

# 1. A LESION WITH SERIOUS OUTCOME

## ORAL CANCER

### *Introduction*

The term “oral cancer” is used to describe any malignancy that arises from the oral tissues. Squamous cell carcinoma is the most common, representing 90-95% of all oral malignancies. The term oral cancer is therefore used to imply squamous cell carcinoma. In the *International Classification of Diseases (9<sup>th</sup> Revision)*, WHO, oral cancer is classified under the rubrics 140 (lip), 141 (tongue), 143 (gingive), 144 (floor of the mouth), and 145 (other parts of the mouth).

Globally, oral cancer is one of the 10 most common cancers. It is a major health problem in India, forming about 10% of the estimated 644,600 new cancers that occur in all parts of the body each year. On the basis of annual age adjusted incidence rates, oral cancer ranks from 1<sup>st</sup> to 6<sup>th</sup> among all cancers in different regions of India. The total number of cancers at any given time, however is about 2.5 to 3-times the number (644,600) estimated from the incidence rates. Correspondingly, the number of oral cancers at any given time would be higher than 10% because of different survival rates of various cancers. Even if two types of cancers have same incidence rate, at any given point in time, the one with higher survival rate will be found more often than the one with lower survival rate.

Generally, oral cancer occurs more commonly among men than women depending upon the extent and the type of tobacco habits prevalent among them. The highest number of oral cancer in both sexes occur in the 6<sup>th</sup> decade of life. A number of etiologic and risk factors have been mentioned for this diseases in standard text books. Among these factors, there is conclusive epidemiologic evidence that tobacco use is causally associated with oral cancer. According to the WHO, about 90% of oral cancer in South – east Asia is attributable to tobacco use.

Oral cancer, due to its location in an accessible part of the body, i.e. mouth, can be detected at an early stage. However, because of a lack of symptoms, especially pain, in the early stages, medical attention is not sought till the disease is advanced. This leads to a poor prognosis. It is therefore, important for all oral health professional to equip themselves with the knowledge with the knowledge to detect this disease at the earliest possible stage.

### *Clinical aspects*

Oral cancer has a varied clinical appearance. Most of the lesions can be

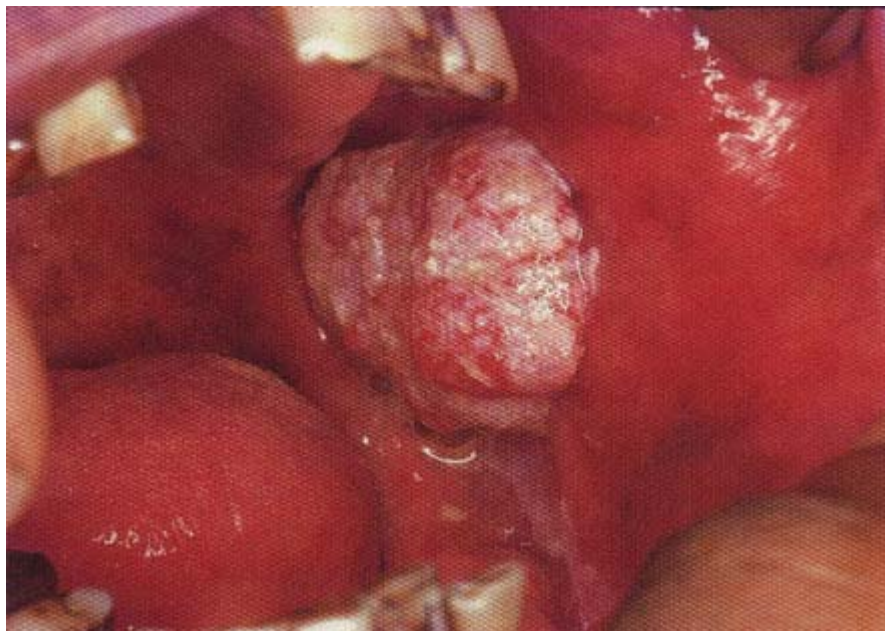


Fig. 1. An exophytic cancer marked by a nodular surface with white patches in the left buccal mucosa of a 57-year old female betel –quid (*pan*) (see Appendix I) chewer, This tumor is fixed to the deeper tissues and therefore not freely mobile.

Described as exophytic, ulcerative/infiltrative, and verrucous carcinomas. Such a distinction also serves as a prognostic marker for this disease.

**Exophytic cancer:** The term “exophytic” is used to describe an outwardly growing tumor (Fig. 1.) Fixation of the tumor, due to its spread into the underlying tissues is one of

Fig. 2. An ulcerative cancer in the left buccal mucosa of a 45-year old male tobacco-lime (*Khaini*) user (see Appendix I) from Maharashtra. Note a leukoplakia anteriorly.



the clinical sign of malignancy. Exophytic cancers metastasize less frequently than the ulcerative type.

**Ulcerative cancer:** In contrast to exophytic lesions, ulcerative cancers burrow deep into the mucosa with a breach in the surface (Fig. 2). Sometimes the ulceration may have a deceptively innocuous appearance. Rolled borders (everted margins) and induration on a palpation, however, are indicative of a hard tumor mass deep within the tissue. A wide spectrum of noncancerous oral lesions are also characterized by ulceration; any ulceration in the mouth not attributable to a recognized causal factor and does not heal within four weeks, especially in tobacco users, must be investigated for its malignant potential. Ulcerative cancers metastasize more frequently than cancers.

**Verrucous carcinoma:** Verrucous carcinoma is a distinct clinico-pathological variant of squamous cell carcinoma. The term “verrucous” is used because of its fine, finger-like surface projections. Verrucous carcinoma represents up to 20% of all oral carcinomas. The characteristic behavior of this carcinoma is its slow growth and the rarity with which it metastasizes to the regional lymph nodes. Correspondingly, it has an excellent prognosis. Verrucous carcinoma is often large at diagnosis (Fig. 3.)

The surface of a verrucous carcinoma may occasionally be devoid of verrucous projections, or the lesion may appear like a thick white patch. Upon close examination, numerous white hair-like projections can be discerned in the white patch (Fig. 4). Microscopically, verrucous carcinoma



Fig. 3. A broad based and a large verrucous carcinoma in the left buccal mucosa of a 65-year old male betel-quinid chewer who also smoked.

Fig. 4. A verrucous carcinoma appearing like a white patch in the right buccal mucosa of a 48-year old male betel-quin chewer.



demonstrates keratinization on the surface. The epithelium proliferates in the form of bulbous rete pegs that project uniformly into the connective tissue rather than be deeply invasive into the stroma. It also demonstrates only minimal atypical changes. Because of the lack of invasiveness and presence of minimal atypical feature, the histologic diagnosis, especially from small biopsies. An incisional biopsy that includes the normal mucosa adjacent to the tumor mass will help the histopathologist in establishing the diagnosis.

#### ***Oral cancer at different intraoral locations***

Oral cancers shows marked variations in the involvement of intraoral site in different geographic areas. Such a variation is

attributed to the type of tobacco habits (see Appendix I) practiced by the affected individual and on other contributory factors, such as sunlight and alcohol. The exception perhaps is presence of submucous fibrosis, in which cancer may develop in any intraoral location (see section 2.5). As treatment planning and the prognosis of oral cancer varies according to specific intraoral locations, it is essential to record the exact location of cancer according to well-defined boundaries of the oral mucosa (see Appendix II).

**Cancer of the vermilion border:** In an analysis of 1,800 oral cancer among men and 856 among women recorded in nine Indian cancer registries reported in 1992, 3% men [range 0-6%] and 4% women [range 0-13%] overall had lip cancers that include

vermilion border, i.e., lipstick area, and the labial mucosa. Cancer primarily arising from the vermilion border is rare among Indians and other dark skinned races perhaps due to the protective action of melanin against UV light. In contrast, in some western countries, for instance, in parts of Canada, USA, and Australia, vermilion border cancer. In these countries it is found to occur among individuals with ruddy complexion who are engaged in outdoor activities that result in their greater exposure to sunlight. Tobacco use, especially smoking, is recognized as an etiologic factor in fair skinned persons. The common initial signs and symptoms of cancer in this location include ulceration, encrustation, soreness, or a growth. Vermilion border cancer occur more frequently in the lower lip and are

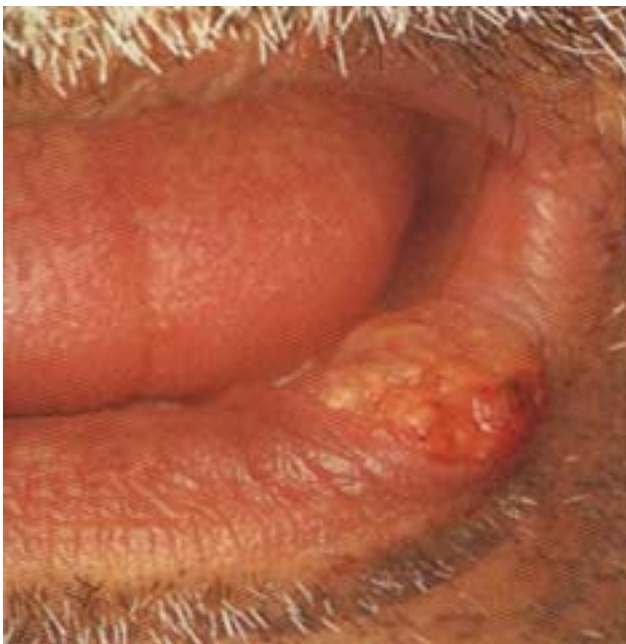


Fig.5. A small growth in the vermilion border of a 67-year old Indian male who chewed betel quid and smoked *bidis* (see Appendix I).



