



The clinicopathological study of oropharyngeal tumours

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Abstract:

In recent years increasing attention has been drawn in understanding the complete sketch of possibility of etiology, complication and treatment modalities of both benign and malignant tumours. Here in this study we have studied 243 oropharyngeal tumours in all aspects including incidence, age, sex, distribution, habits, etiology, precancerous lesions, symptoms, clinical features, pathology and diagnosis. This study helps for the complete understanding of awareness to limitations of complications of oropharyngeal tumours.

Key words: oropharyngeal tumours, etiology, pathology, diagnosis.

Introduction

The risk of developing cancer or dying from cancer varies widely in different parts of the world and in different population groups. Reasons for these variations are not fully understood, but may include habits social customs, diet, occupational exposure, climate, geography and difference in race and genetic factors [1]. India has the highest incidence of oral cancer in the world. The malignant neoplasms of the oral cavity, oropharynx and hypopharynx, together account for 45% of all cancers in India [2]. Most of the Asian countries in the world except, perhaps, Japan and Singapore. Even in a multiracial country like Malaysia where the population of Indian community only 11%, over 60% of oral cancers

occur in the Indian community of that country. The natural question could be asked as to why there is such high incidence of oral and oropharyngeal cancer in India or in people of Indian origin [3]. It has often been suggested that oral cancer has a multifactorial origin. It is true that smoking, spirit, spices, sharp teeth, syphilis, sepsis and Plummer Vinson syndrome contribute to oral cancer but among Indians, high incidence is due to habit of tobacco chewing in one form or the other [3]. Oral and oropharyngeal cancer is a treatable disease to certain extent in the sense that if it is a surface lesion visible to naked eye, within the reach of palpating fingers and is readily accessible to surgeon's knife. Still, less than 20% are seen in the early stage of the disease, vast majority

come with advanced stage. Direct bone involvement takes place early and is seen in nearly 2/3 of the cases [3]. Multicentricity of the tumors and field cancerization in the oral mucosa has been noted by several workers [4]. Oral and oropharyngeal cancer is one of the few cancers whose cause is known and it should be possible to prevent it. The real challenge in oral cancer lies in its prevention and early diagnosis [3]. Hence a clinicopathological study of oral and oropharyngeal tumors has been taken up.

Materials and Methods:

The material for present study consist of biopsy and surgical specimens from oral and oropharyngeal tumors received from Karnataka Institute of Medical Sciences Hospital, Hubli and other Government and private hospitals in twin cities and neighboring areas during the period of recent 7 years. During this seven period, 243 biopsies of oral and oropharyngeal tumors were received.

The pertinent history and clinical data of each case were obtained by personal interview with patient, from clinical case sheet and from hospital records. The same was analysed as per proforma.

The specimens consisted of wedge biopsies and excision biopsies. After studying the gross morphology, the bits of tissues were fixed in 10% neutral formalin for 24 hours and processed for paraffin blocks. Section 5 microns thick were cut using rotatory microtome and stained with haematoxylin and eosin. The special stains.

1. Periodic acid Schiff stain,
2. Van Gieson's stain,

3. Gomori's reticulin stain, were employed whenever required.

Processing and staining techniques are followed as per Armed Forces Institute of Pathology guidelines (1960).

The clinical and pathological features were analysed. These tumors were grouped according to WHO classification [5]. Histological grading of squamous cell carcinomas was done according to Broder's criteria's.

Results:

During the period of seven years, a total of 243 oral and oropharyngeal tumor biopsies were studied. Of these 42 were benign tumors and 201 were malignant tumors.

Oral and oropharyngeal tumors together in the present study formed 6.23% of all neoplasms, oral neoplasms formed 4.05% and oropharyngeal neoplasms formed 2.18% of all neoplasms in general (table 1.) the latter formed ratio of 1.86.1.

Table 1: Incidence of oral and oropharyngeal neoplasms

| Total No. of neoplasms | Oral neoplasms | Oropharyngeal neoplasms | Oral and oropharyngeal neoplasms |
|------------------------|----------------|-------------------------|----------------------------------|
| 3896 | 158 (4.05%) | 85 (2.18%) | 243 (6.23%) |

The frequency of malignant tumors in higher in both oral cavity and oropharynx than benign ones in respect to overall malignant and benign tumors in the body (table 2).

