Early Detection of Oral Cancer

Daniel Petrisor, DMD, MD

OREGON HEALTH & SCIENCE UNIVERSITY
OHSU

Sunset Oral & Maxillofacial Surgery

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Overview

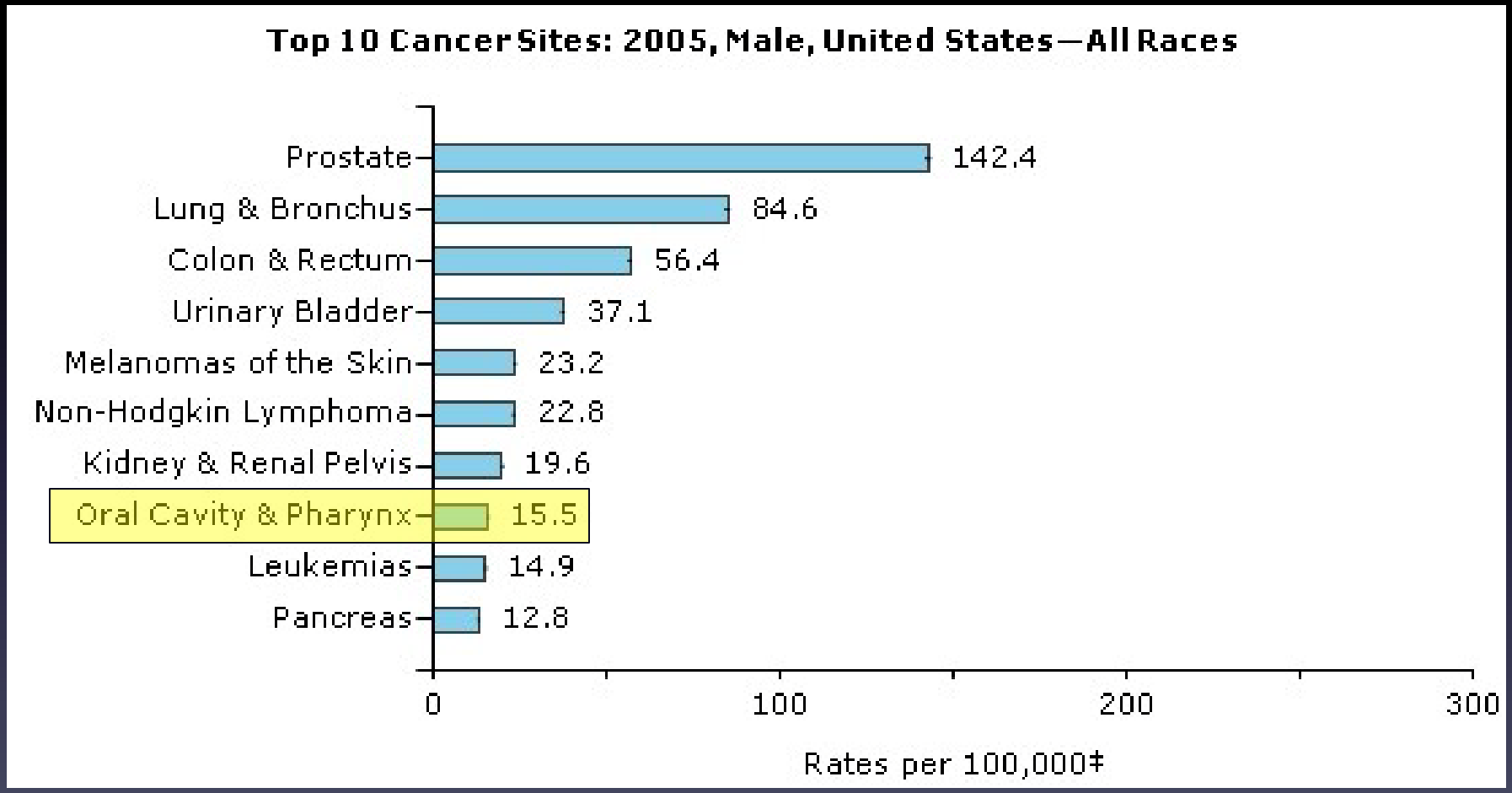
- Epidemiology
- Risk Factors
- Diagnosis
- Work-up
- Management of the Primary
- Management of the Neck
- PET
- Head & Neck Reconstruction

