The keys to early cancer diagnosis

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USA

The young man was just 19 when he came in to see his dentist after Halloween because of a sore on the side of his tongue. A non-smoker and non-drinker, he did not seem to be at risk for cancer, so his dentist decided to re-check the lesion before Christmas. By then the lesion was bigger. When he finally had a biopsy in January, the lesion proved to be an inva-
sive squamous cell carcinoma. Oropharyngeal cancer contin-
ues to claim the life of about one American every hour, account-
ning for 7,590 deaths in 2008, according to the American Cancer Society. Oral cancer presents a momentary op-
portunity to glimpse the orophar-
ynx and soft palate.

There has been a recent in-
crease in Human Papillomavirus (HPV)-associated squamous cell carcinoma of the base of the tongue and tonsils in young pa-
tients, a change that is attributed to a rise in high-risk HPV infec-
tion in the oral cavities of sexu-
ally active young adults. Never-
theless, the most common risk factors for oral cancer remain tobacco and alcohol use.

About 90 per cent of o-
oropharyngeal malignancies are squamous cell carcinoma of the surface mucosa. Precancerous muco
sal lesions are often white and may appear slightly rough; unexplained white lesions are of-
ten termed Leukoplakia. Lesions such as shown in Figure 1 look rough because the proliferating epithelium piles up on the sur-
face and the thickened epithelium hides the red colour of the underly-
ing blood vessels.

Malignancies of surface tis-
sues, as seen in Figure 2, are often red and enlarged; unexplained red lesions are termed erythroplakia. Unexplained red lesions are more likely to be diagnosed as malignancies than white lesions when they are biop-
sied because the expanding ma-
lignancy causes inflammation and secretes molecules that stim-
ulate the formation of new blood vessels. However, both red and white lesions are capable of rep-
senting malignancy. Malignan-
cies may cause spontaneous pain or paraesthesia. The general rule 
of thumb is that unexplained red, white and/or ulcerated lesions

...clinical appearance of lacy white lines on a red background and also the microscopic feature of a dense T-lymphocyte infiltrate along the basement membrane. Lichenoid conditions are proba-
bly not all equally likely to gener-
ate squamous cell carcinoma.

A lichenoid drug reaction, for example, is a reaction to a sys-

topic medication that dis-

appears when the medication is withdrawn. Lichenoid reactions 
can also result from contact with an allergenic material, such as a

or even microscopic diagnosis of lichen planus was incorrect. Apparent malignant transforma-
tion of oral lichen planus (OLP) may represent “red and white lesions that were dysplastic from their inception but that mimic OLP both clinically and histologi-

...ably not all equally likely to gener-

te squamous cell carcinoma.

Warty-looking verrucous con-
ditions also may confuse den-

...tists. Many diseases in this group
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are caused by HPV. Benign members of this group include verruca vulgaris, the common wart (Fig. 6), which is self-limiting in most patients, and condylomata, genital warts (Fig. 7), which can be widespread in the immunosuppressed patient.

There are also pre-malignancies and malignancies in this group. Proliferative verrucous leukoplakia (PVL) is a multifocal verrucous disease that eventually turns into carcinoma in a substantial proportion of cases. Figure 1 may represent a case of PVL. Verrucous carcinoma is a large warty malignancy that is slow to invade but can degenerate into squamous cell carcinoma.

Several commercial chairside applications, such as toluidine blue staining, tissue reflectance, fluorescence imaging and brush tests, have appeared on the market in the past decade, which are intended to help the dentist with early cancer detection. Despite their attractive marketing and convenience, they have not been proven by rigorous Cochrane analysis to either help or hinder early cancer detection in the general population. Even visual screening programmes have not been proven to help reduce oral cancer deaths, and more study is needed in this field. Table 1 summarises the currently available adjunctive technologies.

This leaves the dentist with a very powerful tool: the biopsy, which is still the only technique that definitively diagnoses oral cancer. When combined with a detailed patient history, as well as thorough head and neck examination, it can allow the dentist to diagnose oral lesions with much more confidence as possible.

A biopsy is simply the removal of tissue from a living patient for the purposes of diagnosis. Whether the dentist uses a scalpel, surgical scissors or a surgical punch, the aim is to retrieve a piece of tissue that is representative of the entire lesion and preserve it en route to the oral pathology laboratory (Fig. 8). At the laboratory, the specimen is processed on a glass slide and diagnosed microscopically. Usually it takes a week or less for the oral pathologist to finalise the biopsy report.

The American Academy of Oral and Maxillofacial Pathology recommends that for aesthetic and functional reasons all tissue removed from the oral cavity be sent to an oral pathologist as a biopsy, unless it results from a routine procedure, such as a gingivectomy. Most oral pathologists’ services are covered by the patient’s medical insurance. General pathologists will also accept biopsies from dentists; however, it should be considered that oral pathologists receive at least three years of specialty training after dental school and are truly specialists in oral disease.

By routinely examining every patient thoroughly for signs of head and neck cancer, and ensuring that any potentially suspicious lesion persists for more than ten days is appropriate, biopsied and sent to an oral pathologist for diagnosis, dentists may indeed save lives.

Table 1: Commercial techniques intended to aid oral cancer detection.

<table>
<thead>
<tr>
<th>Technique</th>
<th>Example of common brand name</th>
<th>How it works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tissue reflectance</td>
<td>VisiWhite</td>
<td>Enhances the appearance of white areas</td>
</tr>
<tr>
<td>Tissue autofluorescence</td>
<td>Velsec</td>
<td>Abnormal tissue loses a normal green autofluorescence, appears black</td>
</tr>
<tr>
<td>Brush test</td>
<td>Oral CDx</td>
<td>Superficial epithelial sample is classified as positive, negative or atypical</td>
</tr>
</tbody>
</table>

Table 2: Commercial techniques intended to aid oral cancer detection.

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