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Oral Tumours

SUMMARY

The authors of this article review briefly the anatomy of the oral soft tissues and describe the more common benign and malignant tumours of the mouth, giving emphasis to their clinical features. (*Can Fam Physician* 1988; 34:1377-1382.)

Key words: benign oral tumours, malignant oral tumours, premalignant oral lesions

RÉSUMÉ

Les auteurs de cet article font une brève revue de l'anatomie des tissus mous de la bouche et décrivent les tumeurs bénignes et malignes les plus fréquentes de la cavité buccale, en insistant particulièrement sur leurs caractéristiques cliniques.

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A LARGE NUMBER of benign and malignant tumours may arise in the mouth and jaws. The authors of this paper will discuss the clinical features of the more frequently seen neoplasms; they will also discuss some of the non-neoplastic tumours, because of their importance in differential diagnosis. The discussion will be restricted to lesions in soft tissue, since intrabony lesions require radiographic investigations, which are not readily available in the offices of most family physicians. Information on intrabony lesions is available in the books listed in "For Further Reading" at the end of this article.

Normal Anatomy

The diagnosis of intraoral abnormalities requires an understanding of the normal anatomical structures found in the mouth, paying particular attention to specific features.

The oral cavity is lined with epithelium supported by vascular connective tissue. Those areas which overlie bone (hard palate, gingiva), as well as the dorsal aspect of the tongue, are keratinized, whereas the rest of the oral cavity is normally covered by a non-keratinizing epithelium. Many people also display a line of keratinization on the buccal mucosa which is parallel to the line of closure of the teeth. This white line is referred to as the "linea alba" and is the result of mild, chronic masticatory trauma. Keratinized epithelia have a white-pink colour; non-keratinized epithelia are pink-red. Most epithelia have a smooth surface, with the exception of the palate, with its rugae and the gingiva, which frequently has a rough or stippled appearance. In some areas, most notably the buccal mucosa and the lips, there are collections of sebaceous glands. These

glands appear as punctate yellow granules and are sometimes called "Fordyce's spots" or "granules". Areas of pigmentation may also be seen within the oral cavity, predominantly in dark-skinned individuals. These areas often appear as patches of brown-black gingiva, and are usually found in the wedge-shaped areas, the interdental papillae, between the teeth. The tongue may display pigmentation along its lateral border

Both minor (accessory) salivary glands and lymphoid tissue are normal constituents of the oral submucosa. Intraoral salivary glands are between 450 and 750 in number and can be found in the lips, cheeks, hard and soft palates, uvula, floor of mouth, tongue, retromolar area, and peri-tonsillar regions.¹ Any of these glands have the potential to undergo a wide range of pathological changes which can lead to a swelling. Lymphoid tissue is found mainly within Waldeyer's ring, although lymphoid aggregates can sometimes be found elsewhere in the oral cavity. The lymphoid tissue that is a normal component of the posterolateral

border of the tongue, and that appears as small, 2 mm to 3 mm nodules, is frequently misdiagnosed as an anomaly. The cervical chain of lymph nodes in the neck provides lymphatic drainage for the oral cavity, and as such, it is usually the first site of regional metastasis for intraoral malignancies.

Benign Mucosal Lesions

Fibroepithelial polyp

The fibroepithelial polyp (Figure 1) is the most common growth found in the oral cavity. This lesion is not a neoplasm; it is a reactive proliferation of epithelial and connective tissue in response to chronic, low-grade irritation. It has no age or sex predilection. The polyp may be either sessile or pedunculated and has a smooth white or red surface which can become ulcerated. The areas mostly commonly affected include the buccal mucosa, gingiva, tongue, lips, and palate. Proliferation of fibro-epithelial tissue can also occur along the borders of over-extended dentures. In all occurrences, treatment consists of simple excision combined with elimination of the source of irritation. The true neoplastic counterpart to the fibroepithelial polyp is the fibroma; it is extremely rare in the oral cavity.

Papilloma

Oral squamous papillomas are epithelial neoplasms that are pink or white in colour and have a papilliferous or cauliflower-like surface. They are found most commonly in young adults and have no sex predilection. Papil-

omas are seen most often on the tongue, lips, and palate. Some of these benign tumours are induced by the human papilloma virus. The clinical appearance of the papilloma is frequently indistinguishable from the common wart (*verruca vulgaris*) or from the genital wart (*condyloma acuminatum*). Common warts occur most often on the lips; oral condylomas tend to be larger than common warts and are multiple, often occurring on the lingual frenum. All of these lesions should be excised and submitted for pathological evaluation.

