adenoid cystic carcinoma, muco-epidermoid carcinoma, acinic cell adenocarcinoma,

adenocarcinoma, and unspecified mixed salivary gland tumours.

Surgery is the preferred treatment of choice in primary malignancy of the salivary gland. Of 585 patients treated, 59 per cent had surgery, 7.5 per cent. received radiotherapy, and 33.5 per cent. had surgery and radiotherapy. In the last group, usually adequate surgery is first given to the patients followed by post-irradiation therapy. In the treatment of metastases, surgery is also in preference to radiotherapy for mobile and operable nodes. Of 54 patients treated for lymph node involvements, 66.7 per cent. had surgery and 33.3 per cent. received radiotherapy.

The present study indicates that patients with this disease have a reasonable prognosis, but this is partly because of the inclusion of a fairly large group of patients with mixed salivary gland tumours in which the malignancy or otherwise of the lesions are not specified. The crude cumulative five year survival rate for 326 male patients is 74.8 per cent. and that for 271 female patients is 75.7 per cent. The corresponding relative five year survival ratios are 0.893 and 0.840 respectively, reflecting similar five year survivals for both sexes.

CANCER OF THE MINOR (ACCESSORY) SALIVARY GLAND IN
AUSTRALIA

Malignancy of the intraoral accessory salivary gland is not commonly encountered, only 48 cases are registered in the six years, representing 7.4 per cent. of cancer of all salivary glands.

There are 26 men and 22 women in the series, giving a male to female ratio of 1.2:1, which is comparable with that for patients with cancer of the major salivary gland.

The average age of the patients is 51.5 years (median age, 52 years). For male separately, the average age for 26 patients is 52.4 years (median age, 53.2 years), and for female, 51 years for 22 patients (median age, 51.4 years). Other investigators^{102, 333} reported more or less similar average age.

The accessory salivary glands of the palate are most frequently involved (60.4 per cent.), next are those of the lips (20.9 per cent.), then buccal mucosa of the cheek (12.4 per cent.), floor of the mouth (4.2 per cent.) and tongue (2.1 per cent.).

All the patients have salivary gland type of tumours, there being no other histopathologic types recorded.

Surgery is the main type of treatment used - 68.9 per cent. had this form of treatment, 11.1 per cent. received radiotherapy, and 20 per cent. had surgery and radiotherapy.

CANCER OF THE FLOOR OF THE MOUTH IN AUSTRALIA

Of the 329 patients with cancer of the floor of the mouth seen in the major hospitals around Australia from 1959 to 1964, there are 264 men and 65 women. The rate per 100,000 population is 0.8 for male, 0.2 for female, and 0.5 for male and female together.

New South Wales has by far the most number of patients, 160, and the rate per 100,000 is 0.7. For the other states, the number of cases and the rates (in brackets) are as follows: Victoria 72 (0.4), Queensland 32 (0.4), South Australia 35 (0.6), Western Australia 23 (0.5), and Tasmania 7 (0.3). In all states, there are more men than women with the disease.

According to the Victorian Central Cancer Registry, cancer of the floor of the mouth represents about 0.2 per cent. of all human malignancy. In the present study, malignancy of the floor of the mouth comprises about 5.7 per cent. of all oral cancer (I.C.N.140-144, and 191.0) in Australia and is the

fourth most common form of mouth cancer. There are state differences, and the high figure obtained for New South Wales is partly influenced by the low percentage of lip cancer in the state. If cancer of the floor of the mouth is related to malignancy of the intraoral cavity proper (I.C.N. 141, 143, and 144, that is, excluding cancer of the lip and salivary gland), it comprises 20.8 per cent. of all malignant neoplasms of the oral cavity proper, and is the second most frequent form of mouth cancer.

Cancer of the floor of the mouth is four times as common in men as in women in Australia. Other overseas studies^{10, 90, 135, 197, 204, 403, 407} indicate a much higher male to female ratio.

The average age of 261 male patients is 62.5 years (median age, 63.4 years) and that for 65 female patients is 66.8 years (median age, 66.3 years), whereas for male and female total, this is 63.9 years (median age, 63.8 years). The findings of other investigators vary, some indicate a comparable average age,¹³⁵ some slightly higher,¹⁰ and others lower.^{90, 360} Most of the patients in the present series are to be found between the age of 50 and 80 years - 80.7 per cent. of 326 cases.