Table 2: Incidence of benign and malignant tumors of oral cavity and oropharynx

| Total Benign Tumors | Benign tumors of oral cavity and oropharynx | | | Total Malignant tumors | Total Malignant tumors | | |
|---------------------|---|------------|--------|------------------------|------------------------|------------|--------|
| | Oral cavity | Oropharynx | Total | | Oral cavity | Oropharynx | Total |
| 1530 | 38 | 04 | 42 | 2366 | 120 | 81 | 201 |
| (100%) | (2.5%) | (0.3%) | (2.8%) | (100%) | (5.1%) | (3.4%) | (8.5%) |

The subjective symptoms, for which patient sought medical treatment, were analysed (table 3). Patient with benign tumors presented with painless mass of fairly long duration (15days – 24 months) with majority of cases 12 months duration. Other less common symptoms were ulceration and difficulty in swallowing.

Patients with malignant tumors presented with symptoms of shorter duration ranging from 1 month to 12 months with maximum number of cases in 5 months duration. Majority of oral and oropharyngeal tumors presented with growth whereas majority of malignant oral and oropharyngeal tumors with nonhealing ulcer.

Nearly 48% of oral tumors presented with growth and 38% with ulcer. Smaller percentage presented with difficulty in swallowing/chewing and pain.

Nearly 38% of malignant oropharyngeal tumors presented with difficulty in swallowing/ chewing, followed by 22.5% with pain, 17.5% with mass in the neck and 12.5% with change in voice. Symptoms like change in voice, foreign body sensation, sore throat restricted to malignant oropharyngeal tumors (table 3).

Table 3: Distribution of various symptoms among cases with oral and oropharyngeal tumors

| Symptomatology | Oral Tumors | | | Oropharyngeal Tumors | | | Grand Total |
|---|-----------------------------|------------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------|-----------------------------|
| | Benign | Malignant | Total | Benign | Malignant | Total | |
| Growth | 29 (18.5%) | 46 (29.3%) | 75 (47.8%) | 1 (1.2%) | - | 1 (1.2%) | 76 (32.1%) |
| Ulcer | 2 (1.3%) | 57 (36.3%) | 59 (37.6%) | - | 1 (1.2%) | 1 (1.2%) | 60 (25.4%) |
| Difficulty in swallowing / chewing | 0 (1.6%) | 10 (6.4%) | 11 (7%) | - | 30 (37.5%) | 30 (37.5%) | 41 (5.9%) |
| Mass in the neck | - | - | - | - | 14 (17.5%) | 14 (17.5%) | 14 (5.9%) |
| Pain | - | 12 (7.6%) | 12 (7.6%) | - | 18 (22.5%) | 18 (22.5%) | 30 (12.7%) |
| Foreign body Sensation | - | - | - | - | 5 (6.2%) | 5 (6.2%) | 5 (2.1%) |
| Change in voice | - | - | - | - | 10 (12.5%) | 10 (12.5%) | 10 (4.2%) |
| Score throat | - | - | - | - | 1 (1.2%) | 1 (1.2%) | 1 (0.4%) |
| Total | 32 (20.4%) | 125 (79.6%) | 157 (100%) | 1 (1.2%) | 79 (98.8%) | 80 (100%) | 237 (100%) |

Spread:

Clinically information about metastasis was available in 131 cases of which 52% (68 cases) had suspicious of lymphnode metastasis (table 4). Among oropharyngeal tumors (71.8%) suspicious of metastasis were more than oral tumors (57.1%).

Fine needle aspiration cytology of cervical lymphnode was carried out of in 31 patients with oral and oropharyngeal cancers of which 28 (90.3%) showed evidence of metastasis of which oropharyngeal cancers leading (93.7%).

Table 4: Metastasis of malignant tumors of oral cavity and oropharynx

| | Oral Tumors | | | Oropharyngeal Tumors | | | Grand Total |
|--|-----------------------------|---------------------------|-----------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------|
| | Male | Female | Total | Male | Female | Total | |
| Clinically suspected metastasis | 31 (23.7%) | 9 (6.9%) | 40 (30.5%) | 27 (20.5%) | 1 (0.8%) | 28 (21.4%) | 68 (51.9%) |
| FNAC proved metastasis | 13 (9.9%) | - | 13 (9.9%) | 13 (9.9%) | - | 15 (11.4%) | 28 (21.4%) |
| Total | 44 (33.6%) | 9 (6.9%) | 53 (40.5%) | 42 (32.1%) | 1 (0.8%) | 43 (32.8%) | 96 (73.3%) |

Subsite Distribution:

Benign tumors were frequently seen in oral cavity with 38% in oral tongue followed by lip (35.7%) and buccal mucosa (11.9%).