Fig. 6. Cancer of the lower labial mucosa appearing like a thick nodular leukoplakia in a 45-year old male *Khaini* user. Note the fissured surface with extension of the lesion towards the mucocutaneous junction.

usually small (Fig. 5) and slow growing. Metastasis to the regional lymph nodes is infrequent (2-20%); consequently, the prognosis is good.

**Cancer of the lower labial mucosa:** Among *khaini* users in some northern Indian states like Uttar Pradesh and Bihar, labial mucosa is more frequently affected than other intraoral locations. This is because *khaini* which is a mixture of tobacco and slaked lime, is often placed in the lower labial groove and held against the labial mucosa. In areas where this habit is widespread, 3-18% of the oral cancers were observed in the labial mucosa. Sometimes cancer in this location appears like a thick nodular leukoplakia (Fig. 6).



Fig. 7. A large tumor in the lower labial mucosa of a 50-year old male *khaini* user from Maharashtra. Note the extension on to the buccal mucosa. The submandibular lymph nodes were affected.

Most of the advanced lesions in the labial mucosa tend to be ulcerative. Occasionally, however, the lesion may be exophytic and

large (Fig. 7). Lymph node involvement is high (65%) for such cancers.

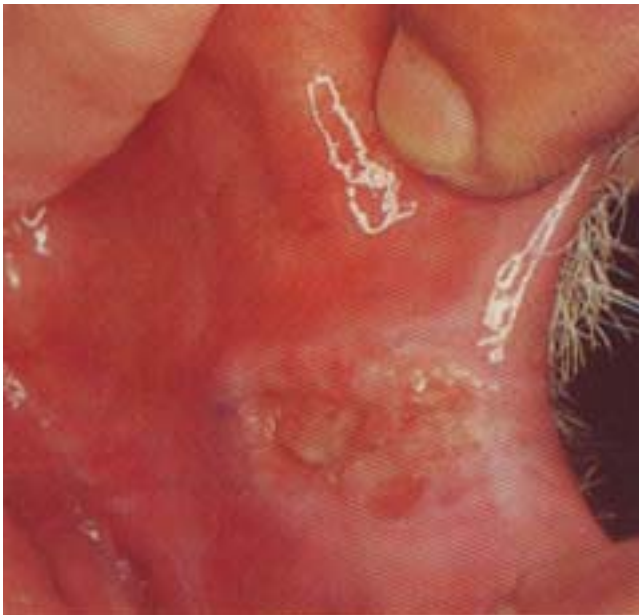


Fig. 8. An ulcerative cancer in the left commissure of a 62-year old male *bidi* smoker. Note the everted margins.

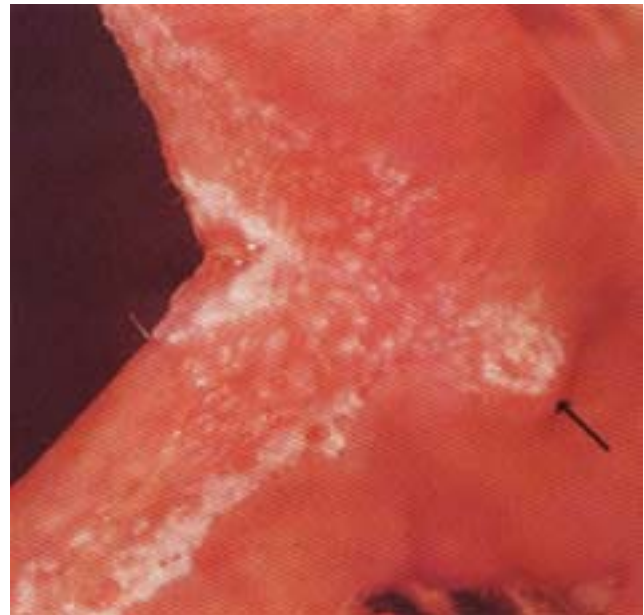


Fig. 9. Labial commissural cancer appearing like a nodular leukoplakia in the right commissure of a 65-year old male *bidi* smoker. Note an exophytic area of about 5 mm (arrow). A biopsy from this area revealed a well differentiated squamous cell carcinoma.

**Cancer of the labial commissure:** Labial commissure is a common location of a cancer among *bidi* smokers. Cancers in this location may be ulcerative (Fig. 9). Commissural cancers are relatively easy to treat and the prognosis is excellent.

Labial commissural cancers are often classified together with buccal mucosal cancers, but they should be separated as the former have a better prognosis. Occasionally, cancer in this location may appear like a nodular leukoplakia (Fig. 9). If a nodular leukoplakia is thick or shows even a small growth or indurated areas, it should raise suspicion of malignancy, and such areas must be biopsied.



Fig. 10. Cancer in the posterior aspect of the buccal mucosa and the mandibular groove of a 60-year old female at the site of placement of the betel quid.

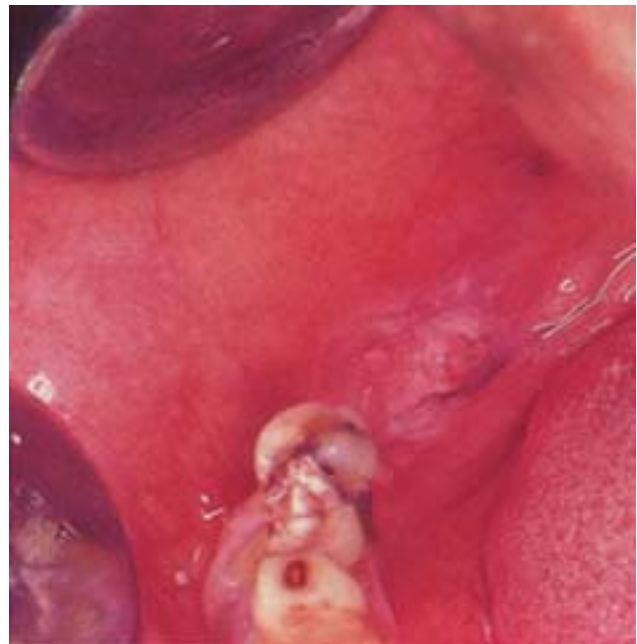


Fig. 11. A small exophytic asymptomatic cancer (2 cm) in the posterior part of the right buccal mucosa and the mandibular groove of a 52-year old female who chewed tobacco. The duration of the lesion at diagnosis was less than six months.

**Cancer of the posterior part of the buccal mucosa and the groove:** In areas where betel-quid chewing is widespread, up to 80% of oral cancer occur in the buccal mucosa. Cancer can arise from any part of buccal mucosa, probably depending upon the individual method of chewing and smoking and the placement of tobacco containing betel quid against it (Fig. 10).

Buccal mucosal cancers can be very small. In early stages (Fig. 11), They do not produce any symptoms; but a timely diagnosis would lead to an excellent prognosis.