Squamous cell carcinoma is the predominant

histopathological type of cancer seen in the floor of the mouth.

Radiotherapy is the main form of treatment used in the management of patients with primary cancer at this intraoral site in the hospitals surveyed. Of 317 patients treated, 74.8 per cent. received radiotherapy, 16.7 per cent. had surgery, and 8.5 per cent. were treated by a combination of both techniques. External beams popularly used are Cobalt 60, DXRT, and MVT. The technique of implantation has also been used frequently, and radon is the main source of implants - next is radium, and then permanent radioactive gold grains. Surgery is the treatment of choice for operable nodes and radiotherapy is used palliatively for inoperable metastatic nodes. Of 82 patients treated for secondary neck involvements, 63.4 per cent. had surgery and 36.6 per cent. received radiotherapy.

The prognosis of patients with this disease is poor. For 261 male patients, a crude cumulative five year survival rate of 31.3 per cent. was achieved, and for 65 female patients, this is 27.4 per cent. The relative five year survival ratio for male is 0.394 and that for female is 0.274, indicating a better five year survivals for the former sex.

CANCER OF THE GINGIVA IN AUSTRALIA

There are 141 men and 70 women with gingival malignancy registered in the main hospitals in Australia for a six year period from 1959 to 1964 inclusive. This gives a rate of 0.4 per 100,000 population for male and 0.2 for female, whereas for male and female combined, the rate is 0.3.

The number of cases and rates vary from state to state, with New South Wales having the largest number, 112 cases, and a rate of 0.5 per 100,000. For the other states, the number of patients and the corresponding rate (in brackets) are as follows: Victoria 40 (0.2), Queensland 17 (0.2), South Australia 19 (0.3), Western Australia 21 (0.5), and Tasmania 2 (0.1).

In Australia, cancer of the gingiva comprises about 3.7 per cent. of all oral cancer (I.C.N. 140-144, and 191.0), and is the fifth most common form of mouth cancer. This figure for the different states varies, and the relatively higher percentage obtained for New South Wales is undoubtedly partly due to a lower percentage of lip cancer in the state. When gingival cancer is related to malignancy of the intra-oral cavity proper (I.C.N. 141, 143, and 144 - that is, excluding cancer of the lip and salivary gland),

it comprises 13.4 per cent. of all intraoral cavity cancer - in this instance, it is the third most common form of oral malignancy.

In Australia, gingival cancer affects men twice more commonly than women. Some overseas studies^{89, 176, 198, 403} indicate a higher male to female ratio, while the findings of others^{143, 312, 323} show a male to female ratio similar to that of the present series.

The average age of 140 male patients is 64.8 years (median age, 64.6 years) and that for 68 female patients is 70.6 years (median age, 67.7 years), whereas for male and female together, this is 66.7 years (median age, 67.7 years). The findings of some investigators^{106, 198, 323} show a lower average age, while others^{89, 212, 312} report a similar average age to the present series. About 70 per cent. of the 208 patients in the present study are over 60 years of age and only about 2.4 per cent. are below 40 years old.

The lower gingiva is more frequently involved by cancer than the upper gingiva. Of the 211 cases, 79.6 per cent. of the patients have cancer of the lower gingiva as compared to 18.5 per cent. who have upper gingival malignancy. Similar findings are

noted by other investigators^{32, 143, 323, 360}. However, the findings of two studies^{198, 205} suggest that the upper and lower gingiva are involved with almost equal frequency. In the present study, for gingiva total, the right side and the left side are involved with equal regularity in the group of patients whose case histories allow such an allocation of specific site.

