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**Early
Detection
of Oral
Cancer** *Dentists
can make
a difference*



Santé
et Services sociaux

Québec



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MESSAGE FROM THE MINISTER OF HEALTH AND SOCIAL SERVICES



In my capacity as Minister of Health and Social Services of Quebec, I am pleased to support the publication of this oral cancer supplement to your professional magazine. Over 36,000 new cases of cancer are reported every year in Quebec, including more than 700 cases of oral and pharyngeal cancer. We must do everything we can to address this disturbing situation, in view of the risks of mortality and morbidity associated with this disease. In this context and with a view to improving public health in general and the quality of life of cancer patients, I have made the fight against cancer one of my priorities at the Ministère de la Santé et des Services sociaux.

The goals of the Ordre des dentistes du Québec in battling oral cancer fit in with the Ministère's mission and orientations, as one of our aims is to do more to prevent and cure all forms of cancer. This supplement offers an overview of what dentists can do to better detect and treat oral cancer and support oral cancer patients. It also describes the risk factors associated with oral cancer and explains dentists' options for dealing with potential cases of oral cancer and encourage patients to quit smoking.

Smoking is by far the main preventable cause of death in Quebec, claiming at least 13,000 victims a year. It also has many other harmful consequences for oral and dental health and is recognized as one of the major risk factors for oral and pharyngeal cancers.

Dentists can make a valuable contribution to anti-smoking efforts. By systematically identifying smokers in their practice, they can encourage and support them in efforts to quit. The Ministère, in co-operation with the health and social services network and other partners, has set up free resources throughout Quebec for people wishing to quit smoking. Those resources are listed in this supplement. I invite you to see what is available and direct your patients to these public services as necessary.

In closing, I would like to thank everyone who made this supplement possible, in particular the authors. I also wish to thank Dr. Robert Salois, President of the Ordre des dentistes du Québec, and the members of the Board of Directors for their commitment to the fight against oral cancer.

Philippe Couillard

A handwritten signature in black ink, appearing to read 'Philippe Couillard', with a stylized flourish at the end.

Minister of Health and Social Services

MESSAGE FROM THE PRESIDENT OF THE ORDRE DES DENTISTES DU QUÉBEC

I had just barely finished my first year of practice when I detected my first case of oral cancer. The 53-year-old man, a heavy smoker, had come to my office for his annual check-up. During the examination I noted an ulcerous lesion on the side of his tongue. I immediately referred him to a specialist, for a biopsy and diagnosis. It was indeed cancer, and the patient was treated rapidly. My clinical examination that day helped save a life.

Oral cancer is not the most common cancer, but it is one of the more dangerous and debilitating types. Dangerous, because it can be fatal if not diagnosed in time: a patient with stage IV cancer has only a 20% chance of survival, as compared with 80% for stage I cancers. Debilitating, because it can have significant consequences: changes in appearance, with an impact on the patient's self-esteem, and functional and physical disabilities including difficulty swallowing and speaking.

The Ordre des dentistes du Québec hopes that Quebec's 4,000 dentists will become partners in the early detection of oral cancer. As oral health specialists, they are ideally positioned to play an important part in this clinical effort. About 60% of Quebecers visit their dentists every year, so the dentist's office is the perfect place to make people aware of the risk factors for this type of cancer.

This supplement is intended for health professionals, generalist dentists and specialists. It contains all the necessary scientific and clinical background information on oral cancer. The articles were written by Quebec authors, including a number of leading oral health specialists. They address such key topics as the epidemiology and etiology of oral cancer; clinical examinations and screening tests; therapeutic procedures and possible complications; patient treatment in the Quebec health and social service system; the art of speaking to patients and answering their questions; and risk factors, including smoking. The Order also offers its members a chance to earn continuing development credits by completing the questionnaire at the end of the supplement.

A clinical examination by a dentist during a routine visit is enough to detect oral cancer. It is also a good idea to teach patients how to do regular self-examinations, since only one-third (35%) of oral cancers are detected as soon as they appear. This is where the members of the dental team, with the collaboration of other health professionals, can make all the difference.

Robert Salois



President



Photo: Laforest et Sabourin

The Epidemiology and Etiology of Oral and Pharyngeal Cancers in Canada and Quebec

By PAUL ALLISON, B.D.S., F.D.S.R.C.S., M.Sc., Ph.D.

ABSTRACT

Oral and pharyngeal cancers refer to malignancies of the lip, salivary glands, tongue, oral cavity, oropharynx, nasopharynx and hypopharynx. The large majority of malignancies in these anatomic sites are squamous cell carcinoma (i.e. malignancy of the squamous cells of the epithelium), although those diagnosed in the salivary glands and, in particular, the nasopharynx, are often histologically different cancer types; malignancies at other sites are rarely non-squamous cell carcinoma. This article will briefly describe the epidemiology, etiology—including risk estimation—and disease outcomes of oral and pharyngeal cancers in Canada and Quebec.

In Canada, in 1998 (the most recent year for which data are available), 2,926 people (2,014 men and 912 women) were newly diagnosed with oral or pharyngeal cancer.¹ This translates into age-controlled incidence rates, for the whole of Canada, of 13 new cases per 100,000 people in the male population and 5 new cases per 100,000 among women.¹ These data are age-standardized to allow comparisons across populations, since cancer incidence is related to age.

To put these figures in context, there were 125,875 (446 per 100,000 men and 346 per 100,000 women) new cancers diagnosed among Canadians in 1998. The most commonly diagnosed cancers were 19,085 men and women with lung cancer, 18,155 women with breast cancer, 16,887 people with colorectal cancer and 16,168 men with prostate cancer.¹ Between them, lung, breast, colorectal and prostate cancers made up 55.8% of all new cancer diagnoses during 1998. Most other cancer sites, including oral and pharyngeal cancers, represent a much smaller proportion of new cases each year. Oral and pharyngeal cancers contributed 3.1% of new cases in men and 1.5% of new cases in women. This made oral and pharyngeal cancers the 7th most common cancer (with stomach cancer and leukemia) in men and the 16th most common cancer in women.¹

The distribution of oral and pharyngeal cancers in the population depends on a number of variables, including region of residence, age, gender and anatomic site of the cancer. The incidence of oral and pharyngeal cancer varies across Canada, from 21 per 100,000 male population in Newfoundland to 11 per 100,000 male population in British Columbia, and from 6 per 100,000 female population in Manitoba and British Columbia to 3 per 100,000 female population in New Brunswick.¹ In Quebec, the age-standardized incidence of oral and pharyngeal cancers in 1998 was 13 per 100,000 men and 5 per 100,000 women.¹

Examining the distribution of oral and pharyngeal cancers diagnosed in 1998 across the whole of Canada by anatomic site, we see that there were 467 (16.0% of new cases) lip, 579 (19.8%) tongue, 330 (11.3%) salivary gland, 220 (7.5%) floor-of-mouth and 790 (27.0%) pharynx cancers, and 540 (18.6%) cancers at other sites, including the gingivae, buccal mucosa, retromolar region and hard and soft palates in the oral cavity.¹ This gives a rough idea of the relative distribution of cancers by site, indicating those anatomical sites most at risk of malignant disease. These data are shown in greater detail for the province of Quebec alone for the period 1984-94, in **Table 1**.² Here we see that in men, the most important individual sites were the tongue, lip, oropharynx and hypopharynx, in that order, while for women the most commonly affected sites were the tongue, salivary glands and oropharynx.

TABLE 1 Distribution of oral and pharyngeal cancers by anatomic site and gender, in Quebec, from 1984 to 1994

Anatomic site	Men	Women
Tongue	19.3%	21.1%
Lip	16.6%	7.6%
Oropharynx	13.5%	12.5%
Hypopharynx	10.8%	5.8%
Floor of mouth	9.4%	8.4%
Salivary glands	7.4%	17.0%
Nasopharynx	4.9%	5.0%
Gingivae	2.8%	4.9%
Other sites	15.2%	17.6%

Data taken from Louchini & Beaupré.²

Data for the province of Quebec for the year 2000 are available, illustrating how oral and pharyngeal cancer incidence varies with age. **Figure 1** shows the variation in the number of cancers diagnosed at selected oral and pharyngeal sites with age. The general pattern is of increasing incidence with age, peaking in the 60-69 age group. Salivary gland cancers occur in young people more often, however, and the incidence rises more gradually to peak in the 70-79 age group. The

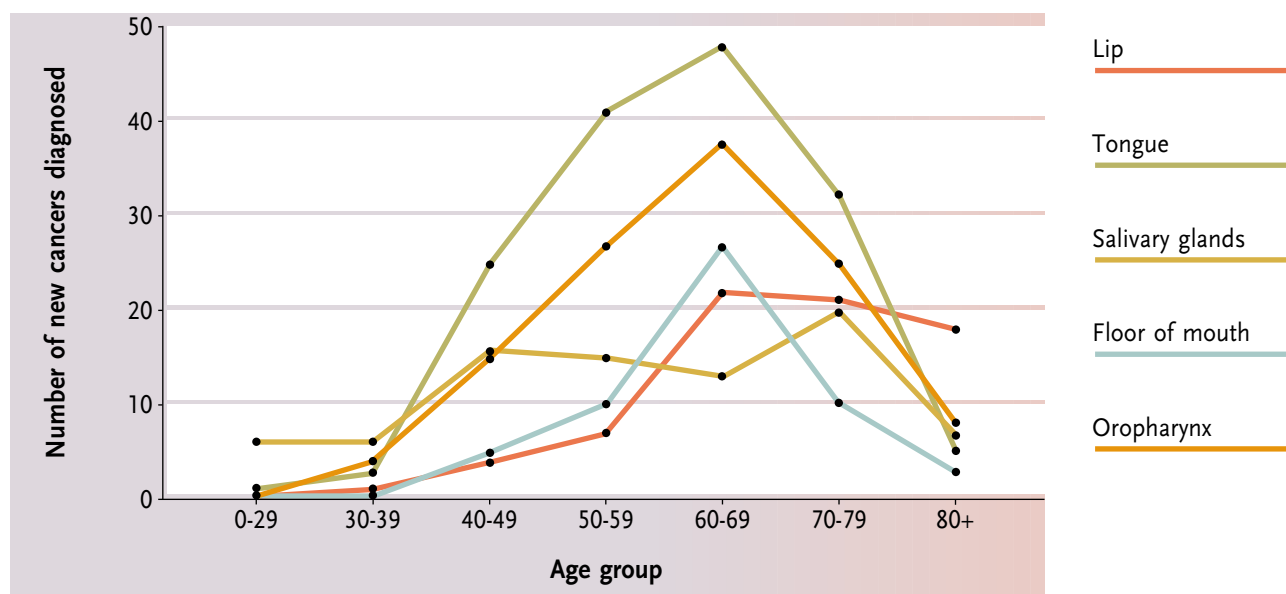
incidence of tongue and oropharyngeal cancers increases rapidly through the 40-49 and 50-59 age groups, peaking at 60-69 and then falling rapidly again. The incidence of lip and floor-of-mouth cancers rises somewhat more gradually through the 40s and 50s to peak in the 60s.

Looking at how oral and pharyngeal cancer incidence data have changed over time, we see that during the period 1991-98, the annual average change in incidence was a 3.6% reduction each year in men and a 1.2% reduction in women.¹ In other words, like cancers of the larynx and lung and others strongly associated with cigarette smoking, the incidence of oral and pharyngeal cancers has been falling with the reduction in numbers of smokers in the past 20 years.

DISEASE OUTCOMES

Once a patient has been diagnosed with an oral or pharyngeal cancer, what is likely to happen? Cancer outcomes tend to be described in a number of ways, one of them being mortality rates, which simply describe the number of people dying as a result of a certain cancer each year. In Canada, in 1999 (the latest year for which mortality data are available), 1,005 people died as a direct result of an oral or pharyngeal cancer, giving mortality rates of 5 per 100,000 men and 2 per 100,000 women for the country as a whole.¹ Once again, these mortality rates varied across the country, with Newfoundland having the highest rate, Saskatchewan the lowest and Quebec the same as the Canadian means.¹

FIGURE 1 Distribution of cancers at selected oral and pharyngeal sites during 2000 in Quebec, by age group



Data taken from the Fichier des tumeurs du Québec, 2000.

Another way of looking at deaths related to cancers is survival rates, i.e. the proportion of people diagnosed with a cancer and who survive a certain length of time. For example, two-year and five-year survival rates for oral and pharyngeal cancers refer to the proportions of people diagnosed with those cancers who are alive two and five years after their diagnosis. These data are available for Quebec and the USA, but not for Canada as a whole. In Quebec, the five-year survival rates during the period 1984-94 were 98% and 90% respectively for women and men with lip cancer, 75% and 63% respectively for women and men with salivary gland cancer and 54% and 40% respectively for women and men with tongue cancer.² Thus we see that survival rates vary by anatomic site and gender.

Furthermore, using Quebec data,² **Figure 2** shows how, with the exception of lip cancer, survival rates for tongue, salivary gland, floor-of-mouth and oropharyngeal cancers decrease with age (these are "relative survival" data, meaning that they control for the observation that the older you are the less likely you are to survive the next five years whether or not you have cancer).