Among oral and oropharyngeal malignant tumors tongue (35%) was the leading site, followed by buccal mucosa (25.4%), tonsil (9.4%), lip (9%) and vallecula (6%).

Malignant oral tumors were frequently seen in buccal mucosa (42.5%) followed by oral tongue (30%) and lip (15%). Malignant oropharyngeal tumors were frequently seen in base of the tongue (42%) followed by tonsil (23.5%) and vallecula (14.8%).

Both benign and malignant oral and oropharyngeal tumors were common in males for all subsite. Benign tumors in hard palate and tonsil were common in females, malignant tumors of base of tongue occurred only in males (table 5).

Table 5: Subsite distribution of oral oropharyngeal tumors in male and females

| Site | Benign Tumors | | | Malignant Tumors | | |
|-----------------------------|---------------|----------|-----------------|------------------|-----------|------------------|
| | Male | Female | Total | Male | Female | Total |
| Oral Tumors | | | | | | |
| Buccal mucosa | 4 | 1 | 5(11.9%) | 37 | 14 | 51(25.4%) |
| Oral tongue | 11 | 5 | 16(38.1%) | 27 | 9 | 36(17.9%) |
| Hard palate | - | 2 | 2 (4.8%) | 7 | - | 7 (3.5%) |
| Gingiva | - | - | - | 3 | - | 3(1.5%) |
| Lip | 10 | 5 | 15(35.7%) | 13 | 5 | 18(9%) |
| Floor of mouth | - | - | - | 4 | - | 4(2%) |
| Trigone | - | - | - | 1 | - | 1(0.5%) |
| Oropharyngeal Tumors | | | | | | |
| Tonsil | - | 1 | 1(2.4%) | 17 | 2 | 19(9.4%) |
| Soft palate | 1 | 1 | 2(4.8%) | 6 | - | 6(3%) |
| Base of tongue | 1 | - | 1 (2.4%) | 34 | - | 34(17%) |
| Tonsillar pillar | - | - | - | 5 | - | 5(2.5%) |
| Vallecula | - | - | - | 11 | 1 | 12(6%) |
| Pharyngeal wall | - | - | - | 4 | 1 | 5(2.5%) |
| Total | 27 | 5 | 42(100%) | 169 | 32 | 201(100%) |

Histological Typing:

Among the benign oral and oropharyngeal tumors hemangiomas formed 52.4% followed by squamous papillomas (33.3%) and pleomorphic adenomas (7.1%). Among the malignant oral and oropharyngeal tumors, squamous cell carcinoma formed 98.5% adenoidcystic carcinoma (1%) and nasopharyngeal carcinoma (0.5%). All malignant tumors in oral cavity were squamous cell carcinomas (table 6).

Table 6: Neoplasms of oral cavity and oropharynx

| | Oral Tumors | | Oropharyngeal Tumors | | Total | |
|----------------------|-------------|----|----------------------|-----|-------|------|
| | No. | % | No. | % | No. | % |
| Benign Tumors | | | | | | |
| Squamous papilloma | 13 | 31 | 1 | 2.4 | 14 | 33.3 |
| Haemangioma | 21 | 50 | 1 | 2.4 | 22 | 52.4 |
| Lymphangioma | - | - | 1 | 2.4 | 1 | 2.4 |

| | | | | | | |
|----------------------------------|------------|-------------|-----------|-------------|------------|-------------|
| Pleomorphic adenoma | 2 | 4.8 | 1 | 2.4 | 3 | 7.1 |
| Neurofibroma | 1 | 4.8 | - | - | 1 | 2.4 |
| Neurilemoma | 1 | 2.4 | - | - | 1 | 2.4 |
| Total | 1 | 2.4 | - | - | 1 | 2.4 |
| Malignant Tumors | | | | | | |
| Squamous cell carcinoma : | | | | | | |
| Carcinoma – in – situ | 6 | 3 | 3 | 1.5 | 9 | 4.5 |
| Grade I | 37 | 18.4 | 2 | 1 | 39 | 19.4 |
| Grade II | 63 | 31.3 | 47 | 23.4 | 110 | 54.7 |
| Grade III | 13 | 6.5 | 21 | 10.4 | 34 | 17 |
| Grade IV | 1 | 0.5 | 1 | 0.5 | 2 | 1 |
| Clear Cell Variant | - | | 4 | 2 | 4 | 2 |
| Adenoid Cystic carcinoma | - | | 2 | 1 | 2 | 1 |
| Nasopharyngeal carcinoma | - | | 1 | 0.5 | 1 | 0.5 |
| Total | 120 | 59.7 | 81 | 40.3 | 201 | 100 |