Epidemiology

- Head & Neck Cancer
  - 3-5% of all new cancer diagnoses in USA
  - 40,000 new cases diagnosed each year
- Oral cavity
  - #1 location for head & neck cancer
  - 23,110 new cases & 5370 deaths in 2009
  - Compared to cervical cancer?

Horner MJ, Ries LAG, Krapcho M, Neyman N, Aminou R, Howlader N, Altekruse SF, Feuer EJ, Huang L, Mariotto A, Miller BA, Lewis DR, Eisner MP, Stinchcomb DG, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2006, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2006/, based on November 2008 SEER data submission, posted to the SEER web site, 2009

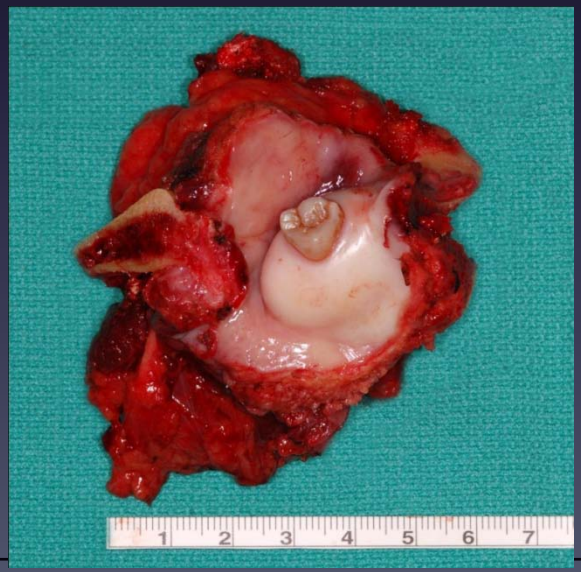
Epidemiology



U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2005 Incidence and Mortality Web-based Report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2009. Available at: www.cdc.gov/uscs

Epidemiology

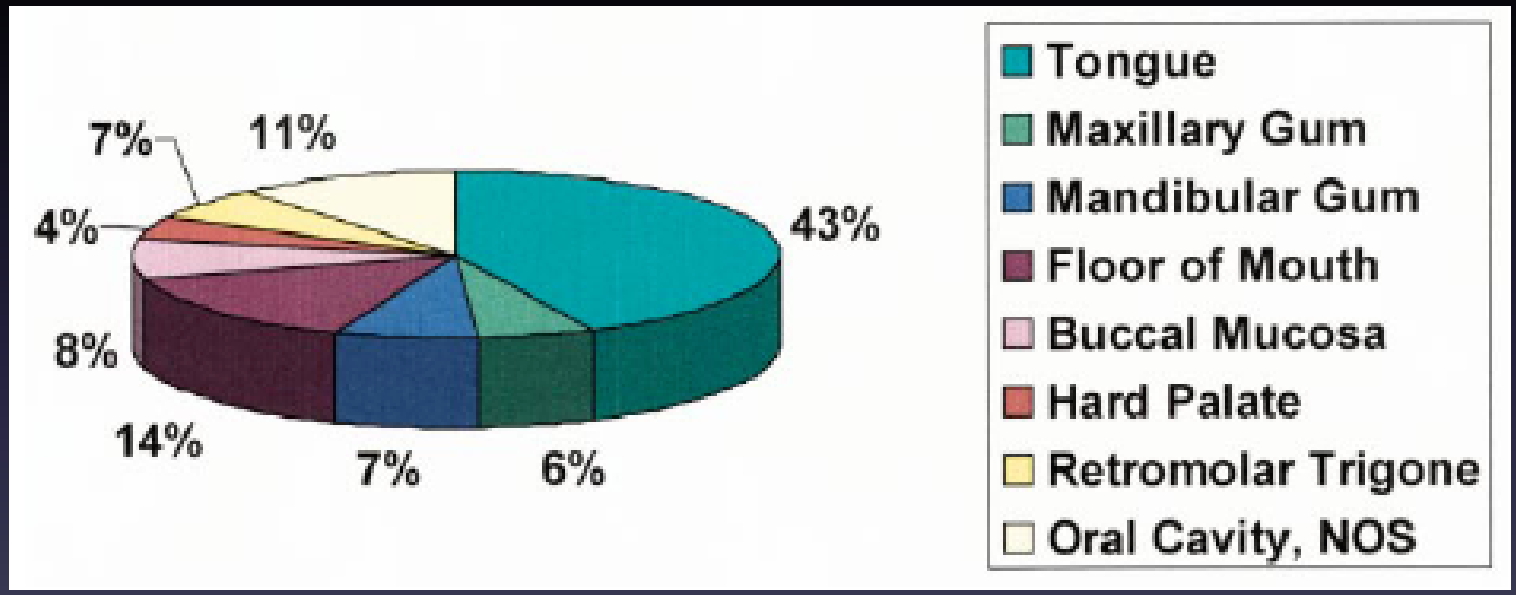
- 5-year Survival
  - 59% overall
  - Early lesions >85% survival
  - Late stage <25% survival
  - 66% of oral cancer patients present with advanced disease