Squamous cell carcinoma constitutes the main, if not all, histopathologic type of tumours encountered in malignancy of the gingiva. This is in accord with the findings of others.^{156, 198, 212}

Of 136 male patients who received treatment for this disease, 62.5 per cent. were treated by radiotherapy, 23.5 per cent. by surgery, and 14 per cent. by both methods. A similar trend in the choice of therapy is seen for 66 female patients treated - 62.1 per cent. by radiotherapy, 25.8 per cent. by surgery, and 12.1 per cent. by both techniques combined. The main modalities of radiotherapy used were DXRT, MVT, and Cobalt 60. In the technique of implantation, radon, radium, and radioactive gold were used. Surgery is the treatment of choice for metastatic cervical nodes that are operable, while irradiation can be used palliatively for inoperable nodes. Of 65 patients treated for cervical lymph node involvement,

surgery was used in 73.8 per cent. of cases, and radiotherapy in 26.2 per cent. of cases.

The prognosis of patients with gingival cancer is poor. A crude cumulative five year survival rate of 25 per cent. is achieved by 140 male patients, whereas in the group of 68 female patients, this is 23.5 per cent. The relative five year survival ratio for male patients is 0.328 and that for female patients is 0.313, indicating that in both groups, the five year survivals are much the same. No comparison can be made between the prognosis of patients with cancer of the upper gingiva and those with lower gingival cancer, because the former group is too small to permit the calculation of an accurate survival rate.

CANCER OF THE BUCCAL MUCOSA OF THE CHEEK IN AUSTRALIA

During the period 1959 to 1964 inclusive, there are 95 men and 58 women with cancer of the buccal mucosa of the cheek seen in the major hospitals around Australia. There appears to be a gradual decrease in the number of patients over the six years. The rates per 100,000 population for male, female, and both sexes combined are about the same - 0.3, 0.2, and 0.2 respectively.

New South Wales has the largest number of

patients, 68 cases, and a rate of 0.3 per 100,000 population, followed by Victoria 31 cases (rate, 0.2), Queensland 23 cases (rate, 0.3), South Australia 21 cases (rate, 0.4), Western Australia 7 cases (rate, 0.2), and Tasmania 3 cases (rate, 0.1). Except for Tasmania, in all the other states, there are more men with the disease than women.

Cancer of the buccal mucosa of the cheek represents about 2.7 per cent. of all oral malignancy (I.C.N. 140-144, and 191.0) in Australia and is the least frequent form of mouth cancer. There are state variations, and the relatively higher figure for New South Wales is partly influenced by the lower percentage of lip cancer in the state due to under reporting. If cancer of the buccal mucosa of the cheek is related to malignancy of the intraoral cavity proper (I.C.N. 141, 143, and 144), it accounts for 9.7 per cent. of all malignant tumours of the mouth proper.

The male to female ratio of patients with this disease is 1.6:1 in favour of men. This is a much lower ratio when compared with the findings of other overseas investigators^{142, 144, 200, 403} for patients in Western countries. The studies of other investigators^{7, 92, 241} for patients with this disease in New Guinea and India indicate that although there

are still slightly more men than women in the series, the proportions of women are relatively higher.

The average age of 95 male patients is 68.1 years (median age, 69.2 years) and that for 58 female patients is 64.7 years (median age, 65.6 years), whereas for male and female total, this is 66.8 years (median age, 68.3 years). This is higher than the findings reported by other investigators.^{142, 144, 200 273}

In the present study, about 46 per cent. of the patients are seen between the age of 50 and 69 years.

Of 114 patients whose case histories indicate whether the left or the right cheek is involved, 44 per cent. had involvements of the right cheek and 45 per cent. had the lesions on the left cheek. When male and female are considered separately, for male, 38 patients had cancer of the left cheek and 32 patients had the lesions on the right cheek. For females, 31 patients had malignancy of the left cheek and 20 had the lesions sited on the right cheek.

Squamous cell carcinoma is the predominant histologic type of cancer seen in the buccal mucosa of the cheek - 77.1 per cent. of 153 cases. There are a few cases of malignancy of the salivary gland type (3.9 per cent.), and 18.4 per cent. with carcinoma unspecified.