Haemangiomas were frequently seen in lip 45.4% (10 cases), followed by oral tongue 36.4% (8 cases) and buccal mucosa 13.6% (3 cases). Papillomas were commonly located in oral tongue 42.8% (6 cases) followed by lip 35.7% (5 cases). All the three pleomorphic adenomas were located in palate (two in hard palate and one in soft palate). Two neural tumors were located in oral tongue and one lymphangioma occurred in tonsil (table 7).

Table 7: Subsite distribution of benign tumors in oral cavity and oropharynx

| Sites | Haemangioma | Papilloma | Pleomorphic adenoma | Neurofibroma | Neurilemoma | Lymphangioma | Total |
|-----------------------------|--------------------|------------------|----------------------------|---------------------|--------------------|---------------------|---------------|
| Buccal Mucosa | 3 (13.6%) | 2 (14.3%) | - | - | - | - | 5 (11.9%) |
| Lip | 10 (45.4%) | 5 (35.7%) | - | - | - | - | 15 (35.7%) |
| Oral Tongue | 8 (36.4%) | 6 (42.8%) | - | 1 | 1 | - | 16 (38.1%) |
| Hard Palate | - | - | 2 (66.7%) | - | - | - | 2 (4.8%) |
| Gingiva | - | - | - | - | - | - | - |
| Floor of Mouth | - | - | - | - | - | - | - |
| Oropharyngeal Tumors | | | | | | | |
| Base of tongue | - | 1 (7.1%) | - | - | - | - | 1 (2.4%) |
| Soft Plate | 1 (4.5%) | - | 1 (33.3%) | - | - | - | 2 (4.8%) |
| Tonsil | - | - | - | - | - | 1 | 1 (2.4%) |
| Pharyngeal | - | - | - | - | - | - | - |

| | | | | | | | |
|-----------|---------------|---------------|--------------|-------------|-------------|-------------|--------------|
| wall | | | | | | | |
| Vallecula | - | - | - | -- | - | - | - |
| Total | 22 (52.4%) | 14 (33.3%) | 3 (33.3%) | 1 (2.4%) | 1 (2.4%) | 1 (2.4%) | 42 (100%) |

In the present study 198 squamous cell carcinomas were encountered (oral 120 cases and oropharyngeal 78 cases) of which 110 (55.5%) were grade – II, followed by 39(19.7%) grade – I, 34(17.2%) grade – III and only two cases were in grade IV. Clear cell variant of squamous cell carcinoma were 4 cases (2%) and carcinoma –in-situ 9 cases (4.5%) (table 9).

Incidence of high grade tumors was commonly seen in oral tongue and palate. Amongst oropharyngeal squamous cell carcinomas, higher grade tumors were increasingly seen in tonsil, base of tongue and vallecula in decreasing order (table 9).

Table 9: Subsite distribution of malignant tumors in oral cavity and oropharynx

| Site | Squamous Cell Carcinoma | | | | | | Total SCC | Nasopharyngeal carcinoma | Adenoid cystic carcinoma | Total |
|--------------------|-------------------------|---------------|---------------|---------------|-------------|--------------------|-----------|--------------------------|--------------------------|---------------|
| | Ca-in-situ | Grade I | Grade II | Grade III | Grade IV | Clear cell variant | | | | |
| Oral Cavity | | | | | | | | | | |
| Lip | 2 | 6 (37.5%) | 9 (56.3%) | 1 (6.2%) | - | - | 18 | - | - | 18 (9%) |
| Oral Tongue | 2 | 13 (38.2%) | 15 (44.1%) | 6 (17.6%) | - | - | 36 | - | - | 36 (17.9%) |
| Buccal Mucosa | 2 | 18 (36.7%) | 26 (53.1%) | 4 (8.2%) | 1 (2%) | - | 51 | - | - | 51 (25.4%) |
| Hard Palate | - | - | 6 (85.7%) | 1 (14.3%) | - | - | 7 | - | - | 7 (3.5%) |
| Gingiva | - | - | 3 (100%) | - | - | - | 3 | - | - | 3 (1.4%) |
| Floor of mouth | - | - | 3 (75%) | 1 (25%) | - | - | 4 | - | - | 4 (2%) |
| Trigone | - | - | 1 (100%) | - | - | - | 1 | - | - | 1 (0.5%) |
| Oropharynx | | | | | | | | | | |
| Base of tongue | 1 | 1(3.3%) | 18 (63.3%) | 10 (33.3%) | - | 2 | 33 | - | 1 | 34 (16.9%) |
| Tonsil | 1 | - | 9 (52.9%) | 7 (41.2%) | 1 (5.9%) | - | 18 | - | 1 | 19 (9.4%) |
| Tonsil Pillar | 1 | - | 4 (100%) | - | - | - | 5 | - | - | 5 (2.5%) |
| Soft Palate | - | - | 5 (83.3%) | 1 (16.7%) | - | - | 6 | - | - | 6 (3%) |
| Vallecula | - | 9 (9.1%) | 7 (63.6%) | 3 (27.3%) | - | 1 | 12 | - | - | 12 (6%) |
| Pharynx- | - | - | 3 | - | - | 1 | 4 | 1 | - | 5 |