AMERICAN CANCER SOCIETY®

SOMS

Epidemiology



Age

- 92% oral cancer patients are over 40 (avg 63)[1]
- Incidence increases until 70-74 then declines[2]
- Increasing in younger patients

[1]Horner MJ, R.L., Krapcho M, Neyman N, Aminou R, Howlader N, Altekruse SF, Feuer EJ, Huang L, Mariotto A, Miller BA, Lewis DR, Eisner MP, Stinchcomb DG, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2006, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2006/, based on November 2008 SEER data submission, posted to the SEER web site, 2009.

[2]Swango, P.A., Cancers of the oral cavity and pharynx in the United States: an epidemiologic overview. Journal of public health dentistry, 1996. 56(6): p. 309-318.

Age Distribution In Oral Cancer

Age (yr)	N	%	M:F
<20	130	<1	1:0
20-39	1,604	7	2:0
40-49	2,432	11	2:5
50-64	7,163	32	2:4
65+	11,170	50	1:6

NCI's SEER data 1985 to 1996

Risk Factors

- Smoking
  - Single most important risk factor
  - Cessation for 10 years reduces risk 50%
- Alcohol
  - Synergistic with tobacco

Macfarlane, G.J., et al., Alcohol, tobacco, diet and the risk of oral cancer: a pooled analysis of three case-control studies. European journal of cancer. Part B, Oral oncology, 1995. 31B(3): p. 181-187.

Tobacco and oral diseases--report of EU Working Group, 1999. The Journal of the Irish Dental Association, 2000. 46(1): p. 12-9, 22.

Moreno-Lopez, L.A., et al., Risk of oral cancer associated with tobacco smoking, alcohol consumption and oral hygiene: a case-control study in Madrid, Spain. Oral oncology, 2000. 36(2): p. 170-174

Smoking Tobacco, Oral Snuff, and Alcohol in the Etiology of Squamous Cell Carcinoma of the Head and Neck

A Population-Based Case–Referent Study in Sweden

CANCER April 1, 1998 / Volume 82 / Number 7

- Alcohol
  - Moderate intake (10-19 g/day) not a risk factor
  - High intake (>50g/day) is independent risk factor
  - Synergistic effect with tobacco (RR 22 vs 6 of tobacco alone)
  - Dries mucosa, increased retention of carcinogens

Cancer incidence among a cohort of smokeless tobacco users (United States)