Radiotherapy is used more frequently than surgery in the treatment of patients with this disease in the hospitals surveyed. Of 138 patients who received treatment, 73.9 per cent. were treated radiologically, 18.1 per cent. surgically, and 8.0 per cent. by a combination of both methods. External beams of Cobalt 60, DXRT, and MVT are popularly used. The technique of implantation has also been used quite frequently, and radon, radium, and radioactive gold are the common source of implants. In the treatment of metastases, the present series indicates that of a small group of 28 patients who were treated for secondary node involvement, 14 had surgery and 14 had radiotherapy. The consensus of opinion from literature review is that operable positive metastatic nodes are best treated by neck dissection.^{45, 112, 142, 144, 200}

According to the results of the present study, the prognosis of patients with cancer of the buccal mucosa is better than that for those with malignancy of the tongue, floor of the mouth, or gingiva. The crude cumulative five year survival rate for 95 male patients is 48.1 per cent. and that for 58 female patients is 42.3 per cent. The corresponding relative five year survival ratio for male is 0.679 and for

female 0.512, reflecting a better five year survivals for the former sex.

CANCER OF THE PALATE IN AUSTRALIA

Of 180 patients with cancer of the palate registered in the major hospitals in Australia from 1959 to 1964 inclusive, there are 113 men and 67 women. The corresponding rates per 100,000 population for male is 0.4, for female is 0.2, and for male and female total is 0.3.

The number of cases and the corresponding rates per 100,000 population (in brackets) in the different states are as follows: New South Wales 74 (0.3), Victoria 44 (0.3), Queensland 25 (0.3), South Australia 11 (0.2), Western Australia 21 (0.5), and Tasmania 5 (0.2).

Cancer of the palate in Australia comprises about 3.1 per cent. of all oral malignancy (I.C.N. 140-144, and 191.0) and is the sixth most common form of mouth cancer. The relatively higher figure obtained for New South Wales is partly influenced by a lower percentage of lip cancer in the state. If palatal cancer is related to malignancy of the intraoral cavity proper (I.C.N. 141, 143, 144), it represents 11.4 per cent. of intraoral cavity cancer - in this instance, it is the fourth most common type of mouth cancer.

The male to female ratio of 180 patients with palatal cancer is 1.6:1 in favour of men. It is interesting to note that for 55 patients with malignancy of the hard palate, this ratio is 1:1.5 in favour of women, whereas for 63 patients with cancer of the soft palate, this is 3.8:1 in favour of men. This is because most lesions of the soft palate are usually squamous cell carcinoma which is more commonly encountered in men, whereas tumours of the salivary gland type, more commonly encountered on the hard palate, are seen slightly more frequently in women. This is also the findings of other investigators.^{199, 234}

The average age of 112 male patients is 64.1 years (median age, 66.4 years) and that for 65 female patients is 63.9 years (median age, 65.7 years). For male and female total, the average age is 64 years (median age, 66.3 years). This corresponds closely to the findings of some investigators,^{106, 323} while others^{199, 360} indicate a lower average age. In the present study, the average age of patients with squamous cell carcinoma is higher than that for those with salivary gland type of malignancy, and this is in accord with the findings of others.^{199, 234} In the present series, the largest number of patients seen

in any one single decade is between the age group of 60 to 69 years - about 31 per cent. of 177 cases.

Of 124 patients whose case histories permit a specific allocation of site of the lesion, 55 had cancer of the hard palate, 63 had the lesions sited on the soft palate, and in 6 cases, both the hard and soft palate are involved. The findings of other investigators^{16, 32, 313} indicate that the hard palate is more frequently involved.

The present study indicates that squamous cell carcinoma comprises the major histologic type of tumours encountered in malignancy of the palate - 52.8 per cent. of 180 cases, whereas salivary gland type of tumours make up only about 16.1 per cent., the remaining 31.1 per cent. are carcinoma unspecified. The preponderance of squamous cell carcinoma is in accord with the findings of other investigators.^{32, 199, 234}

Patients with squamous cell carcinoma are treated mainly by radiotherapy - 70.8 per cent. of 89 cases, whereas 15.7 per cent. had surgery, and 13.5 per cent. had radiotherapy and surgery. Radiotherapy was used more often in patients with cancer of the soft palate. In the treatment of patients with salivary gland type of tumours, surgery was the

preferred treatment of choice - 77.8 per cent. of 27 cases, whereas 14.8 per cent. had radiotherapy, and 7.4 per cent. were treated by a combination of both methods. Surgery was used more often in patients with malignant involvement of the hard palate. The main modalities of radiotherapy used are implant and external beams such as DXRT, MVT, and Cobalt 60. In the technique of implantation, radon is commonly used, then radium, and radioactive gold. In the treatment of a small group of patients with cervical lymph node involvements, 80 per cent. had radiotherapy to the secondary, and in 20 per cent. surgery was used.