Submucosal Lesions

Granular cell tumours

This benign lesion was formerly called the granular cell myoblastoma. It presents as a painless, whitish-yellow submucosal swelling with normal overlying epithelium. Most granular cell tumours occur in the tongue, but on occasion, they can be found in the lips and floor of the mouth. The histogenesis of the granular cell tumour remains undecided; research has suggested that striated muscle, histocytes, fibroblasts, and neural tissue may all be possible sources of the tumour. Young adults are most frequently affected, but the tumour has no sex predilection. The granular cell tumour displays slow growth and is poorly demarcated. Hence treatment requires surgical excision with moderate margins. A variant, the congenital epulis of the newborn, usually occurs on the anterior maxilla of infants. A rare malignant form is also known.

Neurofibroma

Neural tumours are very common in the head and neck, and comprise over one-quarter of all peripheral-nerve tumours. The neurofibroma is a tumour of nerve-sheath cells, either Schwann cells or perineural fibroblasts. These lesions present as painless submucosal nodules and occur most often in the tongue. They may also be found in the lips, buccal mucosa, and alveolar ridge.

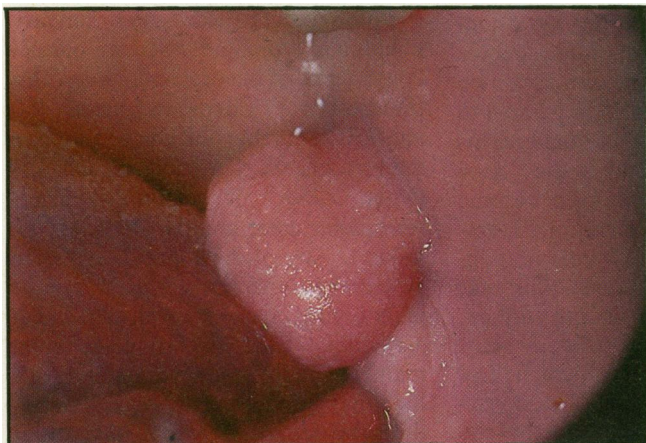
Intrabony lesions, usually associated with the inferior alveolar nerve, have also been described. Solitary neurofibromas are common among young adults and show no sex predilection. They are removed by simple excision and generally do not recur.

The presence of multiple neurofibromas is characteristic of neurofibromatosis. The lesions may be discrete and nodular or poorly demarcated and pendulous. Patients are frequently diagnosed in their teenage years and must be followed carefully because they carry a high (15%–20%) risk of developing malignant neural tumours.

Schwannoma

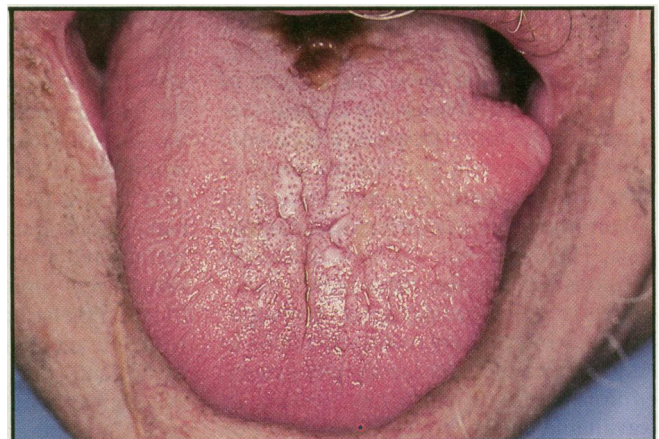
The schwannoma (or neurilemmoma) is a benign tumour of Schwann cells (Figure 2). Like the neurofibroma, the schwannoma is a slow-growing, painless mass that can present at any age. Schwannomas are two to four times more common in women than in men. More than half of all intraoral lesions occur in the tongue; the remainder are located throughout the oral cavity. This tumour is also found in

Figure 1
Fibro-Epithelial Polyp on Buccal Mucosa of a 42-Year-Old Male



This condition was caused by chronic cheek biting and had been enlarging slowly over a period of two years.

Figure 2
Schwannoma of the Tongue in a 53-Year-Old Male



This asymptomatic slow-growing lump must be biopsied to establish the diagnosis.

bone and in patients with neurofibromatosis. Solitary lesions require local excision. Some lesions have a cystic appearance.