**Cancer of the mid-buccal mucosa:** A majority of buccal cancers tend to be ulcerative and therefore, metastasize more

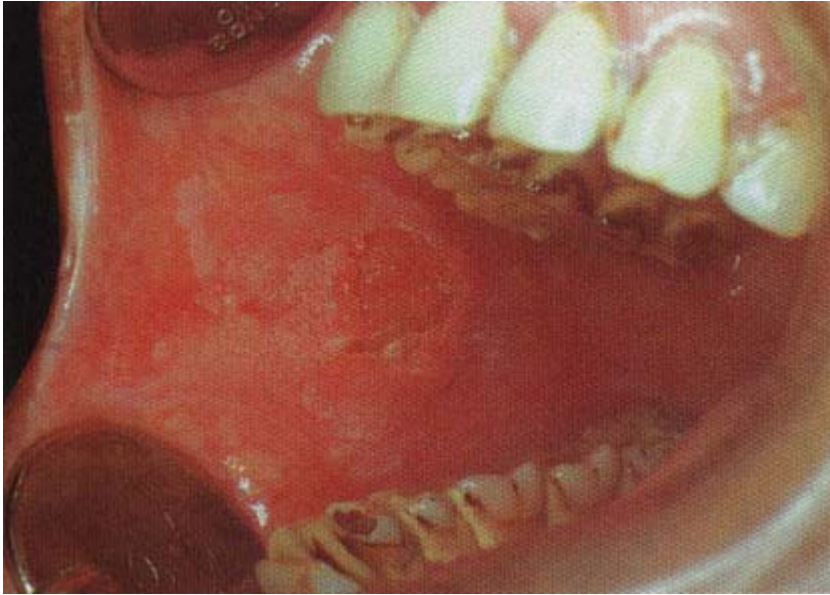


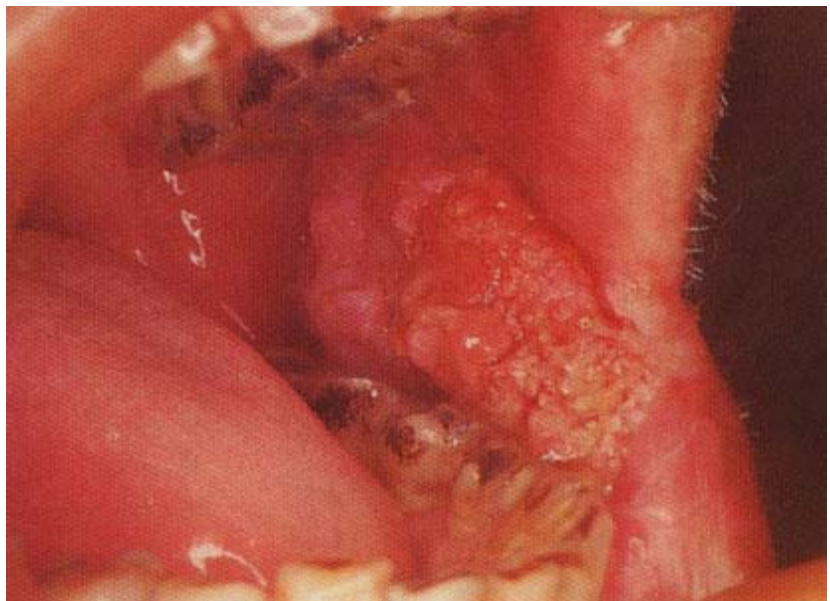
Fig. 12. A flat, well-circumscribed, red granular lesion in the center of the right buccal mucosa of a 42-year old female betel-quid chewer. The tumor, however, was indurated and had infiltrated deep into the tissue. Note a homogeneous leukoplakia adjacent to cancer.

frequently. Occasionally, the lesion may be flat and granular (Fig. 12). The frequent movement of the affected part may also contribute to the spread of the tumor in this location. Overall, lymph node

involvement may be observed in up to 78% of the buccal mucosal cancers.

Often, buccal mucosal lesions are very large in size when diagnosed (Fig. 13). This

Fig. 13. A verrucous carcinoma in a 59 year old male betel-quid chewer. The lesion involved the entire left buccal mucosa. Despite such a large size the regional lymph nodes were not affected.



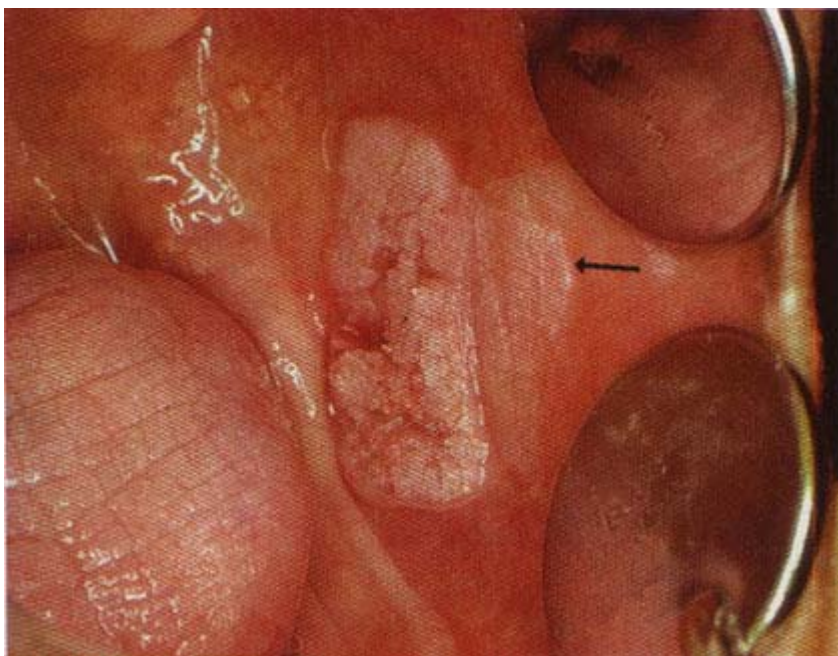


Fig. 14. An exophytic verrucous carcinoma in the left buccal mucosa with an adjacent homogeneous leukoplakia (arrow). The patient is a 55-year old male who chewed betel quid and smoked bidis.

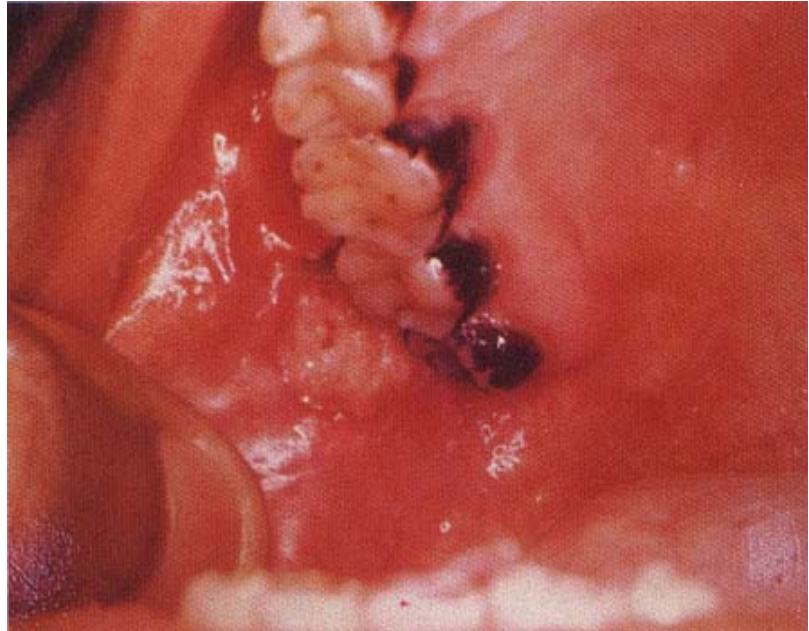
is especially true of verrucous carcinoma. Because of their slow growth these lesions tend to be ignored by the patient thereby resulting in a rather large tumor. About 58% of the verrucous carcinomas occur in the buccal mucosa. Verrucous carcinomas rarely involve the lymph nodes. Because of this feature, the preferred method of treatment is surgery and the prognosis is generally good. Radiation therapy is believed to result in the anaplastic transformation in verrucous carcinoma; but some reports also indicate a favorable prognosis to radiation treatment.

**Oral cancer with coexistent leukoplakia:** There appears to be some preponderance for cancer to occur in the left buccal mucosa rather than in the right. This perhaps due to the tendency to keep the betel quid on the

left side. Furthermore, most of the oral cancers arise either from leukoplakia, coexist with it (Fig. 14), or arise from submucous fibrosis (see section 2.5). In about 32% of oral cancers, leukoplakia can be found adjacent to the cancer. Initially, because of such coexistence, leukoplakia was envisioned as a precancerous lesion which was confirmed subsequently by other prospective studies (see section 2.2).

**Cancer of the upper buccal groove:** Small ulcerative cancers in the upper buccal groove (Fig. 15) may escape attention, especially if, while examining the mouth, the retraction of the cheek is improper. Primary cancers in the upper buccal groove are less frequent to those in the mandibular groove perhaps because the betel quid is most often held in the mandibular groove.

Fig. 15. An ulcerative lesion in the right upper buccal groove of a 52-year old male betel-quid chewer. The lesion is fibrin covered and asymptomatic.