The crude cumulative five year survival rate of 112 male patients with palatal malignancy is 39.7 per cent. and that for 65 female patients is 61.1 per cent. The corresponding relative five year survival ratios are 0.515 and 0.747 for male and female respectively, indicating a better five year survivals for the latter sex. For 50 male patients with cancer of the soft palate, the crude cumulative five year survival rate is 36.9 per cent., and the survival ratio is 0.488. For 71 male patients with squamous cell carcinoma, the crude survival rate is 37.4 per cent. and the relative five year survival ratio, 0.448.

CONCLUSION

The present study of 5,754 patients with oral cancer seen in the major hospitals in Australia over a six year period from 1959 to 1964 inclusive shows that the tendency is for a decrease in the rate per 100,000 population of patients with the disease. Patients with oral cancer (International Classification Number 140-144, and 191.0) seen in the major hospitals in Australia have a rate of 9.1 per 100,000 population per year - for male this is 14.1 per 100,000, and for female 3.9 per 100,000. When cancer of the intraoral cavity proper (International Classification Number 141, 143, and 144 - that is, excluding malignancy of the lip and the salivary gland) is considered, the rate per 100,000 population is 3.4 for male, 1.5 for female, and 2.4 for male and female together.

Publications from the Commonwealth Bureau of Census and Statistics in Canberra indicate that during the period 1959 to 1964 inclusive, 996 persons in Australia died from oral cancer (I.C.N. 140-144). This gives a mortality rate of 1.6 per 100,000 population per year - male 2.1 per 100,000, female 1.1 per 100,000.

According to the Victorian Central Cancer Registry, of 30,837 patients with cancer reported to the Registry over a six year period (1959-1964), there

are 1,482 cases of oral malignancy (I.C.N.140-144, and 191.0), representing about 4.8 per cent. of all human cancers.

The present survey indicates that oral cancer is a disease of men; the male to female ratio for Australian patients is about 4:1. When cancer of the lip and the salivary gland is excluded, the male to female ratio of patients with intraoral malignancy is about 2.5:1.

Oral malignancy is a disease of the aged; the average age for 4,478 male patients is 59.1 and that for 1,215 female patients is 62.6 years, whereas for male and female together, this is 59.8 years. The peak incidence of the disease is seen in the age group of 60 to 69 years.

The lip is the most frequent site of oral cancer, accounting for 62 per cent. of 5,654 cases. This figure can be reasonably expected to be higher because a considerable proportion of patients with lip cancer are treated by private dermatologists, surgeons, radiologists, and in smaller hospitals with adequate surgical facilities not included in the survey. The high incidence of lip cancer in Australia is to be expected in a land with abundant sunshine most of the year round and whose people lead an active outdoor

life. The next most frequent site is the tongue (12.3 per cent.), then the salivary gland (10.5 per cent.), floor of the mouth (5.7 per cent.), gingiva (3.7 per cent.), palate (3.1 per cent.), and buccal mucosa of the cheek (2.7 per cent.).

With the exception of malignancy of the salivary gland, the predominant histopathologic type of cancer occurring in all oral sites is squamous cell carcinoma.

In general, radiotherapy is used more frequently than surgery in the treatment of patients with primary oral cancer in Australia, whereas surgery is the treatment of choice for patients with operable cervical lymph node metastases. Patients with lip cancer have a relatively favourable prognosis whereas those with lingual malignancy have the poorest prognosis.

The present study indicates that there is a need for a national central cancer registry in Australia, or the establishment of state cancer registries similar to the one in Victoria in all states, and that all cancer cases be reported to such a registry. This will greatly facilitate the studying of the disease so that reliable and accurate morbidity data may be obtained to give a true picture of the prevalence and incidence of the disease in the country.

The present survey also reveals certain deficient aspects of the medical case records of patients with oral cancer in some of the hospitals surveyed. There should be uniformity of reporting and detailed information of the case histories should be available. A considerable proportion of patients are lost to observation following treatment, reflecting poor follow-up systems. If too many patients are lost to observation, the calculation of accurate five year survival rate will not be satisfactory.