Traumatic neuroma

The traumatic, or amputation, neuroma is not a true neoplasm. Rather, it represents an abortive attempt by a peripheral nerve to regenerate following section. This condition occurs most often when there is some impediment between the proximal part of the nerve and the distal nerve sheath. As might be expected, this lesion displays neither age nor sex specificity. In contrast to the benign neural tumours discussed earlier, the traumatic neuroma is usually tender or painful on palpation. Other possible symptoms include paraesthesia and loss of sensation. These submucosal nodules seldom exceed two cm in size and are most common in the region of the mental foramen. Other occurrences have been reported in the alveolar ridges, in the lips, and on the tongue, following deep lacerations. The treatment is simple excision.

Exostoses

Bony excrescences or tori are common findings in the oral cavity. They are not true neoplasms of bone, but are developmental phenomena. They rarely exceed one cm in diameter.

The torus palatinus is the most common exostosis, occurring in 20%–25% of the population. Women are affected almost twice as often as are men. This torus is found in the midline of the hard palate and can assume a variety of shapes. Most tori appear in the first three decades of life. The overlying mucosa may appear blanched and can become ulcerated.

In general, mandibular tori are observed bilaterally on the lingual aspects of the body of the mandible, above the mylohyoid line. They may be single or multi-lobulated and are usually located near the premolar teeth. From one per cent to 12% of Caucasian patients can be expected to have these tori; unlike the palatal tori, this condition has no sex predisposition.

Multiple bony exostoses are occasionally found on the buccal aspects of the posterior maxilla and, less frequently, on the labial aspects of the anterior regions of either jaw. These exostoses appear as multiple nodular excrescences covered by mucosa, which

may or may not be blanched. They are more common in Black patients.

Tori do not usually require treatment unless they become obtrusive, interfere with eating or speaking, or prevent construction of a denture. If treatment is necessary, the tori are removed surgically and rarely recur.

Osteoma

True tumours of bone are rare within the oral cavity. Patients with osteomas are generally between the ages of 10 and 50, and men are affected twice as often as are women. Osteomas can be found in periosteal and endosteal sites, and, on occasion, in soft tissue (osseous choristomas). They are generally asymptomatic and therefore require no treatment.

The presence of osteomas should always alert the clinician to the possibility that the patient has Gardner's syndrome. This autosomal-dominant condition is characterized by multiple osteomas, soft-tissue tumours, and adenomatous polyposis of the colon and rectum. It is the latter finding which is of greatest importance, since the polyps are premalignant.

Lipoma

Intraoral lipomas are rare, although they are common in other parts of the body. These sessile, or pedunculated, growths have a yellow hue and a soft, fluid consistency. In adults, they are usually found in the buccal mucosa, floor of the mouth, or tongue. Treatment consists of simple excision.

Pleomorphic adenoma

Approximately 70% of benign tumours of minor salivary glands are pleomorphic adenomas. They present as slow-growing, painless lumps, found most often in the palate. They occur in patients of all ages, and there is a slight predilection for women. Treatment consists of surgical excision with a margin of normal tissue because of the tendency of tumour nodules to lie outside the capsule. Careful follow-up is advised, since this tumour has a slight tendency to recur.

Hemangioma

Hemangiomas are proliferations of blood vessels. It is uncertain, however, whether this process is neoplastic or a developmental anomaly. Kaban and Mulliken² believe that these lesions can be satisfactorily divided into true

neoplasms and vascular malformations. Oral hemangiomas present as deep red or blue-red mucosal lesions that are flat or raised and, in general, are poorly circumscribed. The tongue, lips, buccal mucosa, and palate are the most frequently affected sites. Trauma may result in infection and ulceration. Most cases are evident within the first year of life, but they often go unnoticed until much later. Females are affected twice as often as are males. Some lesions may undergo spontaneous involution during the patient's first decade of life, while others can continue to grow concomitantly with the patient. Hemangiomas have been treated by a variety of methods including surgery, cryotherapy, radiotherapy, injection of sclerosing agents, and embolization.