Table 2 compares five-year survival rates for selected oral cancer sites over time in the USA³ and Quebec.² It shows that gender, and racial background in the USA, predict survival rates. The rates for Quebec are between those of the two US racial groups and are

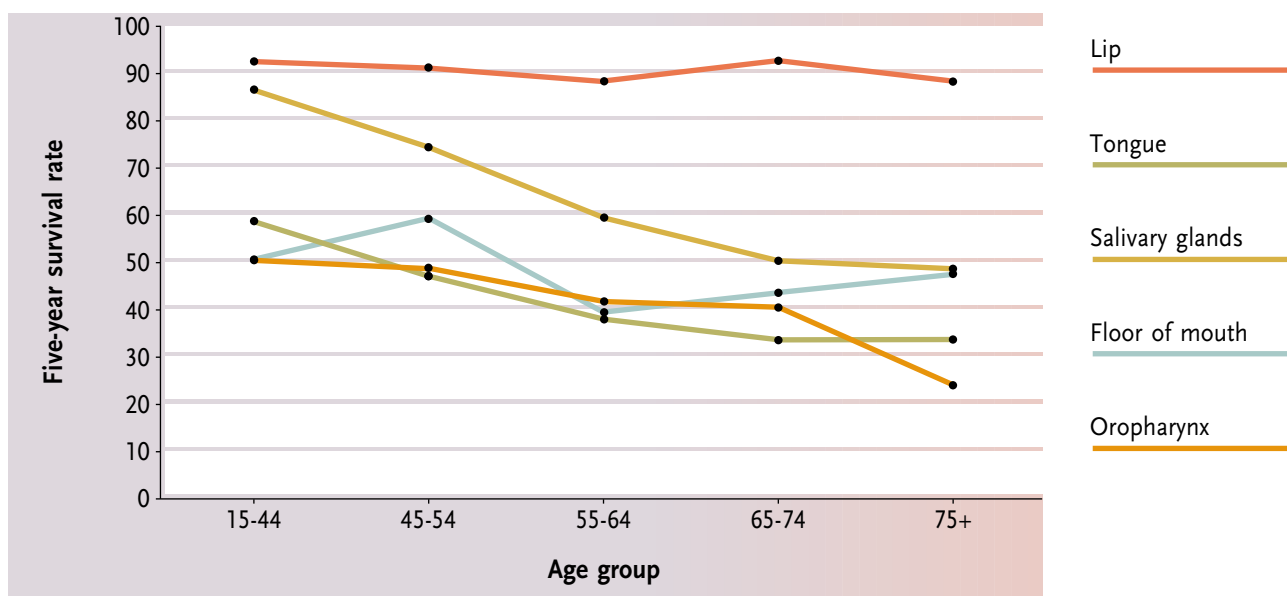
approximately the same as the overall US figures. The other observation is that there is no particular trend in survival rates over time in Quebec,² although in the USA there has been a slight overall improvement in five-year survival rates.⁴

**ORAL AND PHARYNGEAL CANCERS
ARE TWICE AS COMMON AMONG MEN
AS AMONG WOMEN.**

The most important determinant of survival rates is disease stage at diagnosis. Data for this are not available for Quebec or Canada, but in the USA, the data (**Table 3**) show very clearly how disease stage affects survival.⁴ In the USA, total population five-year survival rates for oral and pharyngeal cancers for the period 1992-98 varied from 82% for localized disease to 47% for regionally extended disease (e.g. cancer that has spread to the regional lymph nodes in the neck) and 23% for distant metastatic disease.⁴

Unfortunately, a well-recognized problem for oral and pharyngeal cancer outcomes is that many people with these cancers are identified late in the disease process and so are diagnosed with regional or metastatic disease, which radically reduces their chances of survival. Indeed, evidence from the USA shows that there has been no change in the number of people identified with

FIGURE 2 Five-year survival rates for selected oral and pharyngeal cancers diagnosed in men during 1984-94 in Quebec, by age group



Data taken from Louchini & Beaupré.²

TABLE 2 Five-year relative survival rates for selected oral cancer sites in Quebec and the USA, between 1973 and 1996

Anatomic site	Interval	Five-year relative survival rates					
		Men			Women		
		Quebec ^a	US whites ^b	US blacks	Quebec	US whites	US blacks
Lip	1973-1984		94	n.a. ^c		87	n.a.
	1985-1996		95	n.a.		95	n.a.
	1984-1986	90			94		
	1987-1989	88			96		
	1990-1992	90			100		
	1993-1995	86			98		
Tongue	1973-1984		41	25		48	40
	1985-1996		47	27		58	32
	1984-1986	37			58		
	1987-1989	35			52		
	1990-1992	43			50		
	1993-1995	42			57		
Floor of mouth	1973-1984		52	38		64	41
	1985-1996		52	33		63	59
	1984-1986	40			64		
	1987-1989	50			54		
	1990-1992	45			57		
	1993-1995	45			56		

^a Data taken from Louchini R, Beaupré M.²

^b Data taken from Shiboski CH, Shiboski SC, Silverman S Jr.³

^c No data available because of low numbers.

early-stage disease over the past 20 years.³ The situation is likely to be similar in Quebec and across Canada.

In addition to simply evaluating whether an individual diagnosed with oral or pharyngeal cancer survives, other outcomes that are regularly measured

TABLE 3 Five-year survival rates for oral and pharyngeal cancers diagnosed during 1992-98 in the USA, by race and stage at diagnosis

Cancer stage	Whites	Blacks	All races
Localized disease	82%	68%	82%
Regionally extended disease	49%	29%	47%
Distant metastatic disease	24%	19%	23%
All stages	59%	35%	56%

Data taken from Jemal A et al.⁴

include the presence of recurrent disease and of second primary cancers, and quality of life. Recurrent cancer is cancer returning at the same anatomic site as the primary cancer, whereas a second primary cancer is a new cancer occurring elsewhere in the mouth or pharynx. Recurrence is a common event in oral and pharyngeal cancers, with reports suggesting that 27-50% of patients will be affected within five years.⁵ In addition, second primary cancers in the mouth and pharynx region are a relatively common occurrence, with data suggesting that they occur in 5-30% of cases.⁶

QUALITY OF LIFE

The term quality of life is now commonly used in the health sciences research literature to describe the physical, functional, emotional and social problems people suffer as a result of a disease and/or its treatment. Quality of life is now commonly evaluated for all cancers, because although many people survive their cancer, their quality of life often deteriorates considerably. The evaluation of quality of life therefore enables clinicians caring for cancer patients to address some of their problems using various rehabilitative means. People with oral and

pharyngeal cancers suffer a great number of problems affecting their quality of life, including pain, xerostomia, difficulties chewing, swallowing, talking and kissing, problems with their teeth and/or dentures, loss of senses of taste and smell, embarrassment owing to their facial appearance and inability to communicate (so they socialize less), emotional and cognitive problems and financial difficulties brought on by losing their job, forced early retirement and/or treatment costs.^{7,8}

ETIOLOGY AND RISK ASSESSMENT

The most important risk factors for squamous cell carcinoma of the oral cavity and pharynx in Canada and most of the western world are tobacco consumption and excessive alcohol consumption. These two factors account for approximately 75% of oral and pharyngeal cancers in the western world^{9,10} and, although they can both cause these cancers alone, when combined they multiply the risk of oral or pharyngeal cancer.¹¹ This is illustrated by the data in **Table 4**: non-smoking heavy drinkers are 2.3 times more likely to have oral cancer than non-smoking light drinkers (reference group); and light-drinking heavy smokers are 17.6 times more likely to have oral cancer than non-smoking light drinkers. However, heavy-smoking, heavy-drinking individuals are 79.6 times more likely to have oral cancer than non-smoking light drinkers.

MANY PEOPLE WITH ORAL AND PHARYNGEAL CANCERS ARE IDENTIFIED LATE IN THE DISEASE PROCESS, WHICH RADICALLY REDUCES THEIR CHANCES OF SURVIVAL.

With respect to tobacco consumption, it is important to realize that although cigarettes are the most common form of tobacco delivery in Quebec and Canada, all other

forms (e.g. cigars, pipes, chewing tobacco and snuff tobacco) are equally carcinogenic. Snuff and chewing tobacco are rarely used in Quebec and Canada, however.¹² Along with tobacco smoking and excessive alcohol use, sunlight is a known cause of cancer of the vermilion border of the lip.¹³ Other risk factors have been associated with oral and pharyngeal cancers, but have yet to be confirmed as definite etiological agents.

There is good evidence that people whose diets are high in fresh fruit and vegetables are at decreased risk of oral or pharyngeal cancer,^{10,14} but it is not yet clear exactly what these foods contain that provides the protective effect. Another factor that may be associated, according to recent research, is human papillomaviruses.^{10,15} Once again, however, although there is good evidence to suggest an association between human papillomavirus and oral and pharyngeal cancers, no research has yet definitively shown whether the virus causes the cancer or whether the virus opportunistically infects malignant tissue once the neoplastic process has already been initiated. Other factors with even more equivocal evidence supporting their association with oral and pharyngeal cancers include use of mouthwash,¹⁰ oral hygiene,¹⁰ dental status¹⁰ and marijuana consumption¹⁶ (**Table 5**).

IMPORTANCE OF EARLY DETECTION

There are approximately 3,000 new cases of oral and pharyngeal cancer diagnosed in Canada each year, over 700 of them in Quebec. Of all the anatomic sites, the tongue is the most common in both sexes and the lip and the salivary glands the second most common sites in men and women respectively. However, overall, oral and pharyngeal cancers are twice as common among men and most frequently arise in people aged 45-80. Survival rates are very strongly associated with gender and the anatomic site and cancer stage at diagnosis.

TABLE 4 Risk of having oral and pharyngeal cancer in Italian men according to smoking and drinking habits

Smoking status	Total alcoholic drinks per week		
	Less than 35	35-59	60 or more
Non-smoker	1.0 (reference group)	1.6	2.3
Light smoker	3.1	5.4	10.9
Intermediate smoker	10.9	26.6	36.4
Heavy smoker	17.6	40.2	79.6

Data taken from Franceschi S et al.¹¹

TABLE 5 Risk factors for oral cavity and pharynx cancers

Definite etiologic factors	Tobacco and excessive alcohol consumption
Possible etiologic factors	Diet poor in fresh fruit and vegetables Human papillomavirus
Factors that may be associated with oral and pharyngeal cancers	Mouthwash Bad oral hygiene Dental status Marijuana
Other factors	Male sex Age (45 years or more)

DENTISTS CAN PLAY AN IMPORTANT ROLE IN IMPROVING EARLY DIAGNOSIS RATES OF ORAL AND PHARYNGEAL CANCERS.

Unfortunately, survival rates for oral and pharyngeal cancers have essentially remained stagnant over the past 30 years, largely because a high proportion of people are diagnosed with the disease once it has already spread to regional lymph nodes or further. In this context, dentists can play a role in improving early diagnosis rates by using appropriate risk assessment techniques (See *Oral Cancer Examination – The Best Way to Screen for Oral Cancer*, page 12). Risk assessment for oral and pharyngeal cancers must take into account an individual's gender, age, smoking status, alcohol consumption and fresh fruit and vegetable intake.

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ORAL CANCER EXAMINATION

The Best Way to Screen for Oral Cancer

BY BENOIT LALONDE, D.M.D., M.S.D., F.R.C.D.(C)

ABSTRACT

A clinical oral examination is a simple, fast and very efficient way of screening for oral lesions. It is painless and requires few instruments. By making it possible to diagnose cancers early, such examinations can make all the difference in a patient's chances of survival. This article describes the intraoral and extraoral examination technique, step by step.¹

Oral cancers present mainly as squamous cell carcinoma (epidermoid carcinoma). This type of malignant tumour accounts for approximately 90% of all oral cancers, with sometimes clearly evident signs including induration, fixation and invasion of underlying tissue. The fact that it is the epithelium, the top and most visible layer of the soft tissue, that is affected, makes the proliferation of cancerous tissue easy to detect.

EXTRAORAL EXAMINATION

Any facial asymmetry should be noted, especially in the parotid and cervical areas. Any growth should be cause for concern, especially among patients who spend considerable time in the sun. Palpation of the lymph nodes is an important part of the extraoral examination (Figure 1). Note the presence of any abnormal nodes (size and symptoms). Rule out any other causes such as a cold or dental infection.

The lip examination includes observation and palpation. Note any induration or asymmetry (Figure 2).



FIGURE 1



FIGURE 2

INTRAORAL EXAMINATION

This examination calls for a mirror, a 2" x 2" gauze square and an adequate light source. Examine the following areas.

Labial mucosa

With the patient's mouth closed, examine the upper and lower labial mucosa (Figures 3 and 4). Note any induration or anomaly.

Buccal mucosa

Use a mirror to retract the buccal mucosa (Figures 5 and 6). Note any change in pigmentation, induration or change in shape. Palpate the cheek. Closely examine the vestibular areas and the labial commissures.



FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6

Gingival mucosa

Examine the labial, vestibular and palatal aspects of the gingiva (**Figure 7**). Note any growth or abnormality in colour or pigmentation.

Dorsal surface of the tongue

The dorsal surface of the tongue is covered with different papillae: filiform, fungiform and vallate (circumvallate). Note any variation in texture, colour or symmetry of this part of the tongue (**Figure 8**). Gently palpate the dorsal surface.