A review of the literature indicates that oral cancer in many South East Asian countries, particularly in India and Ceylon, is a much greater problem than in Australia. Although the true morbidity of this disease in South East Asian countries is not easily assessed because of the absence of cancer registries, there is no doubt that the incidence and prevalence of the disease in a great majority of these countries are higher than that in Australia.

The dentist definitely has a role to play in helping to prevent and control oral malignancy by removing suspected irritants in the mouth of patients and by being alert for any suspicious lesions in the oral cavity and referring the patients to a competent

specialist for further examination or treatment.

Specific diagnosis of oral malignancy must still be made on the basis of microscopic examination of tissue obtained by biopsy. In recent years, oral exfoliative cytology has been extensively promoted in the United States as an aid in the early detection of oral cancer. The technique is not meant to substitute biopsy and is not used as such.

The etiology of oral cancer is still not clearly understood. Numerous factors have been implicated but in many instances a clear-cut, direct, definite causation cannot be established. However, there are certain factors which definitely are directly associated with the disease. These include excessive exposure to sunlight in lip cancer of Caucasian people, reverse smoking in palatal malignancy of patients who practise this habit in certain parts of India, the Philippines, and the Panama, the use of snuff in gingival and buccal carcinoma of some patients in the southern part of the United States, and most probably betel nut chewing commonly seen in many Asian countries. Certain conditions which have been observed to give rise to malignant degeneration include leukoplakia, Plummer Vinson Syndrome, and oral submucous fibrosis among Indian patients.

At present, radiotherapy and surgery are the established methods of treatment in the management of patients with oral malignancy. Chemotherapy has recently come to the fore, but is still only being used on a palliative basis.

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APPENDIX I. SOURCES OF MATERIAL

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NEW SOUTH WALES

Royal Prince Alfred Hospital, Sydney

- Dr. E. F. Thomson, General Superintendent.
- Dr. D. Green, Head of Radiotherapy Department.
- Miss B. James, Medical Record Librarian, and staff, Radiotherapy Department.
- Staff of the General Medical Record Department.

St. Vincent's Hospital, Sydney

- Dr. M. Cleary, Medical Superintendent.
- Dr. L. Atkinson, Director of the Department of Radiotherapy and Tumour Clinic.
- Mrs. N. Mackenzie of the Tumour Clinic.
- Staff of the General Medical Record Department.

Sydney Hospital, Sydney

- Dr. N. Rose, Medical Superintendent.
- Dr. C.K. Hambley, Head of Radiotherapy Department.
- Staff of the Medical Record Department.

The Royal North Shore Hospital, Sydney

- Dr. I. R. Vanderfield, General Medical Superintendent.
- Dr. W. Woods, Head of Radiotherapy Department.
- Mrs. Harrington, Chief Medical Record Librarian and staff.

Prince of Wales Hospital, Sydney

- Mr. K. N. Wynne, Principal Scientific Officer, Research Laboratory, Cancer Research Unit.
- Miss J. Jarvis, Medical Record Librarian.

Mater Misericordiae General Hospital, Sydney

- Dr. H. M. Saxby, Medical Superintendent.
- Staff of Medical Record Section.

Royal Newcastle Hospital, Newcastle

- Dr. E. G. Currow, Medical Superintendent.
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Mater Misericordiae General Hospital, Waratah

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- Mr. M. A. MacGee, Oral Surgeon, Macquarie Street, Sydney.
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AUSTRALIAN CAPITAL TERRITORYCanberra Community Hospital, Canberra

- Dr. N. A. Elvin, Clinical Superintendent.

Other

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VICTORIAPeter MacCallum Clinic, Melbourne

- Dr. G. R. Kurrle, Medical Director.
- Dr. W. P. Holman, former Medical Director.
- Dr. C. C. J. Minty
- Mrs. G. Germann, Medical Records Officer, and staff.

St. Vincent's Hospital, Melbourne

- Dr. W. M. C. Keane, Medical Superintendent.
- Staff of the Medical Record Department.