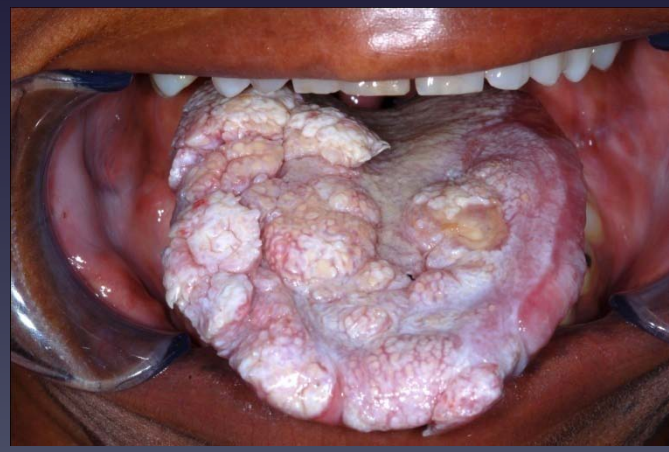
Neil A. Accortt[1,*], John W. Waterbor[2], Colleen Beall[2] & George Howard[3]
[1]*Medical Statistics Section, Department of Medicine, University of Alabama at Birmingham, Birmingham, AL, USA;* [2]*Department of Epidemiology, School of Public Health, University of Alabama at Birmingham, Birmingham, AL, USA;* [3]*Department of Biostatistics, School of Public Health, University of Alabama at Birmingham, Birmingham, AL, USA*

Cancer Causes and Control (2005) 16:1107–1115

- Smokeless tobacco
  - 6779 subjects (age 45-75)
  - No significant increase in risk of any cancer (RR 0.8 for males, 1.2 for females)
  - No synergistic effect with smoking tobacco

Etiology

- Smokeless tobacco
  - Minimal increased risk for oral SCC
  - Possibly well-differentiated SCC at site of tobacco
  - Typically 40+ years of chronic use
- HPV
  - Oropharynx > oral cavity
  - Gardasil?



Mechanism of carcinogenesis

Carcinogens + DNA

↘

DNA adducts (*O*-6-methylguanine)

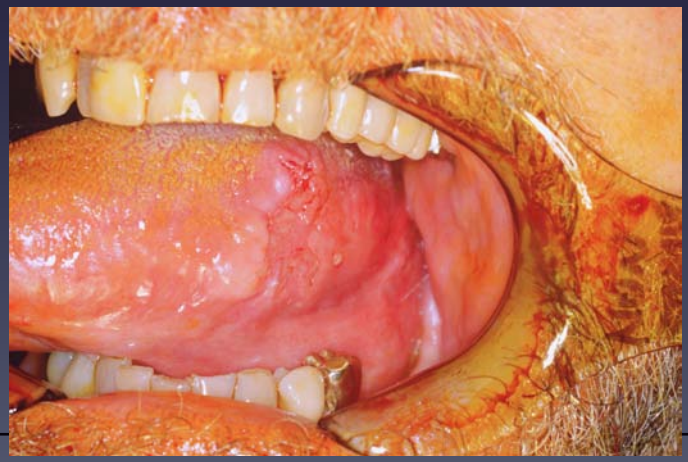
↘

DNA replication (errors & inhibition)

↘

Mutations & Instability

↘



Early Lesions - Leukoplakia

- ‘A white patch that cannot be rubbed off and cannot be characterized clinically or histologically as any other lesion.’

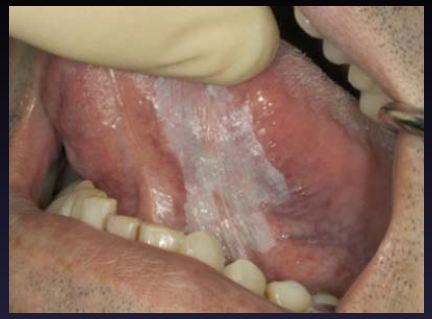
A clinical descriptive term. Is not a diagnosis. Use histology to define the lesion.