| | | | | | | | | | | |
|-----------|-------------|---------------|----------------|---------------|-----------|-----------|---------------|---|---|---------------|
| geal wall | | | (100%) | | | | | | | (2.5%) |
| Total | 9 (4.5%) | 39 (19.7%) | 110 (55.6%) | 34 (17.2%) | 2 (1%) | 4 (1%) | 198 (100%) | 1 | 2 | 201 (100%) |

Tongue: Males are affected more frequently than female with ratio being 1.75:1. Capillary hemangioma was noted more (90.9%) frequently than cavernous type (9.1%). Infection and ulceration were noted in five cases producing features of granuloma pyogenicum.

Squamous pailloma: Second common benign tumor with 14 cases (33.3%) in this study. Age of patients ranging from 10 – 59 years with average age 38.7 years and higher incidence in 6th decade. Commonest sites for this tumor were tongue (50%) and lip (35.7%). This also shows male preponderance with male to female ratio being 3:7:1.

Plemorphic adenoma : Three patients of plemorphic adenoma were encountered (7.4%) in present study. Age ranges from 25-40 years. Two cases were encountered in hard palate and one case in soft palate. All the three cases were seen in female patients.

Lymphangioma: one patient of lymphangioma was encountered in this study in a rare site, tonsil. It presented with polypoidal growth arising from tonsil in a 8 year old girl.

Neural Tumors: One patient each with neurofibroma and neurilemoma were encountered in this study. Age of patients with neurofibroma and neurilemoma were 21 and 70 years respectively. Both were seen in adult males with mass in tongue. They were showing classical features of neurofibroma and neurilemoma.

Malignant Tumors :

In general oral cancer accounted for 59.7% and oropharyngeal cancer 40.3% of total malignances studied. Squamous cell carcinoma was the most frequently encountered malignant tumor in oral cavity and oropharynx. A total of 198 cases (98.5%) were studied of which 120 were in oral cavity and 78 in oropharynx. These tumors formed 8.3% of all malignant tumors in the body. Of the total 198 squamous cell carcinomas, 166 (83.8%) occurred in males and 32 (16.2%) in females, forming male to female ratio of 5:2:1. Males were commonly affected in all subsites.

Age & sex incidence of squamous cell carcinoma of the oral cavity and oropharynx. Although cases were noted from 20 to 80 years of age, with an average afe of 51 years, vast majority occurred between 5th and 7th decade. Commonest site being tongue (34.8%) and buccal mucosa (25.7%).

Of 120 oral squamous cell carcinoma patients 92 (76.7%) were males and 28 (23.4%) were females with ratio of 3:3:1. Age of these patients ranges from 20 to 80 years with average age of 50.5 years and highest incidence in 6th decade. Commonest sites for this tumor were buccal mucosa (42.5%) and oral tongue (30%).

Of 78 oropharyngeal squamous cell carcinoma patients. 74 (94.9%) were males 4 (5.1%) females with male to female ratio 18:5:1. Age of these patients ranges from 21 to 80 years with an average of 51.7 years and highest incidence in 5th decade. Commonest sites for this tumor were base of tongue (42.3%) and tonsil (24%).