Multiple angiomatous lesions have been associated with two syndromes: hereditary hemorrhagic telangiectasia (Osler-Weber-Rendu disease) and encephalotrigeminal angiomatosis (Sturge-Weber disease). In the former, the telangiectatic or angiomatous areas are found widely disseminated over the skin and oral mucosa. The lips, gingiva, buccal mucosa, and palate are most commonly affected. These lesions may undergo spontaneous hemorrhage requiring treatment for local hemostasis. Some cases can be life threatening. In patients who have Sturge-Weber syndrome, the angiomatous areas are unilateral and confined to all or part of the distribution of the trigeminal nerve, both on the face and within the mouth. These patients can also suffer from numerous neurological problems that result from the presence of leptomeningeal angiomas and calcifications.

Lymphangioma

Approximately 50% of lymphangiomas occur in the head and neck regions. Like the hemangioma, the pathogenesis of these lesions remains controversial: lymphangiomas also manifest within the first decade of life, but often go unnoticed and have no sex predilection. In the oral cavity, they occur most often in the tongue as well as in the palate, buccal mucosa, gingiva, and lips. Lymphangiomas frequently appear as nodular lesions and may impart a transparency to the overlying mucosa. Irritation can result in intralesional hemorrhage, causing the lymphangioma to be mistaken for a hemangioma. Large lesions of the tongue pro-

duce macroglossia. Treatment is by surgical excision or cryotherapy.

Pigmented Lesions

A wide range of lesions display pigmentation in the mouth. Many of these lesions reflect implantation of amalgam or post-inflammatory hyperpigmentation. Pigmented neoplasms in the oral cavity are uncommon, and their presence deserves careful examination. Melanoma comprises a much higher percentage of the pigmented tumours in the oral cavity than it does on the skin, where freckles and moles are commonplace.

Pigmented nevi

All types of nevi found in the skin may also occur in the oral cavity. Almost 40% of oral lesions are found in the palate, while a lower percentage is found in the labial and buccal mucosae, gingiva and alveolar ridge, and the vermillion border of the lip. Most cases be-

come evident in the third and fourth decades of the patient's life, and the condition has a predilection for women. Most nevi are of the intramucosal type. The blue nevus accounts for a much higher proportion of nevi in the mouth (30%–35%)³ than it does in the skin. Nevi are most often raised, sessile lesions with brown or blue-black pigmentation. Some lesions are macular and, in rare instances, pigmentation is absent. Intraoral nevi should be excised for diagnostic purposes.

Malignant melanoma

Intraoral melanoma accounts for only a small percentage of all cases of the tumour. It is, however, more common in Japanese and in Black populations than in others. Most cases of malignant melanoma occur in patients between the ages of 40 and 70, and men are afflicted twice as often as are women. The areas most frequently in-

involved are the palate and maxillary gingivae. In general, the lesions are nodular with dark, irregular pigmentation, and they may ulcerate. Treatment consists of wide surgical excision (when feasible) combined with regional lymph-node dissection. The prognosis for patients with intraoral melanoma is poorer than that for patients with cutaneous melanoma, which may reflect the late stage at which many of the tumours are diagnosed.

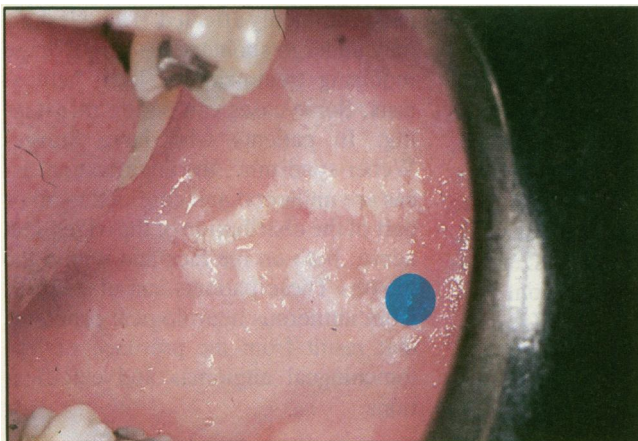
Premalignant Epithelial Lesions

The epithelium in the oral cavity may undergo a variety of dysplastic changes as a prelude to the development of invasive cancer. The early detection of such lesions is of paramount importance in reducing the risk of developing cancer.

Leukoplakia

Leukoplakia is a clinical term used to denote a white patch or plaque "that cannot be characterized clinically or

Figure 3
Irregular Hyperkeratinisation in the Buccal Mucosa of an 18-Year-Old Female



This patient had an empty habit of chewing her cheek. No epithelial dysplasia was present on microscopic examination, and the condition is essentially harmless.