FIGURE 7



FIGURE 8

Ventral surface of the tongue

This area is particularly at risk and so must be examined attentively. Gently hold the tip of the tongue, using the gauze pad, and gently move the tongue to the right and then to the left (**Figures 9 and 10**). Palpate the exposed ventral surface. Once again, observe any abnormal variation (induration, erythema, etc.). If this makes the patient nauseous, do not hold the tongue; ask the patient to place his or her tongue in his or her cheek so as to expose the area to be examined. The foliate papillae, toward the posterior of the ventral surface, should also be examined and palpated.

Floor of the mouth

There are two steps to the examination of the floor of the mouth. Begin with an intraoral examination, asking the patient to raise the tongue out of the way (**Figure 11**) and then to decontract it so that you can examine the rear of the floor of the mouth, using the mirror to gently push the tongue out of the way.

Then palpate the floor of the mouth (**Figure 12**). Place one finger inside the mouth, to reach the deepest and most posterior area. Place another finger in the same area, but outside the mouth, and palpate the sub-mandibular salivary gland, which is relatively large, but mobile. Note any abnormalities.



FIGURE 9



FIGURE 10



FIGURE 11



FIGURE 12

Palate

The last step is an examination of the hard and soft palate. The soft palate is elevated by asking the patient to say "Ah" (**Figure 13**). In some cases, you will be able to examine the posterior wall of the oropharynx (**Figure 14**). Once again, note any suspicious growth, variation in colour of the mucosa or chronic ulcers. The soft palate may show benign (pleomorphic adenoma) or malignant (cylindroma, adenocarcinoma) growths.



FIGURE 13



FIGURE 14

Clinical oral examination: points to remember

- Make sure you have proper access to cervical structures, for example by asking the patient to loosen his tie.
- Remove all removable prostheses before starting the examination.
- Many malignant tumours occur on the floor of the mouth, on the tongue, the soft palate, the oropharynx and the gingiva-alveolar ridge complex.
- Oral cancers are mainly squamous cell type and most often present as an induration or asymptomatic ulcer.
- Once the cause has been eliminated, traumatic lesions generally disappear in less than two weeks.

DIAGNOSTIC TESTS

Despite the development of new techniques for oral cancer screening, a standardized clinical oral examination remains the most efficient of all. Clinical manifestations of oral cancer should normally alert the clinician. A dentist who detects a suspicious lesion may use a diagnostic test, i.e. a biopsy, and different diagnostic tools.

Biopsy

A biopsy is definitely the only way of diagnosing oral cancer. For small lesions, an excisional biopsy is preferable, so as to completely remove the tissues affected. For more extensive lesions, an incisional biopsy is generally preferable.

Exfoliative cytology

Exfoliative cytology has the advantage of not requiring local anesthetic. However, only the superficial layers of the epithelium are removed, so the examination is limited by the quantity and quality of the tissue sampled.

Brush biopsy

Brush biopsies are commonly used in certain medical specialties, especially in gynecology. This technique is thought to be more effective than classic cytology, since it allows the clinician to remove deeper layers of the epithelium. It is marketed under the name *Oral CD-X*. Dentists must use their clinical judgment in assessing the suspicious nature of the lesion, since this technique can never replace a scalpel biopsy.

Toluidine blue

The toluidine blue test has been known and documented for decades. This dye stains neoplastic cells, although whitish lesions usually do not retain the dye very well. It is essential to remember that dye may also be retained by traumatic lesions or chronic ulcers, which are totally benign. Once again, clinicians must understand that this test is a diagnostic aid, and must not delay a biopsy.

ViziLite

The use of acetic acid for visual examinations of the mucosa using a special lamp is a technique used in gynecology, where it is known as colposcopy. The light emitted by the lamp makes suspicious lesions appear opaque white. These lamps are marketed in the United States for examinations of the oral cavity under the name *ViziLite*. Their efficacy in detecting oral cancer has yet to be determined with certainty, however.

DNA analysis

Leukoplakias are considered pre-cancerous lesions. A recent study² showed that the DNA of cells obtained from a leukoplakic biopsy of the oral cavity could be used as markers for determining the risk of a benign tumour becoming malignant. An abnormal (aneuploid) DNA content would appear to point to a risk of malignancy. A means of analyzing this marker could eventually be used to help clinicians predict which lesions are the most likely to develop into cancers.

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Clinical Manifestations of Oral Cancer

BY RÉNALD PÉRUSSE, D.M.D., M.D., L.M.C.C., F.R.C.D.(C)

ABSTRACT

Squamous cell carcinoma is the most common oral malignancy. This type of cancer can take different forms and affects mainly the tongue, floor of the mouth, soft palate, oropharynx and gingiva-alveolar ridge complex. This article is intended to familiarize dentists with the clinical manifestations of oral squamous cell carcinoma, so that they can detect them at an early stage and directly improve the survival rates of their patients.

Malignant oral tumours may be primary or metastatic, epithelial (carcinomas), glandular (adenocarcinomas) or mesenchymatous (sarcomas) in origin, and may sometimes be related to a malignant hemopathy such as leukemia or lymphoma. Squamous cell carcinoma represents over 90% of all oral cancers, and is two to three times as prevalent in men as in women. The main risk factors for this cancer, i.e. smoking and chronic alcohol abuse, are well known. Most cases are detected in individuals over age 45, although cancers of the tongue are increasingly being diagnosed among adults under 40 (4% to 6%).¹ This trend is probably due to early exposure to recognized risk factors or certain habits, in particular the use of cannabis, on the rise among young adults.²

Oral squamous cell carcinoma may occur in various forms: leukoplakia, erythroplakia, erythroleukoplakia, a chronic ulcer, a swollen mass or an endophytic lesion. Early-stage lesions are often seemingly innocent and totally asymptomatic, while advanced lesions are typically indurated and may be associated with considerable pain. Squamous cell carcinoma occurs mainly on the tongue, floor of the mouth, soft palate, oropharynx and gingiva-alveolar ridge complex, particularly in the mandibular region.

CLINICAL MANIFESTATIONS

Leukoplakia

Leukoplakia is a white patch that cannot be rubbed off and cannot be characterized clinically or histologically as any other disease, e.g. frictional keratosis, lichen planus, leukoedema or chronic candidiasis. Leukoplakia is a clinical term used to describe a keratinized white lesion and, in histological terms, encompasses a number of benign, dysplastic or malignant alterations. The authors of a study of 3,256 leukoplakias found that 3.1% and 4.6% of their specimens, respectively, revealed the presence of squamous cell carcinoma and carcinoma *in situ* (severe dysplasia).³

SQUAMOUS CELL CARCINOMA REPRESENTS OVER 90% OF ALL ORAL CANCERS, AND IS TWO TO THREE TIMES AS PREVALENT IN MEN AS IN WOMEN.

Leukoplakia accounts for approximately 85% of all precancerous oral lesions observed.⁴ The lower lip and the gingiva and buccal mucosa are the most common sites of leukoplakia.⁵ However, the most serious lesions occur in the tissues of the tongue, the floor of the mouth and the soft palate, where they present a high risk of becoming malignant³ (Figure 1).



FIGURE 1: *Squamous cell carcinoma of the soft palate presenting as a leukoplakia*

Leukoplakias may be grouped into two categories: homogenous leukoplakias and non-homogenous leukoplakias.

- Homogenous leukoplakia appears as a white patch that cannot be rubbed off, slightly raised, rough or wrinkled.
- Non-homogenous leukoplakias comprise atypical leukoplakias such as nodular leukoplakia, granular leukoplakia, verrucous leukoplakia and erythroleukoplakia. A variant of verrucous leukoplakia, known as proliferative verrucous leukoplakia, generally occurs among women over age 50. This form of leukoplakia is aggressive and often multifocal, and degenerates successively into verrucous hyperplasia, verrucous carcinoma and squamous cell carcinoma. The prognosis in such cases is very poor.

In clinical terms, leukoplakia follows a well-defined sequence as it progresses to a malignant tumour: from a superficial white patch it becomes a much thicker, fissured, granular, warty or nodular plaque, sometimes associated with a local inflammatory reaction (erythroleukoplakia).

Erythroplakia

Erythroplakia is a red patch that cannot be characterized clinically or histologically as any other disease (inflammatory lesion, traumatic lesion, erythematous candidiasis, etc.). It has certain points in common with leukoplakia in etiological and epidemiological terms. Although it is less frequent than typical leukoplakia, erythroplakia is a much more serious lesion, since in most (90%) cases, it is the manifestation of an invasive carcinoma or carcinoma *in situ* (severe dysplasia).⁶

The soft palate, the tongue and floor of the mouth are the most common sites for erythroplakia. It usually manifests in the form of a well-demarcated red patch, most often clinically asymptomatic (Figure 2). It may be associated with certain leukoplakic transformations (erythroleukoplakia) and may occur around the edges of an advanced squamous cell carcinoma. If the dentist discovers this kind of lesion, particularly in a smoker, it is cause for serious concern. If it has been present for over two weeks, a biopsy is essential to determine whether it is squamous cell carcinoma.



FIGURE 2: *Squamous cell carcinoma of the left side of the tongue, presenting as an erythroplakia*

Erythroleukoplakia

Erythroleukoplakia, also called speckled leukoplakia, is a mixed lesion, generally asymptomatic, made up of keratotic and erythematous foci, that falls into the non-homogenous leukoplakia category. Erythroleukoplakia should not be confused with certain mixed lesions, such as discoid lupus or atrophic lichen planus, which are usually bilateral and often painful. The buccal mucosa, tongue, soft palate and floor of the mouth are the most common sites. Like leukoplakia and erythroplakia, erythroleukoplakia may be the manifestation of squamous cell carcinoma. In addition, it is frequently observed around the edges of an advanced squamous cell carcinoma.

Chronic ulcer

In its early stages, squamous cell carcinoma may take the form of a chronic ulcer, totally asymptomatic in clinical terms (**Figure 3**). The ulcer may develop from a leukoplakia, making it very suspicious. Any lesion of this kind must be regarded as malignant until proved otherwise, particularly if it is indurated or slightly fungating.



FIGURE 3: Squamous cell carcinoma of the tongue and floor of the mouth, presenting as a chronic ulcer and nodular leukoplakia

Exophytic or endophytic lesion

Without treatment, squamous cell carcinoma tends to transform into an exophytic or endophytic lesion, i.e. an indurated swollen mass or an invasive lesion that invades deeper tissues, thereby considerably increasing the likelihood of distant metastasis. At this stage there is usually no doubt as to the diagnosis, but it must be confirmed with a biopsy.

- Exophytic carcinoma appears as an indurated whitish or pinkish growth, with a papillary or warty surface that may be partly ulcerated (**Figure 4**).



FIGURE 4: Exophytic carcinoma of the right ventral surface of the tongue

- Endophytic carcinoma is an ulcero-infiltrative lesion, typically indurated, depressed or sunken, which presents a raised edge from which the cancerous cells extend laterally (**Figure 5**). Intense pain caused by the invasion of the adjacent nerve plexus may accompany advanced squamous cell carcinoma.



FIGURE 5: Endophytic carcinoma of the upper left alveolar ridge and the palatal arch

AREAS AFFECTED

Slightly more than half of all oral cancers are cancers of the **tongue**. They tend to affect mainly the posterior-lateral regions, but may also affect the anterior-lateral or ventral and, more rarely, the dorsal surface. Cancer of the tongue, like cancer of the floor of the mouth, tends to metastasize quickly. In their early stages, lesions can be confused with a benign process and are often clinically asymptomatic. Thus patients may present a small harmless-looking keratotic focus, an atypical erythema or a traumatic-looking superficial ulcer. More advanced lesions infiltrate or deform the surface of the tongue, usually taking the form of a swollen mass that may be indurated, ulcerated or necrosed, combined with leukoplakic or erythroplakic foci (**Figure 4**). These lesions may also bleed easily.

Cancer of the tongue often tends to invade the floor of the mouth, the tonsillar fossa and the soft palate, when it develops in the posterior-lateral region. Cancers of the posterior region may lead to odynophagia (pain on swallowing), dysphagia, trouble speaking and chewing, reflex otalgia and lingual paresthesia.

Cancer of the **floor of the mouth** is the second most common type of oral cancer. It generally begins as a leukoplakia, erythroplakia or erythroleukoplakia. If not treated, it will transform into an exophytic or endophytic (infiltrating) lesion that may metastasize to distant regions. Cancer of the floor of the mouth normally occurs on the median line, near the lingual frenum (**Figure 6**). It often tends to invade the ventral surface of the tongue and the internal surface of the mandible, making treatment more complex. The posterior part of the floor of the mouth is more rarely affected.