Alfred Hospital, Melbourne

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- Dr. A. Rollo, Honorary Secretary,
Executive Committee.
- Staff of the Medical Record Department.

Prince Henry's Hospital

- Dr. L. C. Hudson, Medical Superintendent.
- Staff of the Medical Record Department.

The Royal Victorian Eye and Ear Hospital, Melbourne

- Dr. K. G. Howsam, Medical Director.
- Dr. G. M. Barty, Acting Medical Director.
- Staff of the Medical Record Department.

Royal Melbourne Hospital, Melbourne

- Dr. T. J. K. Jamieson, Medical Superintendent.

Austin Hospital, Melbourne

- Dr. F. J. O'Rourke, Medical Superintendent.

Royal Children's Hospital, Melbourne

- Dr. B. Neal, Honorary Secretary, Senior Medical Staff.

Others

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QUEENSLANDQueensland Radium Institute, Royal Brisbane Hospital, Brisbane

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- Dr. K. W. Mead, Deputy Director.
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- Dr. M. C. Moody, Neoplasm Registry.
- Staff of the Medical Record Department.

Queen Elizabeth Hospital, Adelaide

- through Dr. M. C. Moody and staff of the Medical Record Department.

Repatriation General Hospital, Adelaide

- Dr. T. P. Dearlove, Acting Medical Superintendent.

PERTHRoyal Perth Hospital, Perth

- Dr. A. Fortune, Medical Superintendent.

- Dr. A. J. M. Nelson, Head of Radiotherapy Department.
- Mr. J. H. Roden, Medical Records Officer, and staff.

Perth Radiological Clinic, Perth

- Dr. A. J. M. Nelson and staff.

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- Dr. P.D. Breidahl of the Anti-Cancer Council, Perth.
- Dr. H. McComb, Plastic Surgeon, Perth.

TASMANIA

Royal Hobart Hospital, Hobart

- Dr. G. M. Smith, Medical Superintendent.
- Staff of the Medical Record Department.

Peter MacCallum Clinic, Hobart

- Dr. J. H. Matar and staff.

Peter MacCallum Clinic, Launceston

- Dr. H. Holden and staff.

Other

- Mr. A. Stephenson, surgeon, Hobart.

NORTHERN TERRITORY

Darwin Hospital, Darwin

- through Dr. W. A. Langsford, Commonwealth Director of Health, Department of Health, Darwin.

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- Professor H. Syed Ali, Professor of Radiology and Superintendent, Radium Institute and Cancer Hospital, Hyderabad-Deccan, Andhra Pradesh, India.
- Dr. R. T. Salacup, Executive Secretary, Philippine Cancer Society Inc., 310 San Rafael, Manila, Philippines.
- Dr. T. M. P'eng, Deputy Director, National Defense Medical Center, Taipei, Tqiwan.
- Dr. R. J. Rose, Medical Statistician, Department of Health, Medical Statistics Branch, Ford Building, Te Aro, Wellington, C.2., New Zealand.
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- Dr. E. N. F. Browne, for Director of Medical and Health Services, Medical and Health Department, Tower Court, Hysan Avenue, Hong Kong.
- Dr. H. C. Ho, Senior Specialist (Radiology), Institute of Pathology, Queen Elizabeth Hospital, Kowloon, Hong Kong.
- Dr. K. Shanmugaratnam, Faculty of Medicine, University of Singapore, Singapore.