Figure 4
Diffuse and Irregular Hyperkeratinisation with Erythematous Patches in an 88-Year-Old Man with a History of Alcoholism



Marked dysplasia was present microscopically. Since this photograph was taken, the patient developed two squamous cell carcinomas in the tongue, both of which have been surgically excised. He remains at high risk of developing further neoplasms.

pathologically as any other disease".⁴ This definition precludes the presence of epithelial dysplasia, since this condition is identifiable only during microscopic assessment (Figures 3 and 4). Hyperkeratosis is a more appropriate clinical term to apply to such lesions. The etiology of hyperkeratosis is diverse and can include chronic irritation, tobacco smoking and chewing, and alcohol abuse. Some cases are idiopathic.

Hyperkeratosis is most often seen in middle-aged and elderly men. The epithelium is usually white, as a result of increased thickness of keratin, and it may be flat, thickened, verruciform, or nodular in texture. Lesions may be single or multiple, large or small. The presence of red areas intermingled with white areas (speckled leukoplakia) has more serious implications. Whatever their appearance, these lesions must be examined microscopically to assess the degree of dysplasia present. Careful follow-up of patients with hyperkeratosis is mandatory, especially in those patients in whom no obvious physical irritation is present.

Erythroplakia

The definition of erythroplakia is analogous to that of leukoplakia, with two exceptions: the lesions appear as red, velvety patches, and epithelial atrophy, instead of hyperkeratosis, occurs (Figure 5). Most erythroplakias represent either severe dysplasia (including carcinoma in situ) or invasive cancer. Consequently, these lesions re-

quire immediate pathological assessment.

Malignant Tumours

Squamous cell carcinoma

Squamous cell (epidermoid) carcinoma is the most common malignancy found in the oral cavity. Most cases occur on the lower lip, tongue, and in the floor of the mouth (Figures 6 and 7). This cancer is most prevalent in males over the age of 40, but it has been found in all age groups. The incidence of squamous cell carcinoma in the oral cavity has increased in younger populations of late,⁵ as has the incidence of oral cancer in women, perhaps because of the greater social acceptability of smoking in recent years.

A number of etiologic factors are considered important in the genesis of squamous cell carcinoma. Smoking, alcohol abuse, and, especially, their combination are considered to be the most significant etiologic factors for intraoral cancer, while exposure to sunlight is most significant for lip cancer. The effect of other factors, such as nutrition, chronic irritation, and viral infections, remains unknown.

The clinical signs and symptoms of squamous cell carcinoma vary according to the site and extent of the lesion. Chronic, non-healing ulcers are common presenting features. These frequently have rolled borders and may be associated with a region of leukoplakia. The ulcer is usually indurated. Some lesions are more exophytic and may pre-

sent as large, fungating masses. Depending on the location, invasive squamous cell carcinoma may interfere with swallowing or speech, cause teeth to loosen, inhibit proper seating of dentures, or restrict mobility of the tongue. Swelling and increased salivation may be associated with the condition. However, few patients, even among those who have extensive lesions, complain of pain.

The treatment and prognosis of squamous cell carcinoma depends on the site and staging of the tumour. Lesions are usually treated by surgery, radiotherapy, or a combination of both modalities.

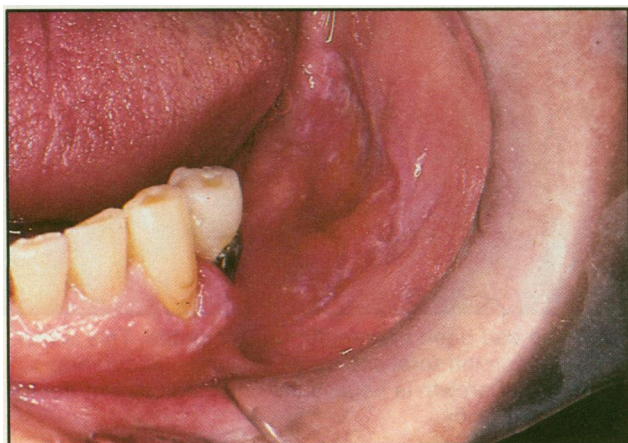
Verrucous carcinoma

Verrucous carcinoma usually occurs in elderly men and is associated, in some patients, with the long-standing use of chewing tobacco. This epithelial cancer usually has thick, white areas that have a warty or folded surface. The tumour grows slowly and is only superficially invasive. It is most commonly found on the buccal mucosa and the alveolar ridge or gingiva. Treatment is primarily surgical, and because of the exophytic nature of the lesion, the prognosis is excellent. These patients still require careful follow-up, since 10%–15% of them are subsequently at risk of developing invasive squamous cell carcinoma.