FIGURE 6: *Squamous cell carcinoma of the floor of the mouth and ventral surface of the tongue*

Heavy drinking, combined with the effects of smoking, is an important risk factor in the pathogenesis of cancer of the floor of the mouth.⁷ This site is often affected among alcoholics, as are the base of the tongue, the oropharynx and the supralaryngeal area, which are in direct contact with alcohol.⁸ Studies on animals have shown that alcohol causes atrophy and excessive regeneration in buccal mucosa cells, which could exacerbate the effects of smoking on the keratinocytes of the buccal epithelium.⁹

The **soft palate** is another oral squamous cell cancer site. Cancer of the soft palate, which is much more frequent than cancer of the hard palate, generally begins as a leukoplakia or erythroplakia that presents no clinical symptoms whatsoever. Most cases occur in the lateral portion of the soft palate (**Figure 1**) and may then extend to the tonsillar fossa and even the adjacent part of the tongue and floor of the mouth. The patient then presents symptoms such as pain, odynophagia, otalgia, dysphagia and dysarthria. In fact, 42% of squamous cell cancers of the soft palate and tonsillar region are associated with occult metastases of the cervical region,¹⁰ even if there are no clinically palpable nodes, a factor that explains the poor prognosis sometimes associated with this type of cancer.

The **gingiva** and **alveolar ridge** are other possible squamous cell cancer sites. Cancer of the gingiva is difficult to diagnose and may be confused with a benign growth or local periodontal problem (**Figure 7**). It tends to invade the periodontal ligament and destroy the bony support, making the tooth sensitive and mobile. Cancer of the alveolar ridge may manifest as a chronic ulcer, an endophytic lesion (**Figure 5**) or a swollen (exophytic) mass that may considerably deform the alveolar ridge (**Figure 8**). This type of cancer can be confused with a fibrous hyperplasia (*epulis fissuratum*)



FIGURE 7: *Verrucous carcinoma of the gingiva, in the area of 21-22*



FIGURE 8: *Squamous cell carcinoma of the lower right alveolar ridge, invading the adjacent part of the floor of the mouth and the tongue*

and cause dentures to become loose, a fairly frequent reason for consulting the dentist. It may destroy a large part of the alveolar bone and invade adjacent regions, including the superior and inferior vestibule, the hard palate or the floor of the mouth, making it more complex to remove. Most cancers of the alveolar ridge are observed in the inferior maxillary, in the posterior region.

The prognosis for squamous cell cancer of the retro-molar trigone is not good. This type of cancer tends to develop behind the last lower molar and then infiltrate the adjacent part of the buccal mucosa, the anterior side of the mandibular ramus, the internal pterygoids muscle, the soft palate and the tonsillar fossa. Metastases to the lymph nodes are observed among most patients (78%) at diagnosis.¹¹

The **buccal mucosa** and **hard palate** are the two sites least often affected by squamous cell cancer. Carcinoma of the buccal mucosa generally takes the form of an indurated, partially ulcerated exophytic lesion, and generally includes a leukoplakic or erythroplakic component (**Figure 9**). Squamous cell carcinoma of the hard palate is an often extensive, indurated and ulcerated lesion (endophytic tumour) that must be distinguished from other malignant processes and, in particular, from the different adenocarcinomas that can affect the palate, such as mucoepidermoid carcinoma, adenoid cystic carcinoma, polymorphous low-grade adenocarcinoma, mixed malignant tumours and acinic cell adenocarcinoma.



FIGURE 9: *Squamous cell carcinoma of the posterior part of the right buccal mucosa*

Squamous cell carcinoma of the lower lip (**Figure 10**) behaves more like a squamous cell carcinoma of the skin than an intraoral squamous cell carcinoma. The main recognized risk factors for intraoral squamous cell carcinoma, i.e. tobacco and drinking, play a much less important role. Most cancers of the lower lip occur among white men over age 60, and are linked to prolonged exposure to the sun. The upper lip is rarely affected by squamous cell carcinoma, but it is the site of basocellular carcinomas.



FIGURE 10: *Squamous cell carcinoma affecting almost all of the lower lip*

Squamous cell carcinoma of the lower lip generally develops on a leukoplakia or a focus of actinic cheilitis. It initially takes the form of a crust or superficial indurated ulcer and then progresses to a much more extensive lesion, which deforms and deeply infiltrates the lip. Metastasis to local lymph nodes is observed among 2% to 5% of patients at the time of the initial diagnosis.^{12,13} Generally speaking, squamous cell carcinoma of the lower lip is a slow-growing tumour. Most cases are detected at stage I or II, according to the T.N.M. classification, and are associated with a relatively good five-year survival rate.¹³

The diagnostic parameters for the T.N.M. classification are described on page 32.

THE DENTIST'S DECISIVE ROLE

Despite the development of new therapeutic approaches, there has been barely any improvement in the survival rate for patients with oral squamous cell carcinoma over the past three decades, for the simple reason that many malignant tumours are too far advanced by the time they are discovered. Only early detection can help to improve the prognosis for oral cancer. And this goal cannot be met without the active participation of dentists. It is up to them to show leadership in combating this disease.

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Case Reports

BY MARTIN T. TYLER, D.D.S., M.Ed., F.R.C.D. (C)

The following cases are meant to refresh your decision-making skills for management of oral cancer. Answers to these case reports are listed on pages 42 – 43.

CLINICAL CASE 1

A 40-year-old male reports to the hospital dental clinic immediately after being dismissed from a busy hospital emergency room with palliative therapy for swollen gums. When examined by the dentist in the emergency room, the patient shows great malaise, and his chief complaint is: "I have marbles in my mouth." The clinical exam reveals generalized extremely swollen engorged interdental gingival papillae of the facial, palatal and lingual surfaces of the attached gingivae. The medical history is unremarkable except for a recent increase in severe fatigue and weakness. The patient's vital signs are normal, but he says he has had intermittent fevers and "night sweats."

The best course of action for the hospital dentist is:

- A.** Immediately assess the patient's periodontal status with probing and radiographs.
- B.** Have laboratory studies done (complete blood count with a differential) before any dental procedure is performed.
- C.** Consult with the physician before any dental procedure is performed.
- D.** Perform gentle punch biopsy of the most typical enlarged interdental gingival papilla.



CLINICAL CASE 2

A 51-year-old Caucasian male reports to the dental office for a routine periodic examination. The patient was a heavy smoker until five years ago. He drinks only on social occasions. Because of his busy work and travel schedule, he has missed several biannual dental check-ups. When questioned during the examination about a raised, indurated, painless nodule on the midlateral border of his tongue, the patient insists that it is due only to his biting his tongue, a habit that he says has caused the lesion to increase in size in the last month. The patient intends to leave the country for an important meeting and wants to defer the immediate biopsy you recommend until he returns from Europe in about a month.



Your best course of action is:

- A.** Arrange a biopsy appointment on the first available date after the patient returns.
- B.** Counsel the patient about the possible serious consequences of leaving the lesion untreated and insist on having an excisional biopsy prior to his departure.

CLINICAL CASE 3

A 76-year-old male complains of bleeding from a fast-growing but painless enlargement of the upper left gum. The patient has not smoked for 30 years and rarely drinks. The clinical examination reveals mild generalized gingival enlargement with two large, firm non-purulent masses; the larger one on the maxillary left facial gingiva demonstrates moderate mobility of the teeth involved. The smaller mass is on the edentulous ridge of the adjacent area. The patient says he has no symptoms from the lower mass or from any teeth. The gingival masses look identical. The patient very reluctantly consents to a biopsy if no teeth are removed. The biopsy is taken from the upper mass only; the histopathologic diagnosis of pyogenic granuloma is returned a week later, and when the patient returns to the clinic the upper mass is unchanged; the lower mass is now larger than the upper mass and now has a greyish-red granular

appearance. On the second visit, a panoramic radiograph is taken and shows irregular resorption of cortical and medullary bone under soft tissue of the mandibular lesion, which appears consistent with neoplastic invasion. The patient is again persuaded that biopsy is necessary and reassured that no teeth will be removed. The biopsy of the lower mass reveals squamous cell carcinoma with invasion of the mandible.

A more efficient diagnostic approach in this case would have been:

- A.** Perform biopsies on both masses, even though they looked identical and even though the patient's chief complaint was bleeding from the maxillary mass.
- B.** Take a radiograph of both suspicious lesions at the initial visit.
- C.** Do not allow the patient's reluctance to have a biopsy or lose teeth to influence sound reasoning and clinical judgment, and make a greater effort to persuade the patient to consent to biopsy of all suspicious areas at the initial visit.



CLINICAL CASE 4

A 60-year-old Caucasian male fisherman, who spends his winters in Florida, visits the dental office concerned that he may have a recurrence of cancer on his lower lip. He had carcinoma of the lower lip followed by successful surgical treatment six years ago. In addition to the social history of chronic sun exposure, you notice actinic damage to the face, a distinct loss of definition of the vermilion border, and crusting surface irregularities on the lower lip.

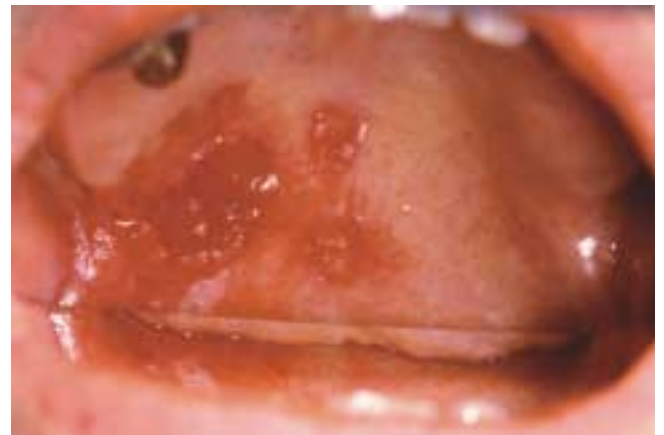


Your best course of action would be:

- A.** Conduct a complete examination of pertinent sun-exposed areas.
- B.** Arrange a biopsy of the apparent site of recurrence and other suspicious areas of the lower lip.
- C.** Arrange a biopsy of suspicious areas of the upper and lower lips.
- D.** Caution the patient to protect himself from sun exposure by wearing a hat, minimizing the time spent in the sun, and using sunscreens and lubricants to protect his skin and lips.

CLINICAL CASE 5

A 56-year-old female makes her annual dental visit and has no chief dental complaint. During the clinical examination that includes palpation of her neck, she states that she recently noticed a change in her voice and thus has reduced her smoking to 10 to 12 cigarettes a day. The patient has smoked since her teenage years and states that she only drinks one or two cocktails on week-ends. She admits to occasionally having one or two glasses of wine with meals during the week. The oral examination reveals extensive, multiple, coalescing, erythematous, granular plaques on the right hard and soft palate. A few non-wipeable white areas can be found, creating a clinical picture of mildly speckled erythroplasia.



Your approach to treating the patient's oral lesion should be:

- A.** Arrange for immediate biopsy of the palate and consultation for an oropharyngeal examination for her recent voice change.
- B.** Remind the patient that smoking and drinking are linked to oral carcinoma and perform the necessary dental treatment; place her on anti-infective therapy, and advise her to return for evaluation in 7-10 days.
- C.** Advise the patient to stop smoking and limit or eliminate her alcohol intake, and direct her to information on how to quit smoking.

CLINICAL CASE 6

A 42-year-old Caucasian female visits a dental laboratory for a new maxillary partial denture. Shortly after the denture is inserted, the patient notices a mass in the neck and goes to a medical clinic for an evaluation, where she is given antibiotics and told to return in two weeks if the mass has not disappeared. Within a few weeks, she notices that her new denture no longer fits as well and decides to visit her family dentist for her normal biannual visit. When questioned about the mass in her neck, the patient states that it does not bother her and that she was given antibiotics but has not yet had time to return to the medical clinic for reassessment. The oral examination reveals a firm unilateral enlargement left of the midline on the hard palate, and the new denture does not seat completely. Palpation of the neck reveals a rubbery, firm, painless mass on the left side of the neck.

The best course of action for the dentist would be:

- A.** Adjust the denture and refer the patient back to the medical clinic for re-evaluation of the neck mass.
- B.** Arrange a biopsy of the palate and initiate a written referral to the oncologist, supplying the biopsy results of the oral lesion as quickly as they can be obtained.
- C.** Make a new denture and advise the patient to return to the medical clinic for reassessment of the neck mass.

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TALKING ABOUT ORAL CANCER

Adapting Your Approach to Patients' Needs

BY PIERRE BOISVERT, D.M.D.

Oral cancer screening is a unique opportunity for dentists to renew the bond of trust with their patients. By taking the proper approach and using simple terms, you can tell patients all they need to know without alarming them.

In 2003, the National Cancer Institute of Canada estimated that there were 3,100 new cases of oral cancer nationwide, including 730 in Quebec, and 1,100 deaths due to cancer, 295 of them in Quebec.¹

Only about one-third (35%) of oral cancers are diagnosed in the early stages, when they are most curable. Yet many authors agree that early detection is the most critical intervention influencing patient survival.^{2,3}

Dentists can play a decisive role in patients' lives by making oral cancer screening a regular part of their practices. This will give them a chance to talk to their patients about this health issue and provide them with the information they need. Since dentists are not necessarily accustomed to providing counselling services as part of their job,⁴ the challenge is to bring the dental team together in an approach designed to provide simple information for patients at each step in the screening process.