**Cancer of the base of the tongue:** After the buccal mucosa, the tongue is the most frequent location for oral cancer. In nine areas in India, 50% of the oral cancers among men

[range 37-63%] and 27% among women [range 0-43%] occurred on the tongue; about 20% occurring in the base of the tongue, i.e., posterior one-third. Use of tobacco, especially

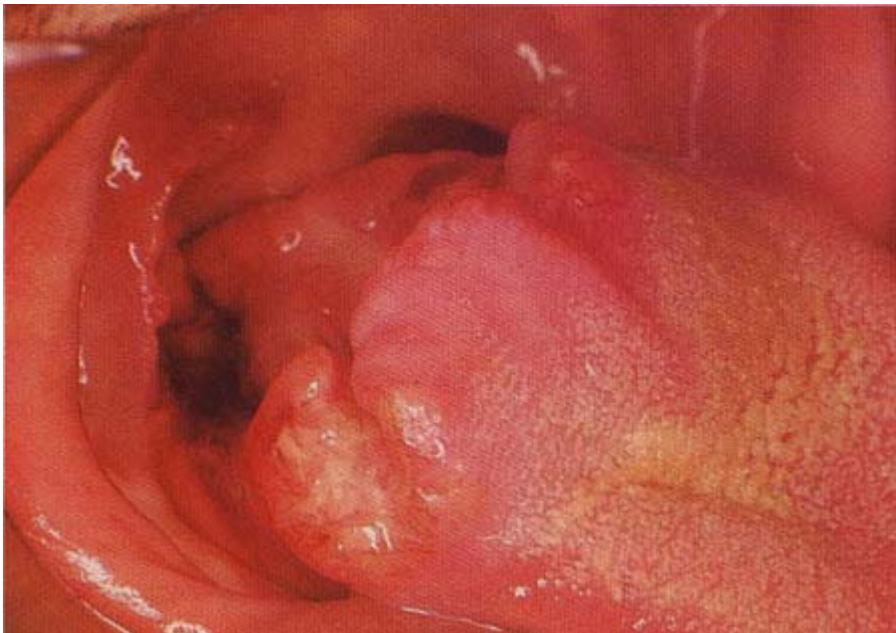


Fig. 16. An advanced ulcerated cancer at the posterior one-third of the tongue in a 63-year old male who chewed betel quid and smoked *bidis*. Note the anterior extension of the lesion.

*bidi* smoking, is strongly associated with cancer in this location. Patients with cancer in the posterior one-third of the tongue are

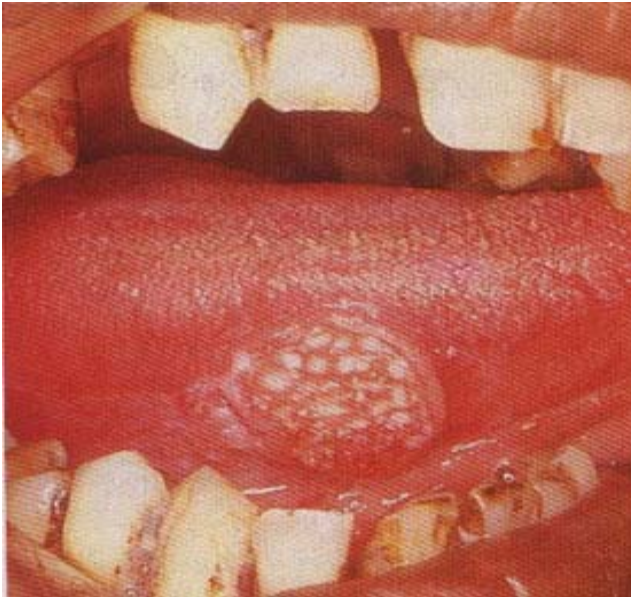


Fig. 17. An exophytic cancer having a white granular surface in the right margin and ventral surface of the tongue in a 35-year old male who smoked *bidis* and cigarettes. Note the everted margins.

likely to be older than those with cancer in other intraoral sites. Early lesions may produce symptoms like pain and sore throat, A majority of cancers in this location, however, are detected at an advanced stage (Fig. 16) generally due to the late recognition of symptoms by patients.

**Cancer of the lateral border:** Up to 80% of the tongue cancers occur in the anterior two-thirds, more frequently on its lateral margins and the ventral surface (Fig. 17).

Early cancer on the left lateral border of the tongue may appear like a leukoplakia (Fig.18)

**Cancer of the dorsum of the tongue:** The dorsum (Fig. 19) and tip of the tongue are rare locations for cancer. These sites, however, are more vulnerable in the presence



Fig. 18. Early cancer on the left margin of the tongue in a 48-year old male betel-quinid chewer in the form of white patches interspersed with erythematous and nodular areas.



Fig. 19. Cancer on the dorsum of the tongue in a 65-year old female betel-quin chewer who also has submucous fibrosis. The lesion is granular and flatish. Note the depigmented tongue, blanching, and pigmentation changes which are features of submucous fibrosis.

of submucous fibrosis, perhaps due to the generalized epithelial atrophy that is characteristic of submucous fibrosis. Overall, about two-third of tongue cancers show regional lymph node involvement.

**Cancer of the palate:** The hard palate is rather an uncommon location for a squamous cell carcinoma (Fig. 20). The exception is among reverse smokers, i.e. those who smoke with the lighted end inside the mouth

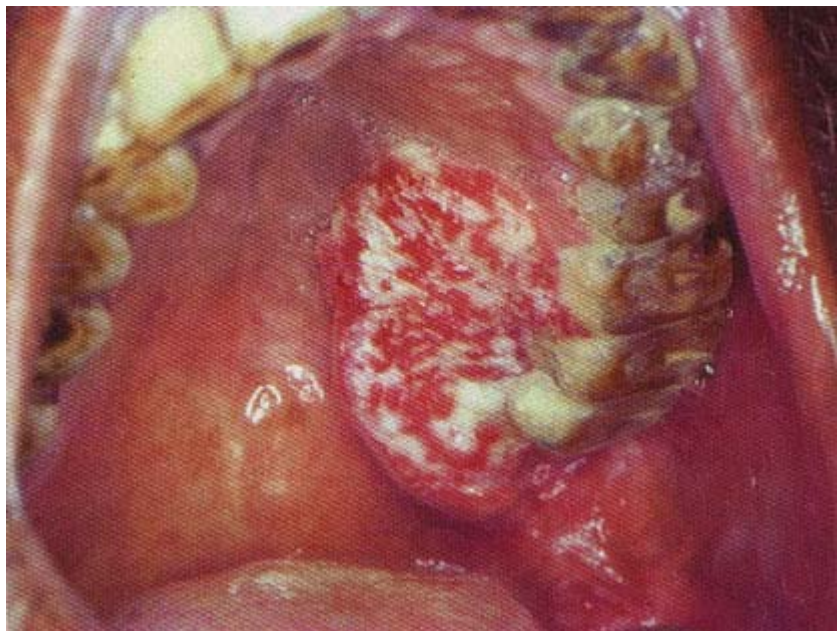


Fig. 20. A Palatal cancer in a 49-year old male *bidi* smoker.

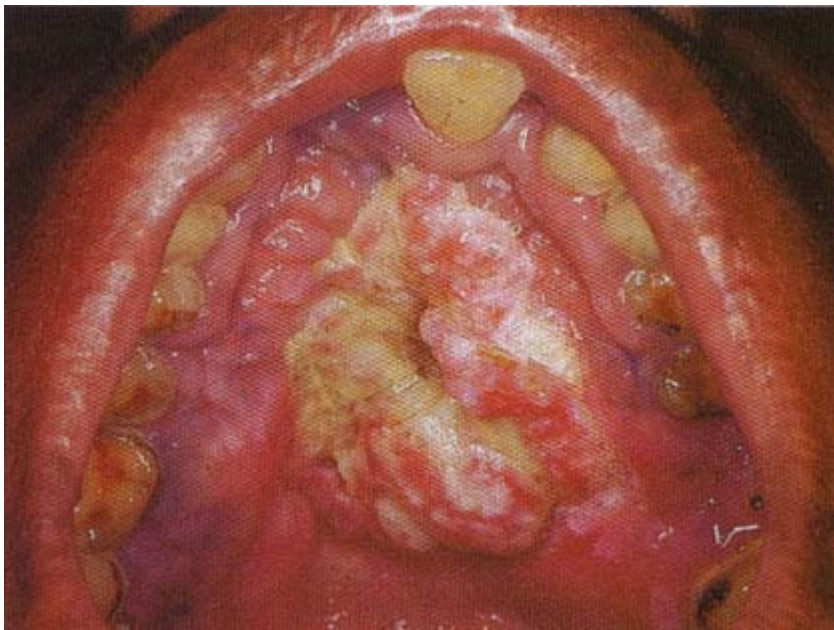


Fig. 21. An exophytic palatal cancer in a 45-year old female reverse *chutta* smoker from Srikakulam, Andhra Pradesh. Note the deep ulceration in the center of the growth.

(see Appendix I). Only 3-18% oral cancer occurs on the palate in areas where reverse smoking is not practiced. Conventional *chutta* smoking, i.e., smoking with the lighted end outside the mouth, also renders the palate more vulnerable for cancer as compared to cigarette and *bidi* smoking. The palate is also the site for minor salivary gland tumors and necrotizing sialometaplasia. Care must be exercised to distinguish them from a squamous cell carcinomas. About 63% of the palatal squamous cell carcinomas at diagnosis present as advanced stage lesions. Lymph node metastasis is observed in 50% of the palatal cancers.