Table 10: Distribution of squamous cell carcinoma by grade

| Squamous Cell carcinoma | Oral Cavity | | Oropharynx | | Total | |
|-------------------------|-------------|------|------------|------|-------|------|
| | No. | % | No. | % | No. | % |
| Grade – I | 37 | 32.5 | 2 | 2.8 | 39 | 21.1 |
| Grade – II | 63 | 55.3 | 47 | 66.2 | 110 | 59.5 |
| Grade – III | 13 | 11.4 | 21 | 29.6 | 34 | 18.4 |
| Grade – IV | 1 | 0.9 | 1 | 1.4 | 2 | 1.1 |
| Total | 114 | 100 | 71 | 100 | 185 | 100 |

The squamous cell carcinoma encountered in this study were divided according Broder's classification into grades I, II, III and IV. Grade –I constituted 21.1%, Grade – II 59.5%, Grade – III 18.4% and Grade – IV 1.1%.

Most of the squamous cell carcinomas in oral cavity were of Grade I & II while most of these in oropharynx were in Grade II & III suggesting that majority of these in oral cavity were well differentiated and those in oropharynx were moderately differentiated.

Among 198 squamous cell carcinoma studied, 160 showed (80.8%) inflammatory cellular infiltrate, composed of lymphocytes, plasma cells and eosinophils along with vascular proliferation. Forty six tumors (23.2%) showed infiltration into blood vessels, 11 tumors (5.5%) showed lymphatic invasion, 9 tumors (4.5%) showed perineural infiltration, 7 tumors (3.5%) showed muscular invasion and 5 tumors (2.5%) showed tumor giant cell.

Clear cell variant of squamous cell carcinoma formed 2% of all squamous cell carcinomas. All the tumors were encountered in oropharynx. These tumors showed sheets of cells with clear cytoplasm and hyperchromatic nuclei and lacking keratinisation with very few or absent mitotic figures.

Carcinoma-in-situ (fig. 11) constituted 4.5% (9 cases) of malignant tumors in these sites of which 66.7% (6 cases) encountered in oral cavity and 33.3% in oropharynx. Common site for this being tongue, buccal mucosa and lips. Age of patients ranged from 45 – 80 years with average age of 5-7 years and highest incidence 5th decade. It has female preponderance with female to male ratio 1.2:5:1.

Adenoid cystic carcinoma : Of the two cases of adenoid cystic carcinoma, one occurred in the base of the tongue and other in the tonsil. These tumors occurred in the minor salivary glands. Each occurred in 15 and 50 year male patients. One presented with difficulty in swallowing and other presented with metastasis in neck.

Nasopharyngeal Carcinoma : One case of nasopharyngeal carcinoma was encountered in this study, presented with metastasis in the cervical lymphnode, in an 18 year old male patient. The tumor was present in the nasopharynx and extending into the pharyngeal wall of the oropharynx.

Discussion:

Incidence of Malignant tumors:

Malignant tumors in the oral cavity and oropharynx constituted 82.7% of total tumors in these site and 8.5% of overall malignancies. Squamous cell carcinomas formed 98.5% of malignant tumors in these sites.

Most of the Asian countries have got much higher incidences of oral and oropharyngeal cancer than other countries in the world. The incidence of these tumors in India varies from 10.7% [6] to 35.9% [7]. In present study it is found to be (8.5%) slightly less than the lower limit.

Table 11: Comparative analysis of incidence of oral and oropharyngeal cancer to total cancer

| Place | Author | Year | % of oral and oropharyngeal cancer |
|--------------------------|----------------------------|------|------------------------------------|
| U.K. (country of London) | Khanolkar [7] | 1950 | 6.7 |
| Thailand | Piyasatan [8] | 1959 | 14.1 |
| Sauid Arabia | Taylor [9] | 1963 | 3 |
| U.S.A | Sharma[10] | 1964 | 7 |
| Phillipiness | Muir et al [11] | 1968 | 20.97 |
| Bombay (TMH) | Khanolkar [12] | 1950 | 35.9 |
| Vishakapatnam | Reddy et al [13] | 1971 | 10.7 |
| Greater Bombay | Jussawala & Deshpande [14] | 1971 | 22.2 |
| Karnataka | Bhargava [1] | 1973 | 16.2 |
| Present Study | - | 1997 | 8.5 |

Balsubramanyam et al [15] in their study of malignant oral and oropharyngeal tumors recorded pain as commonest symptom followed by ulcer / growth. Whereas in present study ulcer/growth was commonest symptom followed by difficulty in swallowing/ chewing and pain.