EVALUATION OF THE PATIENT'S HEALTH AND CLINICAL EVALUATION

Evaluating the patient's general health and lifestyle is an integral part of a complete dental examination. Before asking the patient any questions, you should take a few minutes to explain why you are gathering this information. The questionnaire should ask about the patient's general health, previous hospitalizations, current medications, risk factors including drinking and smoking, dietary patterns, lifestyle and family cancer antecedents, including the appearance or remission of any other cancer.⁵

Then conduct a clinical examination of the patient's head, neck and mouth. The patient will probably consider the oral examination a normal procedure, but may be surprised when you manipulate his head and neck. It is best to explain the parts of a clinical examination and mention that this is a normal step in evaluating the hard and soft tissues of the oral cavity.

STRAIGHTFORWARD ANSWERS

Members of the dental team have a crucial role to play in providing accurate, easily understandable information. They must be prepared to speak to patients using simple language. Here is a list of the most frequently asked questions and suggested answers, adapted from a British Dental Association paper.⁶

Q. What is oral cancer screening?

A. It is a procedure that lets us find a cancer early on, even before symptoms appear.

Q. Why are you doing this kind of examination now?

A. Dentists always examine the tissues in your mouth. But people need to know more about oral cancer, and dentists are well placed to provide information and explain the importance of screening examinations.

Q. What is oral cancer?

A. It is cancer that can occur at several places in the mouth, for instance on the tongue, lips, salivary glands, palate, etc. Most cancers appear as an ulcer that doesn't heal normally and lasts longer than two weeks, a small lump or, more rarely, a whitish or reddish patch.

Q. What are the risks of developing this kind of cancer?

A. People most at risk of developing oral cancer are men age 45 and over, especially if they are smokers and regular heavy drinkers. There are other risk factors, such as diet and lifestyle. The screening examination we are doing today is to make sure you don't have oral cancer.

Q. Can it kill people?

A. Yes, as can all cancers. This is why screening examinations are so important. The chance of being cured is four times greater, with much less serious side effects, if the cancer is discovered early on.

Q. How can I avoid getting oral cancer?

A. Don't smoke or chew tobacco and drink in moderation. Maintain a healthy diet, including fresh fruit and vegetables. It is also a good idea to examine your own mouth regularly and ask your dentist to do so when you come in for your routine examination.

WHAT TO DO IF YOU SUSPECT CANCER

Some dentists prefer to refer their patient to a specialist physician or dentist if they suspect oral cancer. The most important thing is to reassure the patient, telling him that this is just a necessary precaution. Other dentists are comfortable conducting such diagnostic tests as a biopsy, a cytobrush specimen, a toluidine blue test or exfoliative cytology. Before doing any tests, however, you must explain to the patient what you are doing and obtain his consent. You must also tell him how long it may take to obtain the results, if tissue samples are to be analyzed outside your practice. If the patient asks what will happen next, you must explain that you will be collaborating with specialists who will perform laboratory tests to arrive at a diagnosis. The patient will be reassured to know that he will be referred to a skilled medical or dental team, if necessary, and that his case will be handled as quickly as possible.

ORAL CANCER SCREENING CAN REDUCE THE NUMBER OF DEATHS FROM THIS DISEASE AND HAVE A POSITIVE IMPACT ON THE PUBLIC'S PERCEPTION OF THE DENTAL PROFESSION.

If a patient is diagnosed with cancer, you must tell him so in clear language, but gently. At this point, it is important for the specialist to discuss the different possible interventions with the patient, i.e. radiotherapy, oncological surgery or chemotherapy (see *Therapeutic Modalities for Oral Cancer, Preparing Patients and Managing Side Effects*, page 32).

Finally, insofar as possible, dental practices should provide patients with written information on risk factors and symptoms to watch for when doing self-examinations of the mouth, in particular (see the box).

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Oral cancer: Symptoms to watch for

- A sore on the lip or in the mouth, like an ulcer, that lasts longer than two weeks.
- A lump on the lip or in the mouth or throat.
- A white or red patch on the gums, tongue or edge of the lip.
- Unusual bleeding, numbness of the tongue, lip or face.
- A change in the voice, a sore throat that doesn't go away or a feeling that something is caught in the throat.
- Difficulty or pain with chewing or swallowing.
- Swelling of the jaw that causes dentures to fit poorly.

Source: Adapted from National Institutes of Health – National Cancer Institute, *What you need to know about oral cancer*, November 1996.

Summary of professional and ethical requirements

- Before completing the medical questionnaire, you should explain to the patient why you are gathering this information.
- Before beginning the clinical examination, especially of the head and neck, explain to the patient why you are doing it.
- Oral cancer screening will become an integral part of routine clinical examinations, just as screening for periodontal disease did in the early 1970s. The *Code of ethics of dentists* states that dentists must promote measures of education and information in the field in which they practise. They must also do what is required to ensure such education and information (s. 2.03).
- Before performing a diagnostic test, e.g. a biopsy, taking a cytobrush specimen or performing a toluidine blue test, you must explain the procedure to the patient and obtain his consent.

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Dentists' Role in Helping Patients Quit Smoking

By PIERRE CORBEIL, D.D.S., M.Sc.

Tobacco, whether it is smoked or chewed, has alarming effects on oral health. It causes oral and pharyngeal cancer and, in the United States, is responsible for more than 75% of deaths caused by these malignancies.¹

Aside from these cancers, about 50% of cases of periodontitis may be attributed to smoking.² It reduces the chances of success of periodontal treatment and impairs oral wound healing. Finally, studies have shown that tobacco use is by far the main factor in the failure of implant therapy treatment, as it impedes the initial and long-term success of implants.^{3,4}

In light of these data, dentists have to feel concerned about the devastating effects of smoking. They have an obligation and a duty to join the battle. All dentists should speak to smoking patients in their practice and consider this an essential part of quality oral care. Evaluating the patient's smoking habits must be an integral part of each diagnosis and dental treatment plan.

The Quebec Ministère de la Santé et des Services sociaux has made smoking one of the main targets of its 2003-2012 public health program. To support smokers in their efforts to quit, the MSSS created the *Plan québécois de lutte contre le tabagisme 2001-2005*, setting out the framework for an integrated umbrella organization of regional and province-wide services. This new strategy is intended to encourage professionals to systematically identify smokers among patients in private clinics, CLSCs and in hospital settings, and offer three to ten minutes of counselling.⁵ This is an area where dentists and their staff, dental hygienists in particular, can make a valuable and necessary contribution.

TALKING WITH SMOKERS

Dentists must systematically evaluate their patients' past and current status as smokers and determine how many cigarettes they smoke daily, and record this information in the patient's file at every visit. They must pay particular attention to young people and evaluate their status, since they are taking up smoking at an increasingly early age—some as young as nine.^{6,7} Dentists must also pay special attention to pregnant women, given the harmful effects of smoking on the foetus.

One study showed that close to 60% of dentists feel that their patients do not want or expect to receive counselling on smoking, whereas 60% of patients feel that dentists should offer such a service.⁸ In addition, research has found that people go through different stages before adopting a new behaviour,⁹ so dentists must tailor their interventions to the smoker's stage (**Table 1**). The goal of the intervention is to help smokers move from one stage to the next and finally make an effort to quit.

Dentists' counselling falls into three categories: a minimal intervention, lasting one to three minutes; a brief intervention, lasting three to ten minutes; and a complete or intensive intervention.

ONE STUDY SHOWED THAT 60% OF PATIENTS FEEL THAT DENTISTS SHOULD OFFER COUNSELLING ON SMOKING.

A minimal intervention includes four steps: evaluating the patient's tobacco use; determining the stage of change; urging the patient to quit smoking and giving him the appropriate documentation; finally, referring him to the support services, if appropriate.

A brief intervention includes the minimal intervention steps, in addition to evaluating the patient's motivation to quit smoking, and offering advice to inform and help him, tailored to his stage of change.

A complete or intensive intervention is generally given at a quit-smoking centre (see page 31) or by experts who can spend more than ten minutes on the intervention. It includes all the steps in the brief intervention, in addition to evaluating the patient's smoking habits and lifestyle, talking about previous attempts to change and offering support tailored to the person's stage of change.

Dentists should conduct minimal or brief interventions with all smoking patients, in keeping with the above guidelines.

MINIMAL INTERVENTION

Precontemplation

Urge the patient to think about the possibility of quitting, and clearly express your concern regarding his tobacco use. You may refer the patient to support services, as appropriate, in particular the toll-free smokers' helpline or a quit-smoking centre.

Contemplation

At this point, your goal is to help the smoker decide to quit. Ask him to identify the pros and cons of such a decision, express your confidence in his ability to quit, encourage him to start with small steps and suggest that he use the support services available.

Preparation

At this step, the patient plans to stop within the coming month. Encourage him to stick to his decision.

Action

This is the most difficult period of all for patients who have quit smoking for less than two weeks. They have to deal with withdrawal symptoms and a strong desire to smoke. It is important to be very attentive, particularly by talking about the patient's symptoms, encouraging him to persevere and referring him to support services as appropriate.

Maintenance

The patient has quit smoking for longer than two weeks. Your role is to help him remain a non-smoker and encourage him to persevere, considering how far he has come already.

BRIEF INTERVENTION

Precontemplation

At this stage, your role is to encourage the patient to compare the so-called benefits of tobacco, such as stress management, mood control and weight control, with the drawbacks—including the effects on general health (average reduction of 15 years in life expectancy)⁵, oral health and the health of those around them, as well as the enormous cost for him and the society. This approach is designed to get the smoker thinking about changing.

Contemplation

Your role here is to help the patient decide to quit smoking, and to counsel him on his concerns about quitting, especially weight gain and added stress, and on the benefits of quitting, in terms of health, a sense of freedom and on the patient's finances.

Preparation

At this stage, your role is to prepare the patient to quit smoking and to act. You can suggest that the patient keep a daily log of his behaviour. Talk with him about any worries that are keeping him from quitting, and discuss withdrawal symptoms and the likelihood that he will have strong urges to smoke. You may

TABLE I Stages of change in a smoker's behaviour

STAGES OF CHANGE	CHARACTERISTICS OF SMOKING PATIENTS
Precontemplation: 50% to 60% of smokers	The patient does not see tobacco use as a problem, and has no intention of quitting.
Contemplation: 30% to 40% of smokers	The patient is aware that smoking is a problem and is thinking about it. He would like to quit, but has not yet set a date.
Preparation: 10% to 15% of smokers	The patient is preparing to quit smoking within the next month.
Action	The patient quit smoking less than two weeks ago. He is coping with the problems that go along with quitting, i.e. withdrawal symptoms, strong urges to smoke, cues that would normally have him reaching for a cigarette, etc.
Maintenance	The patient has not smoked for over two weeks, and is pursuing his efforts to remain a non-smoker.

Taken and adapted from Prochaska, Norcross, Di Clemente.⁹

Why stop smoking?

- Smoking is the leading preventable cause of morbidity and mortality in North America. It is responsible for the premature deaths of some 45,000 Canadians, including 12,000 in Quebec, every year.¹⁰
- Smoking by pregnant women is associated with increased complications, such as delayed foetal growth, premature births, perinatal mortality and sudden infant death syndrome.¹¹
- Despite all the anti-smoking campaigns, the number of smokers remains very high in Quebec and across Canada. In 2002, for example, 26% of Quebecers age 12 and up were smokers (28% of men and 24% of women).¹²

provide information on nicotine replacement therapies. It is a good idea to set a "quit date" with the smoker and offer to follow up for one or two weeks afterward.

Action and maintenance

At these two stages in behaviour change, your role is to help the patient remain a non-smoker. Congratulate him, talk about when he finds it most difficult and the risk of relapse (it may take five to seven attempts to quit smoking) and encourage him to persevere. If the patient starts smoking again, you should try to help rid him of any sense of guilt and continue to encourage him to quit. Suggest that the patient start over again with the behaviour change process.

AN ESSENTIAL CONTRIBUTION

All forms of tobacco use have repercussions on patients' oral health and a considerable impact on the prognosis for dental treatment, not to mention on the lives of patients with oral cancer. When a patient entrusts his oral health to a dentist, the dentist must feel a commitment. The patient's tobacco use is not a simple personal matter, since it affects the dentist's professional responsibility. All dentists must join with other health professionals to promote and sustain the battle against smoking. They have an essential contribution to make.

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Free Resources for Help with Quitting Smoking

According to the findings of the Canadian Tobacco Use Monitoring Survey (2002), some 426,500 Quebecers hope to stop smoking in the next six months. But they will need help if they are to succeed. That is why the Ministère de la Santé et des Services sociaux, in collaboration with the health and social services network, the Conseil québécois sur le tabac et la santé and the Canadian Cancer Society, has provided three free tools to help people who want to butt out.

A NATIONAL TOLL-FREE TELEPHONE LINE: 1 888 853-6666

Smokers can talk to an expert and get help to keep them on track in their efforts to quit. The help line offers tools and services geared to their needs:

- information and documentation;
- on-the-spot or in-depth counselling and intensive support;
- referral to other services, in particular local quit-smoking centres.