**Cancer of the palate in a reverse smoker:** In an area where reverse *chutta* smoking is widespread, palatal cancer forms up to 48% of oral cancer. Such palatal cancers mostly originate from precancerous palatal changes

(see section 2.3). Generally, palatal cancers are exophytic and broad based (Fig. 21). They arise either in the center or on the glandular zone of the hard palate, perhaps depending on where the lighted end of the *chutta* is held in the mouth. Animal experimental studies suggest that heat potentiates the carcinogenic action of the pyrolyzed products of tobacco.

**Cancer of the floor of the mouth:** The floor of the mouth is not a common location for cancer in India. Only 3% of oral cancer among men [range 0-4%] and 2% among women [range 0-3%], occur in the floor of the mouth. Tobacco and alcohol use is responsible for cancer in this site. Interestingly, a high proportion of patients with floor of the mouth cancer were found to be *bidi* smokers and alcohol drinkers. In early stages, this cancer may appear like a reddish area (Fig. 22) or as a thickened mucosa.



Fig. 22. Cancer in the floor of the mouth appearing like a reddish in a 60-year old male *bidi* smoker who is also a heavy alcohol drinker.



Fig. 23. Nodular appearance of cancer in the floor of the mouth of a 65-year old male *bidi* smoker who drank alcohol.

Floor of the mouth cancer may also appear like a painless nodule (Fig. 23). Patients with floor of the mouth cancer may



Fig .24. Cancer in the maxillary gingiva of a 43-year old female tobacco chewer. It is red and nodular on the anterior maxillary gingiva and extended on to the upper labial groove where it is ulcerative. For many years preceding the development of this lesion, the patient had been keeping tobacco against the grossly carious and painful tooth in that location as a home remedy against pain from the carious tooth.

Complain of speech limitation, excessive salivation or referred pain in the ears. Alcohol abuse increases the permeability of the mucosa to carcinogens as well as interferes with the detoxification of carcinogens in the liver.

**Cancer of the gingiva:** Primary gingival cancer is not uncommon. It comprises 10% of the oral cancer among men [range 6-13%] and 16% among women [range 0-25%], respectively. Early gingival cancer may appear like an indolent ulcer, a small granuloma, or a nodule (Fig. 24). When the lesion is small, it is likely to be mistaken for an inflammatory condition. In many instances, gingival cancer can be exophytic (Fig. 25).

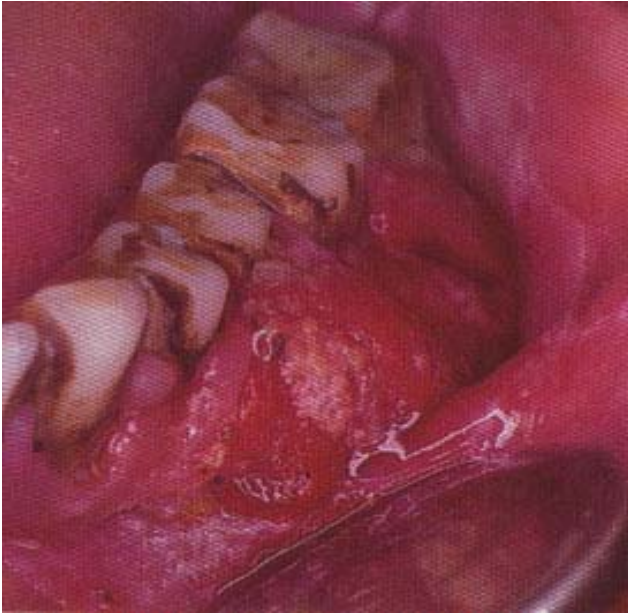


Fig. 25. An exophytic gingival cancer in a 43-year old female *khaini* user from Maharashtra.

with cancer of the gingival. Most cancers are exophytic in this location (Fig. 26). Sometimes, loosening of the teeth, mimicking a periodontal disease, may be an early symptom. Because of its proximity to the mandible, the tumor often extends into the bone; some 56% of the alveolar ridge cancers invade the mandible as compared to 19% from buccal cancers and 5-10% from cancers in the tongue, retromolar areas, and the floor of the mouth. The erosion of the bone may be obvious clinically (Fig. 27) or detected through radiologic examination. Regional lymph node involvement is also high (77-97%) in gingiva/alveolar ridge cancers, and accordingly the prognosis of cancer in these sites is often poor.

**Cancer of the alveolar ridge:** Cancer of the alveolar ridge is generally described together

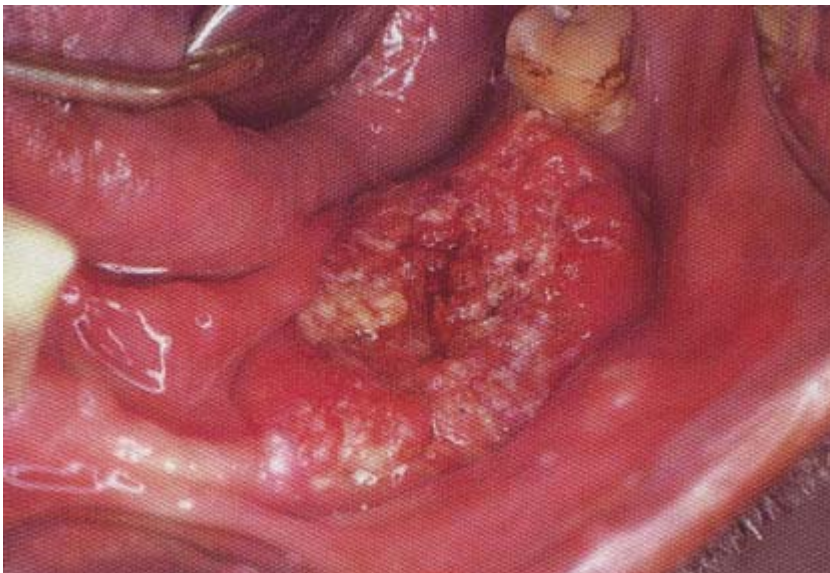


Fig. 26. An extensive exophytic cancer on the alveolar ridge of a 62-year old male *khaini* user from Maharashtra.



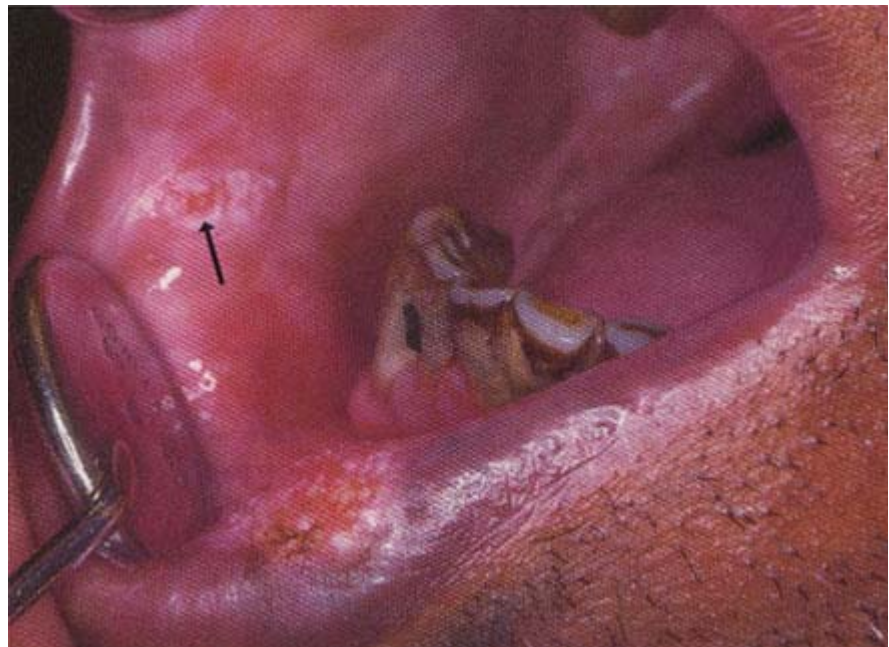
Fig. 27. Erosion of the bone due to cancer on the alveolar ridge of a 58-year old male *khaini* user from Maharashtra. Note the leukoplakia on the buccal mucosa.

### ***Multicentric oral cancer***

About 6% of the oral cancers in India are multicentric in origin, a term that implies

the occurrence of cancer in two or more sites either simultaneously (Fig. 28) or subsequent to the primary cancer. The occurrence of multicancer cancer is due to field

Fig. 28 A small nodular cancer near the right commissure (arrow) in a 60-year old male who chewed *pan* and smoked *bidis*. There was also an exophytic cancer with a nodular surface on the left side of the lower lip and the vermilion border. Microscopically, both were confirmed as squamous cell carcinomas.