In the present study among patients with malignant oral tumors 82.4% presented with growth/ulcer, 9.7% with pain and 8% with difficulty in swallowing/chewing. Growth/ulcer were the commonest presentation in other studies (table 12).

Table 12: Comparative analysis of symptoms in oral cancers.

| Symptoms | Sharma et al[10] | Gopalkrishna et al[16] | Saxena and Agarwal[17] | Present study 1997 |
|----------------------------------|------------------|------------------------|------------------------|--------------------|
| Ulcer /Growth | 88.5% | 93.8% | 93.2% | 82.4% |
| Difficulty in swallowing/chewing | 13.9% | - | - | 8% |
| Mass in the neck | 63.9% | 30.9% | 31.4% | - |
| Pain | 63.5% | 88.7% | 86.7% | 9.6% |
| Change of Voice | - | 6.2% | - | - |
| Salivation | 46.7% | 17.5% | 3.1% | - |

Anderson et al [24] in study of oropharyngeal malignancies found that dysphagia and mass in the neck were commonest symptoms whereas in present study dysphagia was followed by pain and then mass in the neck (table 13).

Table 13: Comparative analysis of symptoms of oropharyngeal cancers.

| Symptoms | Anderson et al [18] | Present study |
|------------------------|---------------------|---------------|
| Dysphagia | 58% | 38% |
| Mass in neck | 28% | 17.7% |
| Pain | 11% | 22.8% |
| Foreign body sensation | - | 12.6% |
| Others | 26% | 8.3% |

Subsite distribution of oral and oropharyngeal cancers :

The distribution of oral and oropharyngeal cancers in different parts of India were variable. Buccal mucosa was noted to be commonest site of cancer in south India (Madras 70.9%, Agra 57.9%, Kurnool 56.4%, Guntur 46.6%), whereas tongue was commonest in Bombay (44.3%), Palate in Vishakapatnam (47.0%) and tonsil (31.3%) in Assam [1]. While in the present study tongue (34.8%) being the commonest site followed by buccal mucosa (25.4%) (table 14).

Table 14: Comparative analysis of oral and oropharyngeal cancers in India (in percent) [1]

| Site | Agra | Assam | Bombay | Guntur | Kurnool | Madras | Vishakapatnam | Present Study |
|---------------|------|-------|--------|--------|---------|--------|---------------|---------------|
| Tongue | 31.4 | 25.3 | 44.3 | 22.9 | 12.6 | 22.3 | 17.1 | 34.8 |
| Buccal Mucosa | 57.9 | 15.2 | 24.8 | 46.6 | 56.4 | 70.9 | 23 | 25.4 |
| Palate | 5.7 | 6.6 | 7.5 | 15.4 | 4.1 | 5.8 | 4.7 | 6.5 |
| Lip | 3.6 | 5.6 | 1.4 | 8 | 5.6 | 1 | 5 | 8.9 |
| Tonsil | 1.3 | 31.3 | 15.4 | 4 | 5.8 | - | 8 | 11.9 |
| Pharynx | - | 16 | 6.5 | 4 | 15.8 | - | - | 8.4* |
| Others | - | - | - | - | - | - | - | 4 |

* Including vallecula and post pharyngeal wall.

Of 201 malignant tumors in the present study, 120 occurred in the oral cavity and 81 in the oropharynx. The comparative analysis of distribution of malignant tumors in the oral cavity and oropharynx were shown in table 15 and 16.

It was noted that lip, tongue and floor of the mouth were common subsites of oral cancer in other countries, where as buccal mucosa, tongue and gingiva were common sites of cancer in various studies in India including the present study where lip cancer was in third place instead of gingiva (table 15).

Table 15: Comparative analysis of subsite distribution of oral cancer (in present)

| Site | Lederman et al[19] | Krolls & Hoffman et al[20] | Alvi et al [21] | Paymaster et al[2] | Sharma et al [10] | Saxena & Agarwal[17] | Gopalkrishna et al [16] | Present Study |
|-----------------|--------------------|----------------------------|-----------------|--------------------|-------------------|----------------------|-------------------------|---------------|
| Lip | 44.1 | 23 | 10.4 | 3.5 | 5.7 | 3.3 | 7.2 | 15 |
| Tongue | 23.1 | 24 | 30.1 | 26.5 | 36.9 | 28.9 | 24.7 | 30.3 |
| Floor of Mounth | 18.4 | 26 | 27.6 | 4.7 | 0.9 | - | 2.1 | 3.3 |
| Buccal Mucosa | 1.8 | 12 | 12 | 46 | 48.4 | 56.8 | 51.5 | 42.5 |
| Palate | 5.8 | 4 | 3.2 | 7.5 | 2.4 | 4.3 | 5.2 | 5.8 |
| Gingiva | 6.8 | 11 | 16.7 | 11.8 | 5.7 | 6.7 | 9.3 | 2.5 |
| Trigone | - | - | - | - | - | - | - | 0.8 |