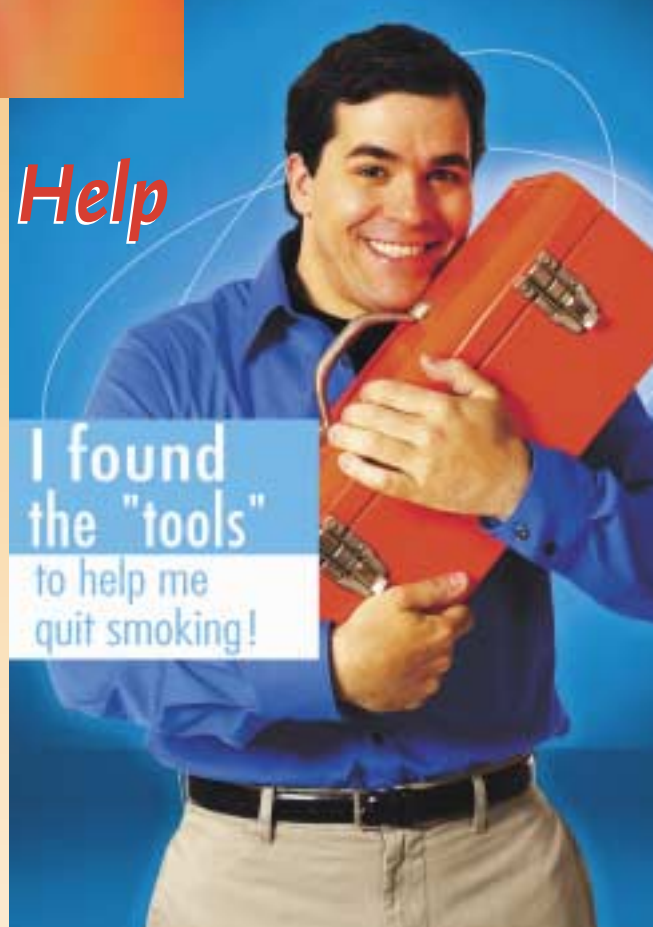
THE [WWW.JARRETE.QC.CA](http://www.jarrete.qc.ca) WEBSITE

This interactive gateway site has all sorts of on-line and video services to help smokers quit, along with a chat room, a mutual support forum and a list of quit-smoking centres. One part of the site is designed specifically for teens.

QUIT-SMOKING CENTRES

A quit-smoking centre offers a range of free, customized services to help smokers kick the habit. Most such centres are located in CLSCs. The services are provided by health and social services professionals or other specially trained experts. Services include:

- information and documentation;
- on-the-spot or in-depth counselling and intensive support (by telephone or in person, individual or group meetings);
- referral to other services.



Useful links

www.jarrete.qc.ca

www.allumelagang.com

www.defitabac.qc.ca

www.cancer.ca

www.cqts.qc.ca

www.msss.gouv.qc.ca



Therapeutic Modalities for Oral Cancer, Preparing Patients and Managing Side Effects

BY MICHEL MAURIS, D.M.D., AND GASTON BERNIER, D.M.D.

The detection of malignant tumours, preparation for medical treatment, management of side effects and post-therapeutic follow-up all have far-reaching repercussions on patients' oral health. Thanks to advances in oncology and, in particular, chemotherapy, the five-year survival rate for oral cancer patients might reach 65%. In spite of this encouraging trend, morbidity remains high.^{1,2,3,4,5}

Patients diagnosed with oral cancer at an early stage in the disease have fewer post-treatment sequelae.⁶ Those diagnosed at an advanced stage, on the other hand, also require care to help them cope with a wide range of serious complications, from difficulty chewing and speaking to dryness of the mouth and problems related to surgical excision of an anatomic structure of the mouth or face. They may also suffer a serious loss of self-esteem, especially since oral cancer is prevalent among smokers and heavy drinkers, already vulnerable in this regard.

THERAPEUTIC MODALITIES FOR ORAL CANCER

To determine the extent or stage of a cancer, the attending oncologist and the multidisciplinary team rely on clinical examination, medical imaging (radiography, computerized tomography, magnetic resonance imaging, scintigraphy) and biochemical and genetic testing. The T.N.M. classification (T.N.M. stands for tumour,

node, metastasis) is used to assess the stage of the cancerous tumour and guide the choice of therapeutic modalities, i.e. surgery, radiotherapy or chemotherapy. Diagnostic parameters of the T.N.M. classification are:

- T: the size of the tumour (e.g.: T₁ = tumour measuring 1 cm).
- N: the number of lymph nodes to which cancerous cells have spread.
- M: areas where cancerous cells have spread from the primary cancer and formed distant metastases.

For each histological tumour type, its location and spread correspond to a specific treatment that takes account of expected outcomes and the risks associated with the treatment. The most common therapeutic modalities for oral cancer are surgery and radiotherapy. Chemotherapy alone is rarely used; a combination of radiotherapy and chemotherapy is more frequent for advanced stages.

Surgery

Surgical intervention is often the first step in treating oral cancer (Figure 1), depending on the location and type of tumour. The preferred approach is complete excision of the tumour and surrounding tissues. During the surgery, the tissues are sent to a pathology laboratory for analysis, so as to eliminate as much cancer-bearing tissue as possible. After a recovery period of about three weeks, the patient is normally sent to radio-oncology for complementary irradiation.



FIGURE 1: Maxillectomy

Radiation therapy

Radiation therapy, or radiotherapy, involves using ionizing radiation to alter the genetic material of cancerous cells, then provoking their necrosis (**Figure 2**). There are two types of irradiation, i.e. external radiotherapy, or teletherapy, using high-intensity radiation; and interstitial radiotherapy, or brachytherapy. For external radiotherapy, a beam of ionizing radiation is administered from a distance. When it is focused on a specific site in high doses, the radiation destroys cancerous cells. Interstitial therapy is the implantation *in situ* of a radioactive source that directly irradiates the tumour from the inside. The amount of tissue to be irradiated depends on the type of tumour, its location and lymph node drainage.



FIGURE 2: External radiation apparatus

Dentists must know the field of irradiation, the amount of tissue affected and the radiation dose prescribed by the oncologist for tumours of the oral cavity and ORL sphere (**Figure 3**). These biometric data should be noted in the patient's file, so as to have any pretreatment oral and dental work done and for later evaluation of any surgical procedure in the irradiated fields.

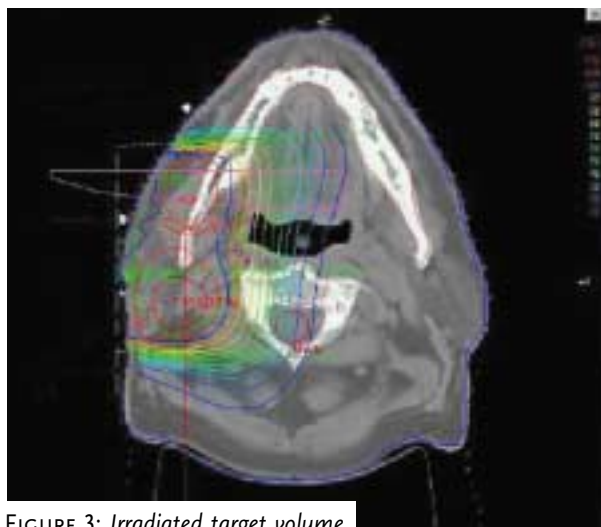


FIGURE 3: Irradiated target volume

Chemotherapy and its complications

Chemotherapy involves systemically administering drugs with cytotoxic properties that attack the cancerous cells. The use of chemotherapy alone for frank oral lesions is reserved for rare tumours.⁷ In the past ten years or so, however, a combination of radiotherapy and chemotherapy has been used to treat a number of tumours considered inoperable or for palliative purposes. Chemotherapy is routinely used for some ORL manifestations of Hodgkin's disease and non-Hodgkin's lymphoma.

Chemotherapy also affects healthy tissue. The marked decline in immune response among patients following a course of chemotherapy is an important consideration in planning dental treatment.⁸ Mucositis, or stomatitis, is one of the main complications of chemotherapy, a painful affection that can interfere with chewing and swallowing. Its severity depends on the patient's oral hygiene or his dentures, his medical treatments and age. Often a toothbrush with ultra-soft bristles must be used if this affection results in extreme sensitivity.

ORAL AND DENTAL PREPARATION AND MANAGING SIDE EFFECTS OF RADIOTHERAPY

Exposing the buccal and peribuccal tissues to strong doses of radiation causes numerous changes that dentists must take into account before the radio-oncologist begins treatment. Dentists must treat any underlying problem such as dental caries, defective restorations, poor oral hygiene, uncontrolled periodontal disease, ill-fitting dentures or an odontogenic infection. All patients must undergo a comprehensive dental examination and be classified according to their oral health status (**Table 1**, next page). This approach is intended to eliminate any potential source of infection and stabilize the patient's medium- and long-term oral and dental health.

During radiotherapy treatments, affections such as mucositis or stomatitis, xerostomia, dysgeusia, mycosis, muscular fibrosis and trismus are frequently observed. They call for rapid therapeutic intervention to prevent lesions from appearing.

TABLE 1 Classification of patients prior to radiotherapy

CLASS	DETAILS	INTERVENTION BEFORE RADIOTHERAPY
Edentate at clinical examination	Radiological examination may show presence of residual roots, granuloma or cysts	Elimination of any symptomatic lesions Preparation of edentate ridges for dentures, once radiotherapy is completed
Mediocre oral health	Extensive caries calling for complex restorations Several defective restorations Presence of chronic periapical lesions Periodontopathy	Extraction of non-restorable teeth; conservative care (restoration dentistry and endodontics) Teeth in the irradiation field are treated first Practitioner must use clinical judgment in prescribing these extractions Restoration dentistry and endodontics are applied to teeth where periodontics allows, depending on the practitioner's clinical judgment Fluoridation of remaining teeth
Acceptable oral health	Remaining teeth may be restored with normal procedures (conservative treatment) Minimal local factors Periodontal pockets are smaller than 4 mm, and 50% of the bony support is still present Restorations are of dubious to acceptable quality	Extraction of teeth in the irradiation field that cannot be treated endodontically Restoration of remaining teeth using conventional techniques Fabrication of custom-fitted tray and fluoridation
Very good oral health	No major malocclusions and very good oral hygiene Presence of some shallow carious lesions Restorations are adequate No active periodontal disease and bony supports within normal limits	Periodontal examination No extraction Restoration of carious lesions Fabrication of custom-fitted tray and fluoridation

Taken and adapted from Daly and Drane.⁹

Mucositis and dysgeusia

Ionizing radiation causes inflammation of the oral mucosa, manifesting as redness of the tissues and a burning sensation, i.e. mucositis or stomatitis. Dysgeusia is the loss of the sense of taste linked to this inflammatory process. Mucositis symptoms may be

exacerbated by xerostomia and fungal infections such as *candida albicans*. The use of certain drugs, including *Sulcrate*, an isotonic saline solution or sodium bicarbonate and antifungal agents may mitigate the effects of mucositis, thereby alleviating the patient's discomfort and preventing dysphagia (Table 2).

TABLE 2 Medication for treating complications due to radiotherapy of the head and neck

TREATMENT	DOSE	CONTRAINDICATIONS
Systemic sialogogue		
Pilocarpine, 5 mg	3-6 tabs daily	Asthma, glaucoma, liver dysfunction
Anethole dithiolethione, 25 mg	1 tab, 3 times daily	Hypersensitivity
Topical antifungal		
Nystatin suspension, 100,000 U/ml	5-10 ml, rinse, then spit, 3 times daily	Other topical medications
Nystatin cream or ointment, 100,000 U/g	Apply to dry denture surface, 3 times daily	Hypersensitivity to drug class
Clotrimazole cream, 1%	Apply to dry denture surface, 3 times daily	Hypersensitivity to drug class
Clotrimazole troches, 10%	Dissolve in mouth, 5 times daily for 14 days	Hypersensitivity to drug class Liver dysfunction
Ketoconazole, 200 mg	1 or 2 tabs by mouth, 4 times daily	Liver dysfunction
Chlorhexidine rinse 0.12%	5-10 ml, rinse > 1 minute, then spit, 3 times daily	Hypersensitivity to drug class
Mucosal coating agents		
Milk of magnesia – Maalox	15-30 ml by mouth, 4 times daily, as needed	Hypersensitivity to drug class Kidney dysfunction
Sucralfate, 1 g/10 ml	5-10 ml, 4 times daily. Rinse > 1 minute, then spit	Hypersensitivity to drug class Kidney dysfunction
Topical anesthetics or analgesics		
Benzylamine hydrochloride	5 ml, as needed. Rinse > 1 minute, then spit	Hypersensitivity to drug class
Viscous lidocaine, 4%	5 ml, as needed. Rinse > 1 minute, then spit	Hypersensitivity to drug class Liver dysfunction
Sucralfate, 1g/10 ml	5-10 ml, 4 times daily. Rinse > 1 minute, then spit or swallow	Hypersensitivity to drug class Kidney dysfunction

Adapted from Hancock, Epstein, Sadler.¹⁰

Xerostomia

Dentists must watch for clinical signs and symptoms of xerostomia, such as a dry feeling, a burning sensation in the mouth and lips and difficulty wearing dentures. Ionizing radiation causes necrosis and fibrosis of the major and minor salivary gland acini, thereby reducing saliva secretions. Caries due to xerostomia or radiation caries (**Figure 4**) are another side effect of radiotherapy, caused by the rapid demineralization of the smooth surfaces of teeth, and occur in a few weeks under the combined effects of cariogenic factors and the loss of the buffering action of saliva.