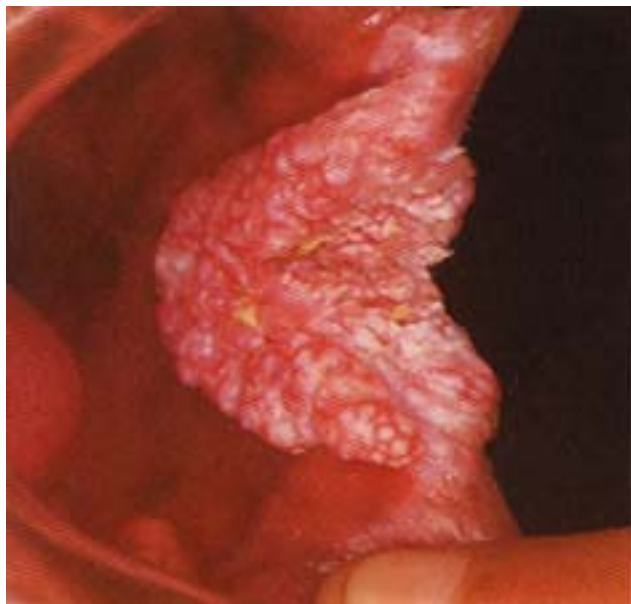


Fig. 29. “Sharp “ variety of verrucous hyperplasia in the left commissure and the buccal mucosa of a 63-year old male betel-quid chewer who was also a *bidi* smoker. The lesion consisted of numerous long, narrow, keratinized verrucous processes.

Concretization, a process in which a wide area is altered and predisposed to the development of cancer. The prognosis of patients with multicentric cancers is significantly lower than those with a single cancer.

***Some lesions that can be mistaken for oral cancer***

A variety of noncancerous lesions closely resemble oral cancer. They are, therefore, important from the differential diagnosis point of view. The examples can be many, but only a few select, common entries are described here. Unlike oral cancer, most of these lesions are not due to tobacco use.

**Verrucous hyperplasia:** Verrucous hyperplasia closely resembles verrucous carcinoma. It generally occurs in smokers on the gingiva/alveolar ridge and the buccal

mucosa. Clinically, verrucous hyperplasia is distinguished into “sharp” (Fig. 29) and “blunt” varieties (Fig. 30). Occasionally, areas of homogeneous leukoplakia are seen adjacent to this lesion or elsewhere in the mouth. Interestingly, 31% of verrucous hyperplasias arise from a leukoplakia, usually in 1-10 years. Microscopically, the “sharp” variety is characterized by pointed keratinized verrucous projection on the epithelial surface with epithelial hyperplasia; some degree of epithelial dysplasia may be present. Verrucous carcinoma or squamous cell carcinoma may be concurrently present with verrucous hyperplasia; verrucous hyperplasia may progress to a verrucous or a squamous cell carcinoma.

**Verrucous hyperplasia – blunt type:**

The “blunt” variety consists of border and flatter verrucous processes (Fig. 30) in which the



Fig. 30. “Blunt” type of verrucous hyperplasia in the right buccal mucosa of a 37-year old female betel-quid chewer. The lesion was flatish with “blunt” projections marked by heavy Keratinization on the surface.

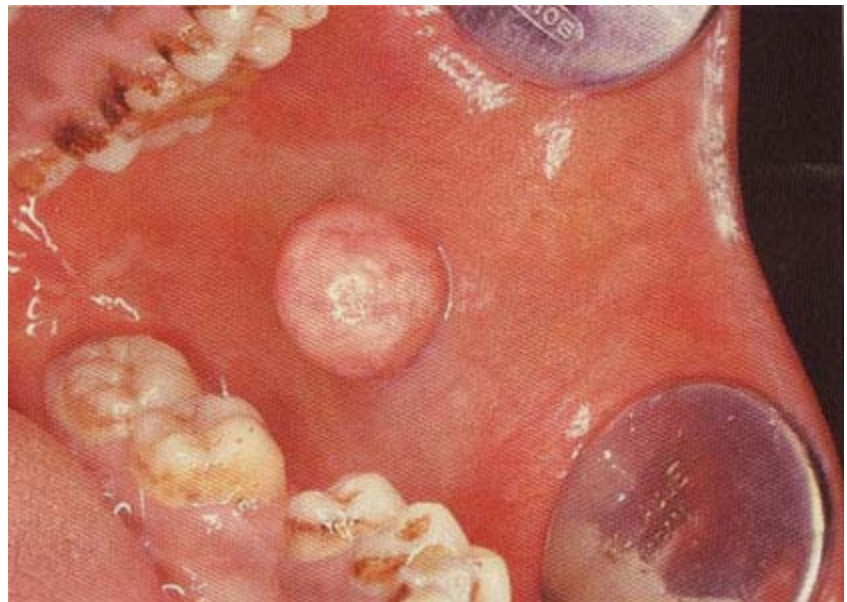


Fig. 31. A small papilloma on the right commissure of a 34-year old male *bidi* smoker.

keratinization may not be prominent. Microscopically, numerous dome shaped projection are seen on the surface with other features described earlier. Some investigators

believe that verrucous hyperplasia represents a variant of verrucous carcinoma. Conservative surgical excision is the treatment of choice.

Fig. 32. A sessile fibroma on the left buccal mucosa of a 28-year old male betel-quid chewer.



**Papilloma:** Papilloma is a benign counterpart of squamous cell carcinoma. Papilloma occurs in a variety of oral sites. It may be



Fig. 33. A lipoma in the substance of the left cheek causing an intraoral dome-shaped swelling. The patient is a 72-year old female who did not use tobacco. The surface is smooth, and the swelling was soft, fluctuant, and slightly lobulated. The mucosal surface was intact. The histology of this lesion is typical of a lipoma.

large or small (Fig. 31), pedunculated or sessile with numerous finger-like projections that are white due to Keratinization. Papillomas, especially the large ones, should be distinguished from verrucous carcinoma. Microscopically, a papilloma has a characteristic appearance that differs from verrucous carcinoma.

**Fibroma:** Fibroma is the most common benign connective tissue tumor of the oral mucosa. It can arise from any part of the oral mucosa. Fibromas are firm, well-demarcated, sessile or pedunculated lesion (Fig. 32). Often they are of long duration.

**Lipoma:** A clear distinction must be made between a submucosal swelling and an exophytic cancer arising from the surface



Fig. 34. A hemangioma in the left buccal mucosa of a 42-year old *bidi* smoker. It had been present for over 12 years. The lesion was soft and blanched on pressure indicating its vascular nature.

epithelium. Lipoma produces a characteristic submucosal swelling (Fig. 33) that is usually smooth, soft, and slightly lobulated. In contrast, in a cancer, the oral epithelium would not generally be intact.

**Hemangioma:** Hemangioma is a tumor of vascular origin that can occur anywhere in the oral mucosa. Some investigators believe that it represents a hamartoma, i.e., developmental malformations, in which excessive vasculature occurs in otherwise normal tissue. Hemangiomas are classified as capillary or cavernous types (Fig. 34). The color of the tumor varies from light red to



Fig. 35. A pedunculated pyogenic granuloma on the buccal gingiva of a 35-year old female. It was soft and bled on pressure. The red surface can be clearly seen on the lesion on the lingual gingiva.

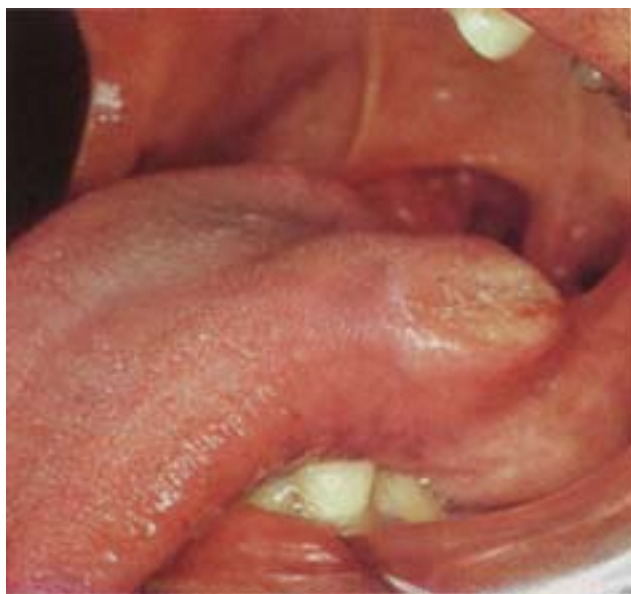


Fig. 36. A slightly elevated and ulcerative lesion in the left margin of the tongue in a 63-year old female who chewed tobacco. A broken tooth was impinging on the lesion.

pink or purple depending upon whether they are superficial or deep-seated. It is not very difficult to differentiate a hemangioma from a squamous cell carcinoma as the former is soft and vascular, sometimes with pulsation. Usually the duration of a hemangioma is long.