Base of the tongue was commonest site followed by tonsil in oropharyngeal cancers from studies in India and abroad including present study. Cachin et al [28] and Weller et al [29] have observed tonsil to be the commonest site followed by base of tongue and Fletcher et al [30] reported base of the tongue and pharyngeal wall were commonest sites (table 16).

Table 16: Comparative analysis of subsite distribution of oropharyngeal cancer (in percent).

| Site | Lederman et al[19] | Cachin et al [22] | Fletcher et al [23] | Waller et al [24] | Paymaster et al [2] | Present Study |
|------------------|--------------------|-------------------|---------------------|-------------------|---------------------|---------------|
| Tonsil | 22 | 58 | 17 | 46 | 25 | 29.6 |
| Base of Tongue | 41 | 15 | 24 | 34 | 56 | 42 |
| Soft Palate | 10 | 6 | 10 | 10 | 8 | 7.4 |
| Pharynge at wall | 10 | - | 24 | 10 | - | 6.2 |
| Other sites | 13 | 21 | 24 | - | 11 | 14.8* |

* Vallecula

Squamous Cell Carcinoma :

A total of 189 squamous cell carcinomas were encountered in the present study including 93.4% of Grade – I to Grade – IV and 2 % of clear cell variant. Carcinoma-in-situ formed 4.5%.

In the present study nearly 80% of squamous cell carcinomas in oral cavity and oropharynx, were well differentiated (Grade – I and II) where as Balasubramanyam et al [15] observed more than 60% of these were well differentiated (table 17).

Table 17: Comparative analysis of grades of squamous cell carcinomas in oral cavity and oropharynx.

| Grades | Balasubramanyam et al[15] | Present study |
|----------|---------------------------|---------------|
| I | 23.1% | 21.1% |
| II | 37.4% | 59.5% |
| III | 23% | 18.4% |
| IV | 13% | 1.1% |
| Variable | 3.4% | - |

Tongue was the commonest site for squamous cell carcinoma (34.8%). When grading of these tumors was analysed, 78% of cases in the present study and nearly 70% of cases in study by Balasubramanyam et al [15] belonged to grade II and III. So most of the carcinomas of the tongue of the tongue were moderately differentiated (table 18).

Table 18: Comparative analysis of distribution of grades of squamous cell carcinoma in tongue.

| Grades | Balasubramanyam et al [15] | Present study |
|----------|----------------------------|---------------|
| I | 10.8% | 21.9% |
| II | 23.3% | 53.1% |
| III | 36.9% | 25% |
| IV | 13.8% | - |
| Variable | 6.2% | - |

Buccal mucosa was the commonest site for squamous cell carcinoma in oral cavity (42.5%) and they formed 25.7% of all squamous cell carcinoma of oral cavity and oropharynx in present study. Amongst these 86% in present study and 91% in the study by Martin and Pflueger [25] belonged to grade I and II, indicating squamous cell carcinomas of buccal mucosa were well differentiated (table 19).

Table 19: Comparative analysis of distribution of grades of squamous cell carcinomas in buccal mucosa.

| Grades | Martin and Pflueger [25] | Present study |
|--------|--------------------------|---------------|
| I | 38.4 | 36.7 |
| II | 53.5 | 53.1 |
| III | 3 | 8.2 |
| IV | - | 2 |

Similarly most of squamous cell carcinomas in the lip were well differentiated both in present study and that of Balasubramanyam et al [15] (table 20).

Table 20: Comparative analysis of distribution of grades of squamous cell carcinoma in lip.

| Grades | Balasubramanyam et al [15] | Present study |
|----------|----------------------------|---------------|
| I | 30.4 | 37.5 |
| II | 52.2 | 56.5 |
| III | 13.1 | 6.2 |
| IV | - | - |
| Variable | 4.3 | - |

Other malignancies encountered in present study were adenoid cystic carcinoma (2 cases) of minor salivary glands and one case of nasopharyngeal carcinoma extending to posterior pharyngeal wall from nasopharynx, all were in oropharynx.

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