FIGURE 4: Radiation caries

During radiotherapy, it is essential that patients follow a strict oral hygiene regimen: brushing their teeth after every meal, flossing daily and applying fluoride with neutral pH. They may use children's toothpaste to avoid hypersensitive mucosa (burning sensation). Alcohol-based mouthwash is contraindicated. If one or more major salivary glands are in the radiation field, the patient must receive daily topical applications of fluoride using a custom-fitted vinyl tray, for as long as the xerostomia persists. If the xerostomia is a lasting sequela of irradiation, the patient must plan on applying fluoride regularly on a permanent basis. It is essential that fluoride solutions have a neutral pH, otherwise the patient will abandon the treatment, for some solutions can cause a burning sensation in the gums and mucosa.

Systemic sialagogues may be used as salivary substitutes or to stimulate production of natural saliva. The former have only a temporary effect and should be prescribed only for patients for whom pilocarpine (*Salagen*) is contraindicated. Salivary stimulants are especially useful in reducing xerostomia. Some,

such as pilocarpine, are fairly effective; others, such as anethole dithiolethione (*Sialor*), are less so.^{11,12}

There may be an inflammatory reaction of muscles in the irradiation zone, producing a spasmodic reaction and a temporary limitation of opening for the mouth. When strong doses of radiation are used, trismus may sometimes cause fibrosis of certain muscles, with permanent consequences. Jaw exercises are recommended in such cases.

Osteoradionecrosis

Osteoradionecrosis is the devitalization of irradiated bone. This process arises from inflammation of vascular channels, causing proliferative endarteritis, in turn limiting the vascularization of bony tissue and making it hypocellular and hypoxic. The bone tissue becomes fragile, and sequestra (fragments of devitalized bone) may detach from the jaws spontaneously or following trauma that overwhelms the tissue's reparative capacity, for instance a dental extraction. The evolution of osteoradionecrosis varies from a tiny spicule measuring only a few millimetres to a sequestrum requiring a major resection of the jaws, with serious impact on the ability to chew.¹³

Osteoradionecrosis is treated by eliminating the sequestrum in the least traumatic way possible and prescribing hyperbaric therapy (**Figure 5**), i.e. by exposing the patient to high-pressure oxygen so as to encourage the regeneration of capillaries at the necrotized site. The treatment is given in pressurized chambers, where several patients can be treated at once, or in one- or two-person units. This therapy consists of protocols lasting several consecutive days, under the supervision of a physician who monitors pulmonary reactions. The posterior mandibular area is the maxillary region most often affected by osteoradionecrosis, since it is irrigated by a single arterial branch.



FIGURE 5: Single-person hyperbaric chamber

Following radiotherapy, dentists must monitor their patients closely for side effects of xerostomia and neoplastic recurrences. It is not unusual for patients who have stopped smoking following a diagnosis of cancer to compensate by consuming large amounts of candy and other cariogenic foods. Even if they were properly prepared for treatment, it is important to ensure that the teeth retain their integrity, so that no extractions will be necessary from irradiated bone. Osteoradionecrosis can be highly debilitating and may require surgery or restorative treatment, for instance for maxillo-facial prostheses, a very lengthy process.

Cancers of the oral cavity and the ORL sphere have a serious impact on patients' lives. It is essential for dentists and attending oncologists to pool their expertise in order to prevent or reduce the complications and sequelae of treatments.

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Dealing with Patients Who May Have Oral Cancer

By RENÉ LAROUCHE, D.M.D., M.Sc.

Every year, more than 700 new cases of oral and pharyngeal cancer are reported and recorded in the Quebec Tumour File (Fichier des tumeurs du Québec).¹ A dentist is as likely to detect this type of cancer in a man as a physician is to detect stomach cancer or leukemia.¹ In other words, all dentists must be prepared for this eventuality.

Any referral to a specialist is stressful for a patient, all the more so if it is intended to confirm the presence of oral cancer. Nevertheless, having a clearly defined procedure is a good way to reduce the patient's anxiety and worry, and waiting time as well. Many dentists have their own networks of specialists—a maxillo-facial surgeon, an oral medicine specialist, an oral pathologist or an otorhinolaryngologist, for example—whom they call on in such circumstances. Otherwise, the dentist can always contact a health and social services radio-oncology centre (see list).

REFERRING AND FOLLOWING UP ON THE PATIENT

Dentists must make opportunistic screening of patients at risk for oral cancer an integral part of their practice. As soon as you observe a suspicious area or lesion, you must conduct an intraoral and extraoral examination. Then, if you are comfortable making diagnostic tests, conduct a toluidine blue test or take a specimen with a cytobrush or other diagnostic tool (see *Oral Cancer Examination – The Best Way to Screen for Oral Cancer*, page 12). Note, however, that these tests are simply a preliminary step, for a biopsy remains the only way to make an initial diagnosis of oral cancer. You should also consider having these tests done in a hospital, for patients who cannot afford them. It is essential, naturally, that a patient who may have oral cancer be referred as quickly as possible so that the initial diagnosis can be confirmed.

Before the patient leaves your office, immediately call a specialist and make an appointment, then give the patient the referral slip. If you cannot reach the specialist, reassure the patient and tell him you will call him with the date as soon as you have made an appointment. If necessary, you can fax your request for an appointment to the specialist so that he can assess the urgency of the case. In your letter to the specialist, give:

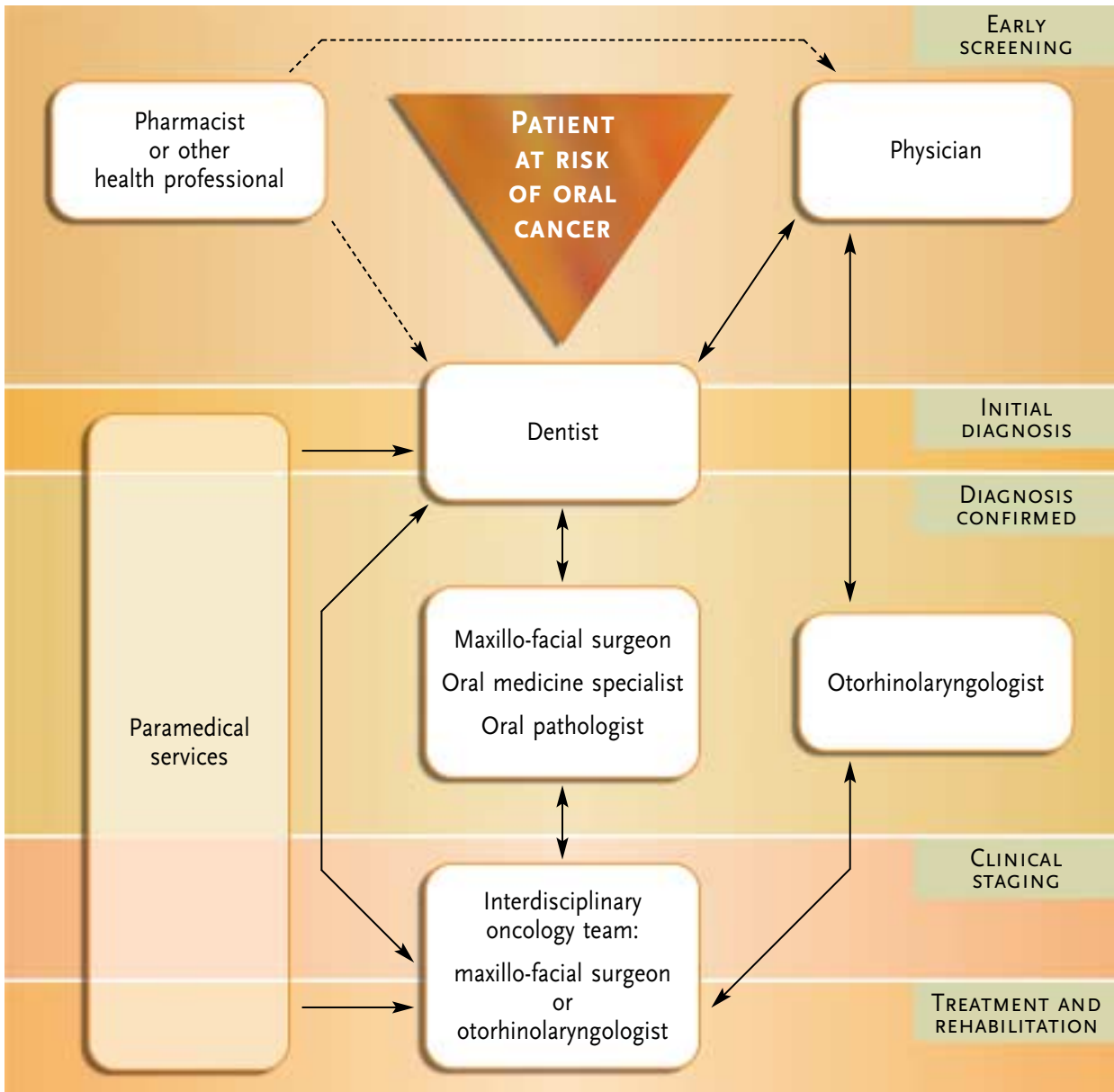
- Patient's personal details (first and last names, address, sex, date of birth, date file opened and other pertinent information such as occupation, ethnic origin, etc.);
- Dental consultation or reason for the visit;
- Dental history (frequency of visits and attendance patterns, oral hygiene, periodontal condition, etc.);
- Patient health and any precautions in the event of an operation;
- Family history and social background, including any risk factors;
- Details relating to the suspicious area or lesion (colour, texture, size, position, etc.);
- Data from the extraoral examination (palpable lymph nodes, etc.);
- A copy of the dental treatment record, including the mouth map;²
- A copy of the previous dental treatment record, if you have been monitoring the suspicious area or lesion;
- Intraoral photographs of any visible lesion or stained area, if available;
- Results of tests done with toluidine blue or a cytobrush, if available;
- Advice given to the patient and an indication of his understanding of the situation.

If you have no news from the specialist after a reasonable time, contact him to ensure that he has indeed examined the patient. Sometimes a patient will skip an appointment for any number of reasons. For instance, he may be denying the possibility that he has cancer or afraid of finding out. It is estimated that about two-thirds of patients with oral cancer consult a specialist at an advanced stage in the disease, i.e. stage III or IV.³ The prognosis is poor in such cases, since the five-year survival rate for these patients has not improved in the past 30 years.^{3,4,5} It is generally 50% or less, worse than the rate for people with prostate, breast, colorectal, bladder, larynx, uterine and cervical cancer.^{1,4}

Dentists can take a leadership role in combating oral cancer, since they have many different means for detecting the disease at an early stage. However, all front-line caregivers can also contribute to improving patients' chances of survival, since many people do not consult their dentist or physician regularly. Pharmacists, nurses, dental hygienists, denturologists and any other health professional can direct them to a

dentist or physician, who will refer them, if necessary, to the appropriate specialist (maxillo-facial surgeon, oral medicine specialist, oral pathologist or otorhinolaryngologist) by requesting an appointment and following up (Figure 1). It is also recommended, as another prevention tool, that all front-line caregivers assume more responsibility for counselling patients whose behaviours put them at risk.

FIGURE 1 Critical path for a patient who may have oral cancer



LEGEND:

Refer to: ----->

Request for appointment and follow-up: <----->

Request for curative and/or preventive dental care: ----->

AN INTERDISCIPLINARY APPROACH

The professionals in the health and social services network are committed to ensuring continuity of care and support for patients throughout the different stages of cancer. At present, patients can be referred to the appropriate specialists in the network to obtain a confirmation of the diagnosis, including staging.

IT IS CRUCIAL TO ENSURE THE CONTINUITY OF SERVICES AND PATIENT SUPPORT THROUGHOUT THE DIFFERENT STAGES OF ORAL CANCER.

For oral cancer patients, the interdisciplinary oncology team consists of several members, including a maxillo-facial surgeon or an otorhinolaryngologist, who plan the different treatment and rehabilitation phases (**Figure 1**). However, the team may also request curative and/or preventive dental care, since dentistry is an integral part of paramedical services. Radiotherapy of the head and neck can have serious repercussions on the main salivary glands, buccal mucosa and maxillaries, during or following cancer treatment, including xerostomia, dysgeusia, trismus, radiation-induced mucitis, oral candidiasis, dentine hypersensitivity, radiation caries and osteoradionecrosis (see *Therapeutic Modalities for Oral Cancer, Preparing Patients and Managing Side Effects*, page 32). In addition, chemotherapy can cause inflammation and/or infection of the buccal mucosa. Consequently, it is entirely appropriate for dentists to provide curative and/or preventive care for their patients at different stages of cancer.