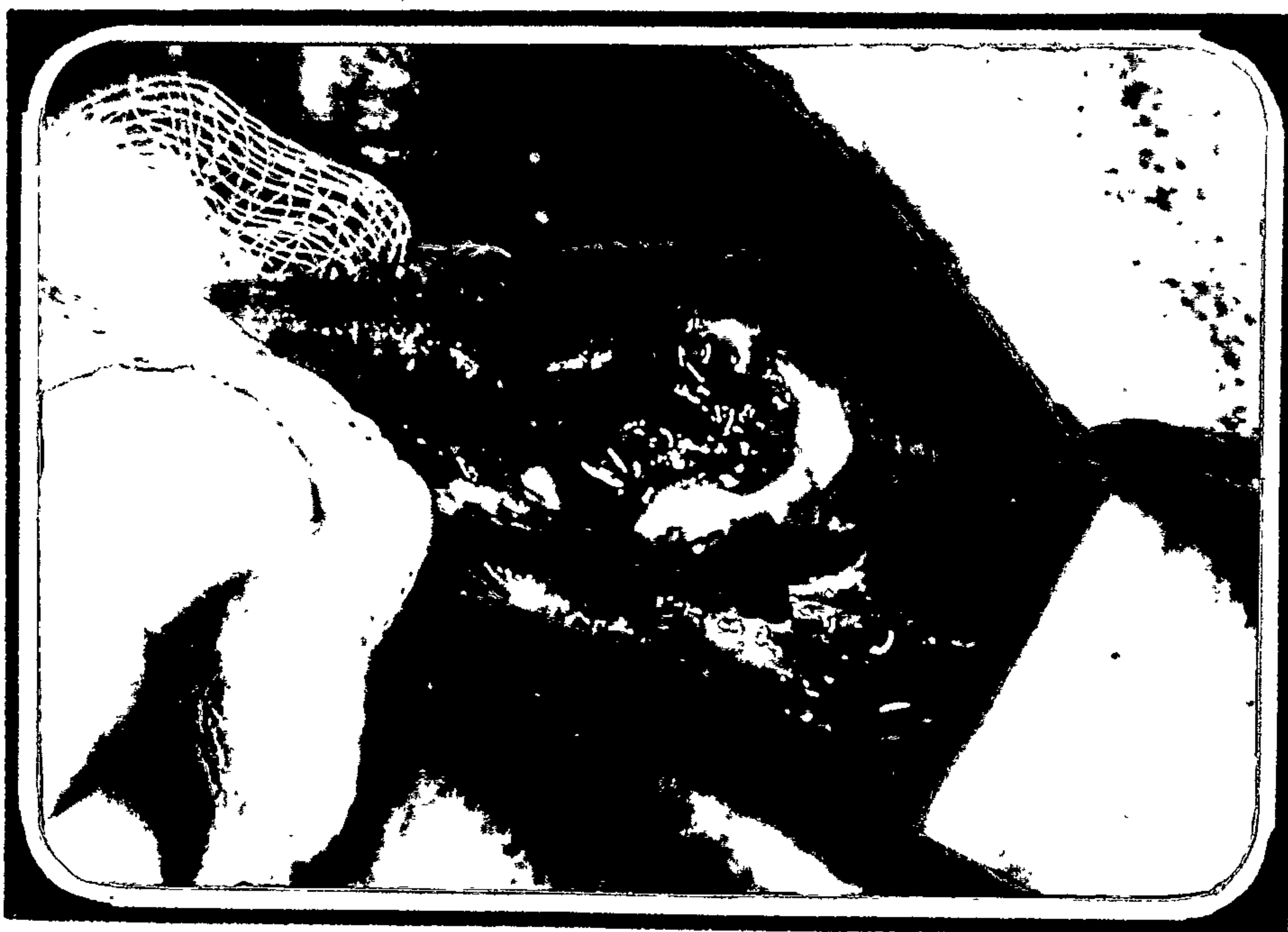
APPENDIX II. CLINICAL PHOTOGRAPHS OF
ORAL CANCER



CARCINOMA OF THE LOWER LIP



ADVANCED CARCINOMA OF THE LOWER LIP



CARCINOMA OF THE LATERAL BORDER OF THE TONGUE



CARCINOMA OF THE DORSAL SURFACE OF THE TONGUE



ADVANCED CARCINOMA OF THE LOWER GINGIVA



CARCINOMA OF THE UPPER GINGIVA EXTENDING
TO THE PALATE



CARCINOMA OF THE RIGHT UPPER GINGIVA
EXTENDING TO THE PALATE



CARCINOMA OF THE PALATE AND
TONSILLAR AREA



CARCINOMA OF THE LOWER RIDGE AND
FLOOR OF THE MOUTH



CARCINOMA OF THE FLOOR OF THE MOUTH



CARCINOMA OF THE LEFT BUCCAL MUCOSA
OF THE CHEEK



ADVANCED CARCINOMA OF THE RIGHT BUCCAL
MUCOSA OF THE CHEEK