Mucoepidermoid tumour

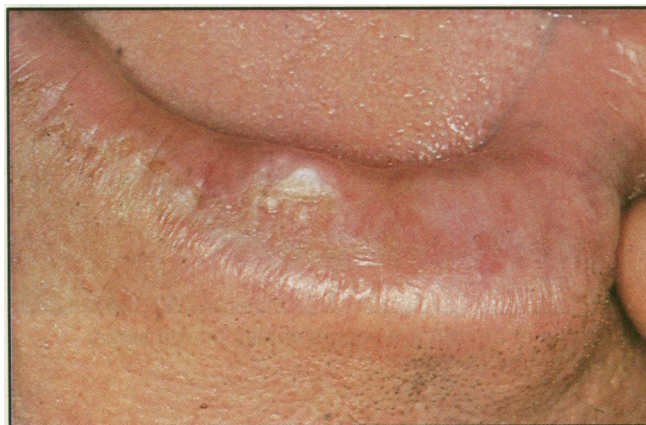
The mucoepidermoid tumour is a malignancy of salivary glands. This neoplasm occurs chiefly between the

Figure 5
Erythroplakia in the Alveolar and Buccal Mucosa of a 58-Year-Old Male



Biopsy showed severe epithelial dysplasia (carcinoma in situ).

Figure 6
Early Keratinizing Squamous Cell Carcinoma of the Lip in a 72-Year-Old Man Who Had Been a Farmer



The lip also shows actinic cheilitis with mild patchy hyperkeratosis at the skin/vermillion border and loss of elasticity. Lip carcinomas are usually well-differentiated and grow at a relatively slow rate.

third and fifth decades of life and has an equal sex distribution. The minor salivary glands in the mouth most often affected are those in the palate, buccal mucosa, tongue, and retromolar areas. Because of the histological features and the tumour aggressiveness, this tumour has been categorized as low- and high-grade malignancies. Low-grade lesions present as painless, slowly expanding submucosal swellings, whereas high-grade carcinomas grow at a much faster rate. Surgery remains the treatment of choice, and elective neck-node dissection is often indicated for high-grade lesions. Radiotherapy has also been a successful treatment modality. Prognosis for low-grade tumours is excellent, for high-grade tumours, fair. Central mucoepidermoid carcinoma of the mandible has also been described.

Adenoid cystic carcinoma

Adenoid cystic carcinoma is probably the most insidious of the salivary gland tumours. It usually occurs in patients over the age of 40, and both sexes are affected equally. The accessory glands affected most often are those in the palate and tongue (Figure 8). The tumours are often painless submucosal masses which may show surface ulceration. The adenoid cystic carcinoma is a slow-growing, but relentless, tumour with a propensity for great extension along nerves. It can cause ex-

tensive tissue destruction through direct extension, but only metastasizes late in its course. Treatment involves wide surgical excision or wide fields of radiation (or both). Because this tumour is known to recur many years after initial treatment, considerable long-term follow-up is required.

Lymphoma

Nearly all lymphomas occurring in the oral cavity are of the non-Hodgkin's type. Most intraoral cases of extranodal non-Hodgkin's lymphoma are found within Waldeyer's ring, but some are located on the palate and maxillary gingiva. These lesions occur predominantly in elderly patients, where they begin as a swelling that can progress to ulceration and then to the formation of extensive, necrotic masses. Some lesions develop within the jaw bone and may cause pain and mobility of teeth. Treatment is radiation or chemotherapy. The prognosis depends on the histological type and stage of the tumour.

Overview

This article has summarized the wide range of neoplastic tumours that can occur in the oral cavity. This information may prove useful to the family physician in his or her daily practice. ■

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Figure 7
Squamous Cell Carcinoma of the Tongue in a 68-Year-Old Male Presenting as a Typical Malignant Ulcer with Rolled Border



Carcinoma of the tongue occurs chiefly on the sides; it is rare on the dorsum.

Figure 8
Adenoid Cystic Carcinoma Arising in the Palatal Salivary Glands in a 34-Year-Old Female



The lesion had been present for three months. This is the most common intraoral site for all salivary gland tumours. The speed of growth is usually the chief indicator of benignity or malignancy.