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List of Radio-oncology Centres in Quebec

REGION 01 – BAS-SAINT-LAURENT

Centre hospitalier régional de Rimouski
150 avenue Rouleau
Rimouski, Quebec
G5L 5T1
(418) 724-8362

REGION 02 – SAGUENAY-LAC-SAINT-JEAN

Complexe hospitalier de la Sagamie
305 avenue Saint-Vallier
Chicoutimi, Quebec
G7H 5H6
(418) 541-1032

REGION 03 – QUÉBEC

Centre hospitalier universitaire de Québec
Hôtel-Dieu de Québec
11 Côte du Palais
Québec, Quebec
G1R 2J6
(418) 691-5264

REGION 04 – MAURICIE ET CENTRE-DU-QUÉBEC

Centre hospitalier régional de Trois-Rivières
Pavillon Sainte-Marie
1991 boulevard du Carmel
Trois-Rivières, Quebec
G8Z 3R9
(819) 697-3333

REGION 05 – ESTRIE

Centre hospitalier universitaire de Sherbrooke
Hôpital Fleurimont
3001 12^e Avenue Nord
Fleurimont, Quebec
J1H 5N4
(819) 346-1110

REGION 06 – MONTRÉAL-CENTRE

Centre hospitalier de l'Université de Montréal
Hôpital Notre-Dame
1560 Sherbrooke East
Montreal, Quebec
H2L 4M1
(514) 890-8254

Centre hospitalier de l'Université de Montréal
Hôtel-Dieu de Montréal
3840 Saint-Urbain
Montreal, Quebec
H2W 1T8
(514) 890-8154

McGill University Health Centre
Montreal General Hospital
1650 Cedar
Montreal, Quebec
H3G 1A4
(514) 934-8040

Jewish General Hospital – Sir Mortimer B. Davis
3755 Côte Sainte-Catherine
Montreal, Quebec
H3T 1E2
(514) 340-8288

Hôpital Maisonneuve-Rosemont
5415 de l'Assomption
Montreal, Quebec
H1T 2M4
(514) 252-3425

REGION 07 – OUTAOUAIS

Centre hospitalier des Vallées de l'Outaouais
Hôpital de Gatineau
909 boulevard La Vérendrye Ouest
Gatineau, Quebec
J8P 7H2
(819) 561-8625

Answers to Case Reports, pages 22 to 25

CLINICAL CASE 1

The answers are B and C



Discussion

Systemic factors should always be a primary consideration when examining a new patient

and taking the history. Even though the patient's vital signs were normal at the time of the visit, the medical history reveals a history of night sweats, malaise and weakness—all signs of systemic disease. In addition, the dentist should always bear in mind that enlarged gingivae might carry important systemic implications, especially when combined with abnormal laboratory findings. In this case, the hospital dentist urgently escorted the patient to the emergency room for an immediate complete blood test that included a differential for blood components. The patient had a white blood count of 164,000 cells/l (normal is 4,800 – 10,800 cells/l), a red blood count of 2,500 cells/l (normal is 4,200 – 5,400 cells/l) and a platelet count of 37,000 cells/l (normal is 130,000 – 400,000 cells/l). The overview is that the patient had an overproduction of abnormal white blood cells that crowded out all other cells, producing a pancytopenia resulting in anemia and thrombocytopenia. The medical diagnosis was acute myelogenous leukemia. At this level of compromise due to the blood dyscrasia, the patient was a true emergency, and any dental manipulation could have resulted in a severe crisis. Neutropenia and thrombocytopenia place these patients at significant risk for even the simplest dental procedure, and the least invasive means of managing additional dental problems is indicated until the hematologist-oncologist has been consulted.

CLINICAL CASE 2

The answer is B



Discussion

It is well established that delay by the patient and the clinician is an important factor in the poor

prognosis of oral cancer. The only acceptable course of action in this case is to emphasize the urgent need for a definitive diagnosis. A biopsy is urgent, since the patient's social history of drinking and smoking places him in a high-risk category for oral cancer, and the lesion meets several ominous clinical criteria—it is indurated, painless, enlarging and has been present for a significant time. More importantly, the lesion is located on the tongue, the location of more than 25% of all oral cancers, and in the anterior two-thirds of the tongue, the site that accounts for 53% of tongue cancers.

CLINICAL CASE 3

The answers are A, B and C



Discussion

Patients are often not co-operative at first when they do not realize the seriousness of the clinical findings.

Often it is fear or mistrust of the doctor. Professional judgment must prevail and expediency is key in managing oral cancer victims. All available tools to obtain an early and accurate diagnosis and gain the patient's confidence must be used. In this case, every effort should have been made at the initial visit to get adequate biopsies of all suspicious areas and appropriate radiograph imaging.

CLINICAL CASE 4

The answers are A, C and D

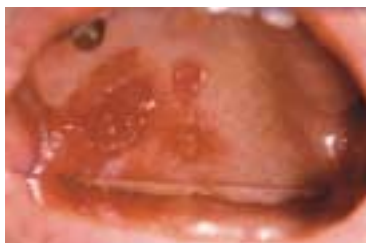


Discussion

The social history of previous environmental exposure and a history of carcinoma of the lip are significant. Although carcinoma of the lip is decreasing in frequency in most of North America, the lip is still one of the top three sites of occurrence following the tongue and oropharynx. The clinical appearance of the lower lip shows troubling crusting with non-healing sites and an indistinct vermilion border. A more complete examination, however, reveals a long-standing circular lesion of the skin above the upper lip that has a raised border, pearl-like in colour with a depressed crusting centre. A complete examination of visible areas of the head and neck and other exposed areas of the body should be a part of the routine dental examination. Although biopsy is an invaluable tool, a biopsy alone may not always reveal the complete diagnosis without proper physical examination and diagnostic skills. The biopsy result of the lower lip was squamous cell carcinoma; however, a biopsy of the skin lesion of the upper lip revealed basal cell carcinoma or, as it is more appropriately called, basal cell epithelioma—a lesion that, although not normally prone to metastasis, may cause severe invasion and disfigurement if not diagnosed early.

CLINICAL CASE 5

The answers are A and C



Discussion

Regardless of age and gender, adult patients who smoke and drink increase their risk of oral cancer. The clinical diagnosis of erythroplasia, that is any persistent oral red area exhibiting recurring erosive changes not attributable to a specific entity or factor such as trauma or infection, is usually, at a minimum, carcinoma *in situ*. This high-risk condition deserves the most urgent possible attention. In addition, with every patient who smokes, it is the obligation of the dental clinician to state his or her opposition to this very addictive and

risky habit and to provide the patient with information on quitting. Smoking and excessive drinking are synergistic factors leading to oropharyngeal carcinoma and should be discouraged. A permanent recent change in voice may be an indication of oropharyngeal carcinoma and deserves immediate attention in patients who smoke and drink. The ominous clinical appearance of the mucosa combined with the social history of drinking and smoking indicate a need for counselling and immediate biopsy. The biopsy of the palate showed invasive squamous cell carcinoma, and oropharyngeal involvement was revealed on more extensive biopsy.

CLINICAL CASE 6

The answer is B



Discussion

A key component of the clinical examination of dental patients is palpation of the neck. Most non-tender masses in the neck, provided they are anatomically distinct from the thyroid and major salivary glands, are benign lymphoid hyperplasias. However, if a non-tender mass is firm and rubbery, as in lymphoma, or hard and bony, as in secondary carcinoma, immediate and persistent evaluation and treatment are indicated. Unfortunately, many patients with undiagnosed cancer of the head and neck are initially treated with antibiotics rather than given an early, competent clinical examination that would avoid a delay in diagnosis. A useful and well-established clinical rule regarding swellings on the hard palate is that an indurated swelling off the midline is a neoplasm until proven otherwise. In this case, the above clinical findings combined with the history of increased rapid growth of the oral painless palatal lesion and the lack of response of the neck mass to antibiotics point toward malignancy, and the patient should be quickly referred to an oncologist with as much clinical information as can be obtained.

Test Your Knowledge

The Ordre des dentistes du Québec offers all its members a chance to earn two continuing education credit-hours, if they correctly answer the following questions. In keeping with its policy on continuing education in dentistry, the Order grants this number of hours for self-directed study activities. Each section of

the questionnaire covers one of the topics in the supplement. Circle a single answer per question **on the tear-out sheet on page 46**, and mail the sheet to the Direction des services professionnels, Ordre des dentistes du Québec, 625 René-Lévesque Blvd. West, 15th floor, Montreal, Quebec H3B 1R2, or fax it to (514) 393-9248.

THE EPIDEMIOLOGY AND ETIOLOGY OF ORAL AND PHARYNGEAL CANCERS IN CANADA AND QUEBEC (page 6)

- 1** What is the most common anatomic site for oral and pharyngeal cancers?
 - a. Oropharynx
 - b. Tongue
 - c. Salivary glands
 - d. Floor of the mouth
- 2** What is the most commonly observed histological type of oral or pharyngeal cancer?
 - a. Lymphoma
 - b. Basocellular carcinoma
 - c. Ameloblastoma
 - d. Squamous cell carcinoma
- 3** Which of the following factors is not definitely recognized as an etiological factor in oral or pharyngeal cancer?
 - a. Exposure to sunshine
 - b. Human papillomavirus
 - c. Tobacco
 - d. Heavy drinking
- 4** Which of the following factors cannot predict the survival of an oral or pharyngeal cancer patient?
 - a. Alcohol consumption
 - b. Sex
 - c. Disease stage at diagnosis
 - d. Site of the disease

CLINICAL MANIFESTATIONS OF ORAL CANCER (page 16)

- 5** Which of the following premalignant lesions is most likely to transform into squamous cell carcinoma?
 - a. Actinic cheilitis
 - b. Nodular leukoplakia
 - c. Erythroleukoplakia
 - d. Proliferative verrucous leukoplakia
- 6** Which of the following statements does not apply to floor-of-mouth squamous cell cancer?
 - a. It is the second most common type of oral cancer, after cancer of the tongue.
 - b. It generally begins as a leukoplakia, erythroplakia or erythroleukoplakia.
 - c. It generally develops in the posterior part of the floor of the mouth, near the base of the tongue.
 - d. Of all oral cancers, it is the most closely linked to alcohol consumption.
- 7** Which of the following statements does not apply to squamous cell cancer of the soft palate?
 - a. It is much rarer than cancer of the hard palate.
 - b. It is often observed in the lateral portion of the palate.
 - c. It tends to infiltrate the tonsillar region, and even the adjacent part of the tongue and floor of the mouth.
 - d. The prognosis for this cancer is poorer than for cancer of the lip and buccal mucosa.

TALKING ABOUT ORAL CANCER – ADAPTING YOUR APPROACH TO PATIENTS' NEEDS (page 26)

- 8** During an oral cancer screening test, the dentist must:
- a. Explain the procedure to the patient.
 - b. Identify cancer risk factors when completing the medical questionnaire.
 - c. Conduct diagnostic tests without the patient's consent.
 - d. **a** and **b** only.
- 9** Which of the following is not a symptom to watch for when conducting self-examinations of the mouth?
- a. Swelling of the jaw that causes dentures to fit poorly
 - b. A sore in the mouth that lasts longer than two weeks
 - c. Poor oral hygiene
 - d. A white or red patch on the gums, tongue or edge of the lip

DENTISTS' ROLE IN HELPING PATIENTS QUIT SMOKING (page 28)

- 10** What percentage of periodontitis is attributable to smoking?
- a. 30%
 - b. 40%
 - c. 50%
 - d. 60%
- 11** During a minimal intervention with a smoking patient, the dentist should:
- a. Evaluate the patient's smoking status.
 - b. **a** and advise the patient to quit smoking.
 - c. **a** and **b** and determine the patient's stage of change in behaviour.
 - d. **a**, **b** and **c** and refer the patient to the appropriate services.
- 12** Dentists should counsel patients on smoking, depending on the patient's stage of change in behaviour. They should offer counselling only if the patient is:
- a. At the precontemplation or contemplation stage
 - b. At the preparation stage
 - c. At the action or maintenance stage
 - d. At any of these stages

THERAPEUTIC MODALITIES FOR ORAL CANCER, PREPARING PATIENTS AND MANAGING SIDE EFFECTS (page 32)

- 13** What information does the dentist require in order to give a patient with oral cancer the proper oral and dental preparatory treatment before radiotherapy begins?
- a. The number of weeks of treatment
 - b. The irradiated field and planned dose, as well as the patient's oral and dental health
 - c. The histopathological report
 - d. The patient's tobacco use
- 14** Which of the following is not a side effect of xerostomia in irradiated patients?
- a. Hypersensitivity of the mucosa
 - b. Improper fit of a full upper denture
 - c. Osteoradionecrosis of the jaws
 - d. Rampant caries of the lower incisors
- 15** Which part of the jaws is much more susceptible to osteoradionecrosis following radiotherapy for oral cancer?
- a. The anterior maxillary area
 - b. The posterior maxillary area
 - c. The anterior mandibular area
 - d. The posterior mandibular area

CONTINUING EDUCATION PROGRAM

Answer Sheet

Journal dentaire du Québec

*Early Detection of Oral Cancer – Dentists Can Make
a Difference* Supplement

February 2004

Enter your name and address

Name _____

Permit No. _____

Address _____

Town/City _____

Province _____ Postal code _____

Telephone () _____

Fax () _____

E-mail _____

Circle only one answer for each question

- | | | | | |
|-----|---|---|---|---|
| 1. | a | b | c | d |
| 2. | a | b | c | d |
| 3. | a | b | c | d |
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| 5. | a | b | c | d |
| 6. | a | b | c | d |
| 7. | a | b | c | d |
| 8. | a | b | c | d |
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| 12. | a | b | c | d |
| 13. | a | b | c | d |
| 14. | a | b | c | d |
| 15. | a | b | c | d |

Return the completed answer sheet to:

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