**Pyogenic granuloma:** Pyogenic granuloma is a tumor-like lesion rich in small blood vessel which usually occurs as an exaggerated response of the granulation tissue to mucosal trauma rather than due to any specific infective agent. About 66% occur on the gingival (Fig. 35). Pyogenic granulomas are generally soft, pedunculated, with a fibrin covered ulcerated surface. Microscopically, they show features that are different from a carcinoma.

**Traumatic lesions:** Quite frequently oral mucosa is subjected to trauma from sharp teeth (Figs. 36 & 37), denture flanges



Fig. 37. The ulceration healed within a month following the extraction of the offending tooth.

(Fig. 38& 38; Fig. 40) and self-inflicted injuries (Figs. 41& 42). Some of these lesions closely resemble a carcinoma. Although there are occasional reports of cancer arising from such irritated mucosal areas, there is no evidence that trauma is of etiologic importance in oral cancer. This, of course, does not imply that such lesions can be left untreated. Conversely, due to superimposed trauma an oral cancer may be misdiagnosed as a traumatic lesion. In evaluating traumatic lesions, the extent of trauma, duration of the lesion and the presence or absence of induration must be considered. Removal or irritation should be the first step in the management of these lesions. If such lesions persist beyond four weeks, or earlier if warranted, biopsy should be performed. Ulcerations caused by sharp teeth (Fig. 36) are exceedingly common and they subside with the extraction of the offending teeth (Fig. 37).

**Denture flange-related ulceration:** Ulceration from the denture flanges (Fig. 38) may be due to the over extension of the flange or because of the resorption of the ridge. The ulceration may be localized, or extend along the line of the flange (Fig. 39); it is often painful. Chronic denture-related ulcerations can lead to an irritation hyperplasia.

**Denture irritation hyperplasia:** Denture irritation hyperplasia consists of folds and redundancies of the oral mucosa (Fig. 40) at the site of irritation from denture flanges. If irritation continues after the healing of a denture-related ulceration, it is likely to lead to hyperplasia. The hyperplasia consists of a single flap or multiple folds of tissue. The most favored sites for irritation hyperplasias are the alveolar ridge and the vestibular sulcus.

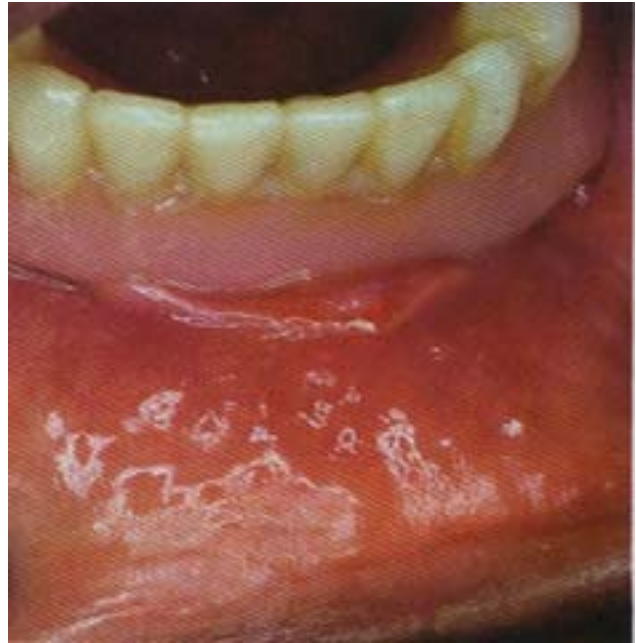


Fig. 38. An ulceration caused by the flange of a newly made denture in a 55-year old male. The ulceration is partly seen under the lower denture.

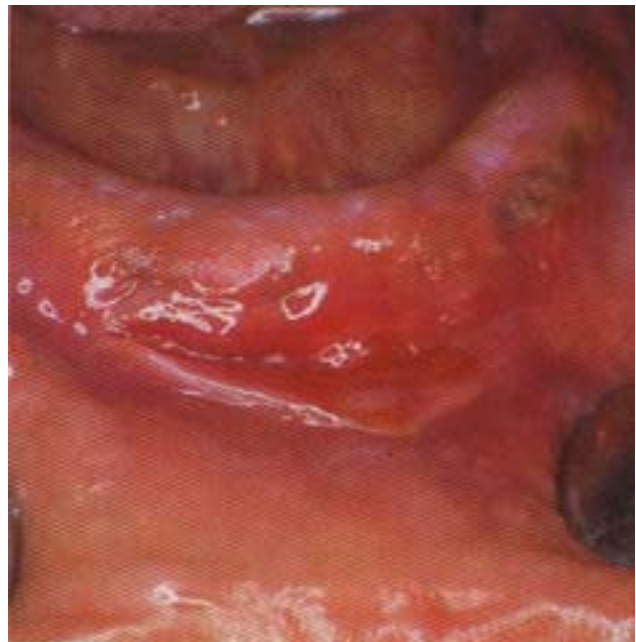


Fig. 39 The ulceration shown in Fig. 38 without the denture in position.



Fig. 40. Irritation hyperplasia associated with a lower denture in a 50-year old male. Note the fissure caused by the flange on the hyperplastic tissue.

**Self-inflicted injury:** A variety of self-inflicted accidental injuries of traumatic (Figs. 41 & 42), electrical, mechanical, thermal or

chemical origin may occur in the oral mucosa. They are often painful and present for a varying length of time. In most instances



Fig. 41. A painful fibrin covered deep ulceration of seven days duration on the right border and dorsum of the tongue of a 40-year old male. He was an alcoholic and bit the tongue accidentally when under the influence of alcoholic drinks.

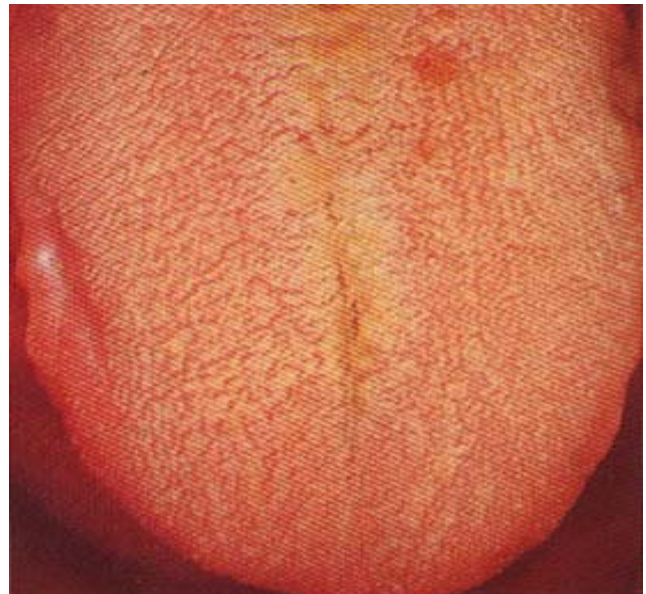


Fig. 42. Five weeks following the injury, the ulceration shown in fig. 41 healed considerably. In another two weeks, the healing was complete.

the history would be helpful in arriving at proper diagnosis. They often heal within a short period.

**Tuberculous ulcer:** Tuberculosis is a widely prevalent disease in India. The oral mucosa is affected rarely (up to 1.4%) among those with advanced pulmonary tuberculosis; a primary oral involvement is even less frequent. The sites most often affected in the mouth are the dorsum of the tongue and lips. Oral mucosal lesions are generally in the form of single or multiple ulcerations with irregular outlines and undermined borders (Fig. 43 & 44); these are usually painful and covers by yellowish fibrinous layer.



Fig. 44. Ulceration in the left commissure in the same patients shown in Fig. 43. Investigation confirmed an hitherto undetected pulmonary tuberculosis with sputum positive for tubercle bacilli. Microscopically, the ulcerations are typical of tuberculous infection. The patient was treated for pulmonary tuberculosis which also resulted in the healing of oral lesions.



Fig. 43. Fibrin covered ulceration (arrow) on the dorsum of the tongue in a 60-year old male *bidi* smoker. The patient also had similar ulceration on the right border of the tongue and the left ventral surface, left margin of the tongue and commissure (Fig. 44). The ulcerations are painful and undermined.

### **Clinical markers for prognosis of oral cancer**

The prognosis of oral cancer depends on the size of the lesion (“T”), extent of involvement of regional lymph nodes (“N”), distant metastasis (“M”), histology (“P”) and the specific intraoral location (“S”). Involvement of the regional lymph nodes (“N”) or distal spread (“M”) are very important clinical markers that determine the treatment plan and its outcome (see Appendix III).

**Early detection and prognosis:** Detection of small lesions, i.e., in early stages (Figs. 45 to 50), is possible by a simple methodical examination of the mouth in routine day-to-day clinical practice (see Appendix II). The earlier the detection, the better is the treatment result (Figs. 51 & 52). This conclusion derives from the fact that smaller lesions involve the regional lymph nodes less frequently than larger ones; they are also less likely to infiltrate into vital structures.

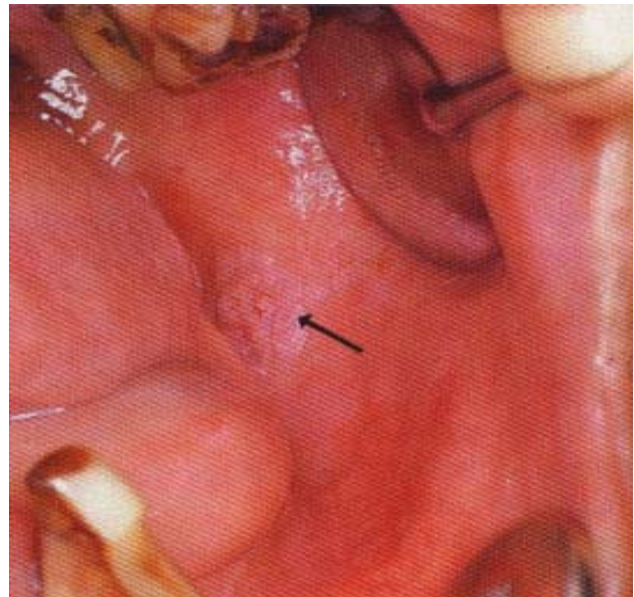


Fig. 45. A small (2 cm) cancer (arrow) in the left buccal mucosa of a 72-year old female betel-quin chewer detected during periodic follow-up. A biopsy confirmed the clinical diagnosis of cancer.

Disappointingly, only 10-15% of the oral cancers in India are detected when they are small, i.e. up to 4 cm.



Fig. 46. An ulcerated lesion with granular surface in the left buccal mucosa of a 62-year old male betel-quin chewer. Note the rolled borders.

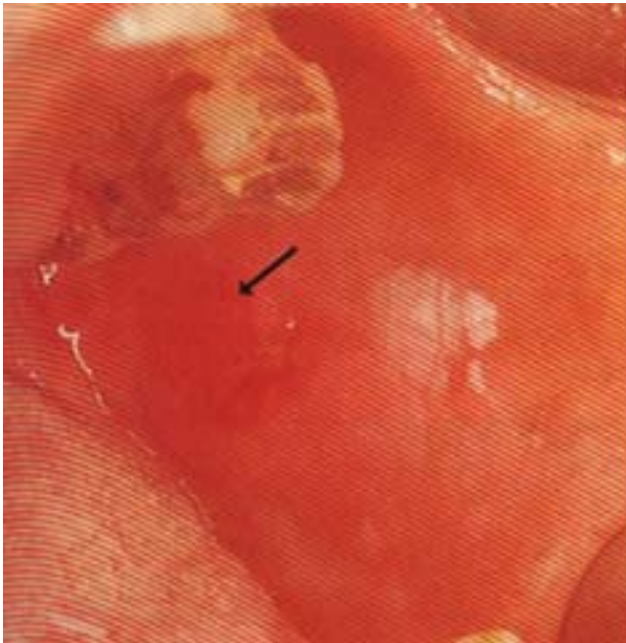


Fig. 47. A reddish ulceration with induration (arrow) on the left buccal mucosa of a 63-year old female betel-quin chewer. Note a leukoplakia in the anterior part. A biopsy from the ulceration revealed a squamous cell carcinoma

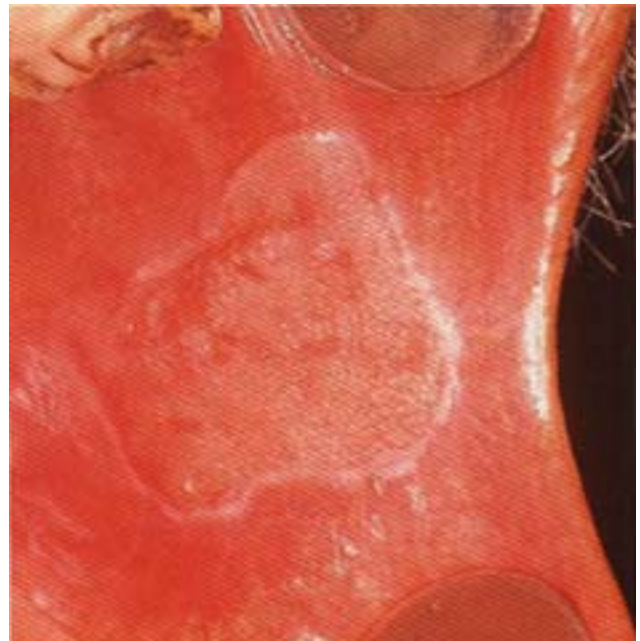


Fig. 49. A nodular leukoplakia in the left buccal mucosa of a 62-year old male betel-quin chewer. A biopsy showed a squamous cell carcinoma.



Fig. 48. A large flatish granular white lesion in the buccal mucosa of a 67-year male betel-quin chewer. Microscopically, it was a squamous cell carcinoma.



Fig. 50. A slightly exophytic cancer in the left border of the tongue in a 72-year old female betel-quin chewer.

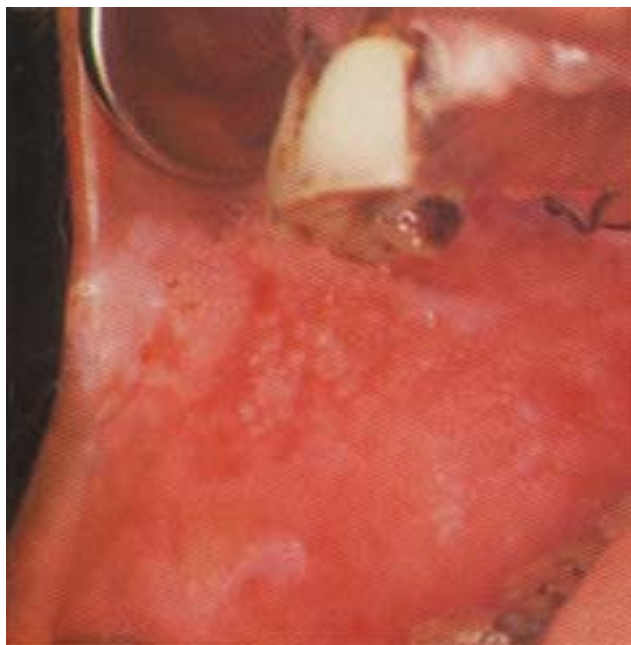


Fig. 51. a nodular leukoplakia in the right commissure and the buccal mucosa with slightly indurated ulceration posteriorly, in a 58-year old male who chewed betel-quinid and smoked *bidis*. A biopsy from the ulceration revealed a squamous cell carcinoma.

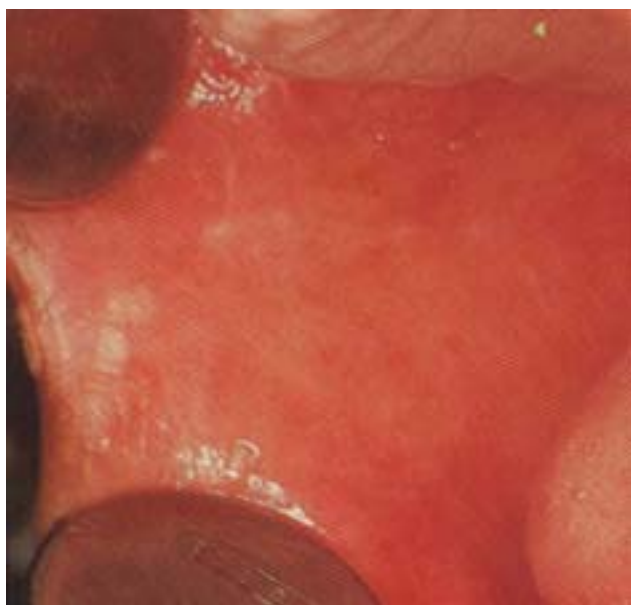


Fig. 52. The lesion shown in Fig. 51 was treated by radiation . Note the excellent response and absence of mutilation.

**Advanced cancer and involvement of regional lymph nodes:** With increase in the size of the tumor, there is an increase in the regional lymph node involvement, tissue destruction (Fig. 53) and invasion into vital structures. Overall, only 13% of the oral cancers diagnosed in six cancer registry areas in India were localized; 83% had regional lymph node involvement; and 4% had distal spread.



Fig. 53. Perforation of the right cheek due to cancer in a 60-year old male betel-quinid chewer. The perforation in the submandibular region is due to tumor deposits in the lymph nodes. The cervical chain of lymph nodes are also affected (arrow).

### ***Prognosis of oral cancer***

There is a wide variation in the post treatment survival of oral cancer patients. The overall 5-year survival rate was only 43% for all types of oral cancer treatment. This rather poor prognosis is due to late detection.