Possible Diagnosis

- Hyperkeratosis without dyplasia
- Hyperkeratosis with mild/moderate/severe dysplasia
- CIS
- Carcinoma
- Others
  - Lichen Planus, white sponge nevus, candida…

Early Lesions

- Leukoplakia:[1]
  - 62% No dysplasia
  - 26% Mild dysplasia
  - 6% Moderate dysplaisa
  - 6% Carcinoma-in-situ

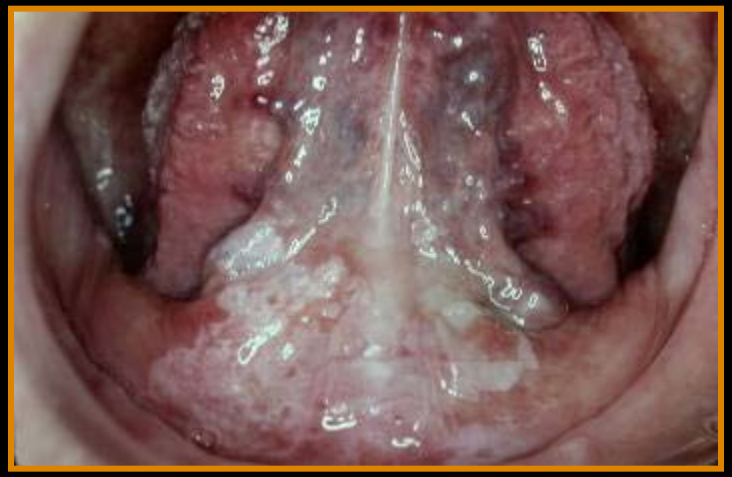


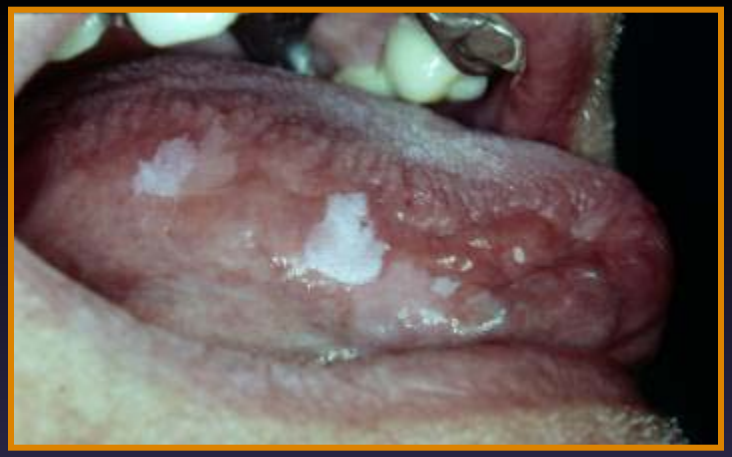
[1]Bornstein MM, Benguerel MC, Magnin P, Meier E, Buser D. Oral leukoplakia. A retrospective study of clinical and histological data. Schweiz Monatsschr Zahnmed. 2004;114(7):680-6.

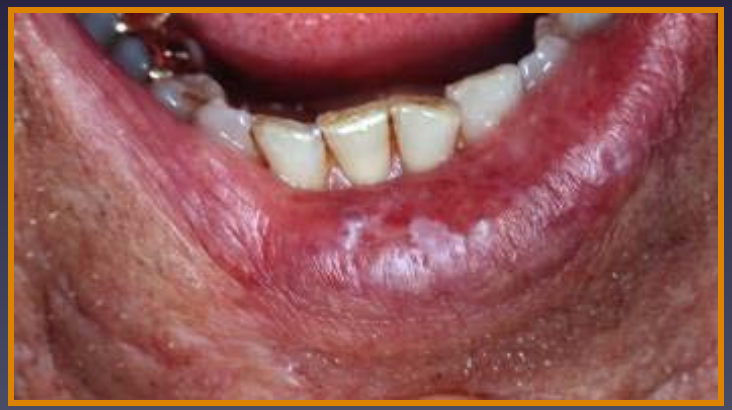
[2]Shafer WG, Waldron CA. Erythroplakia of the oral cavity. Cancer. 1975 Sep;36(3):1021-8.

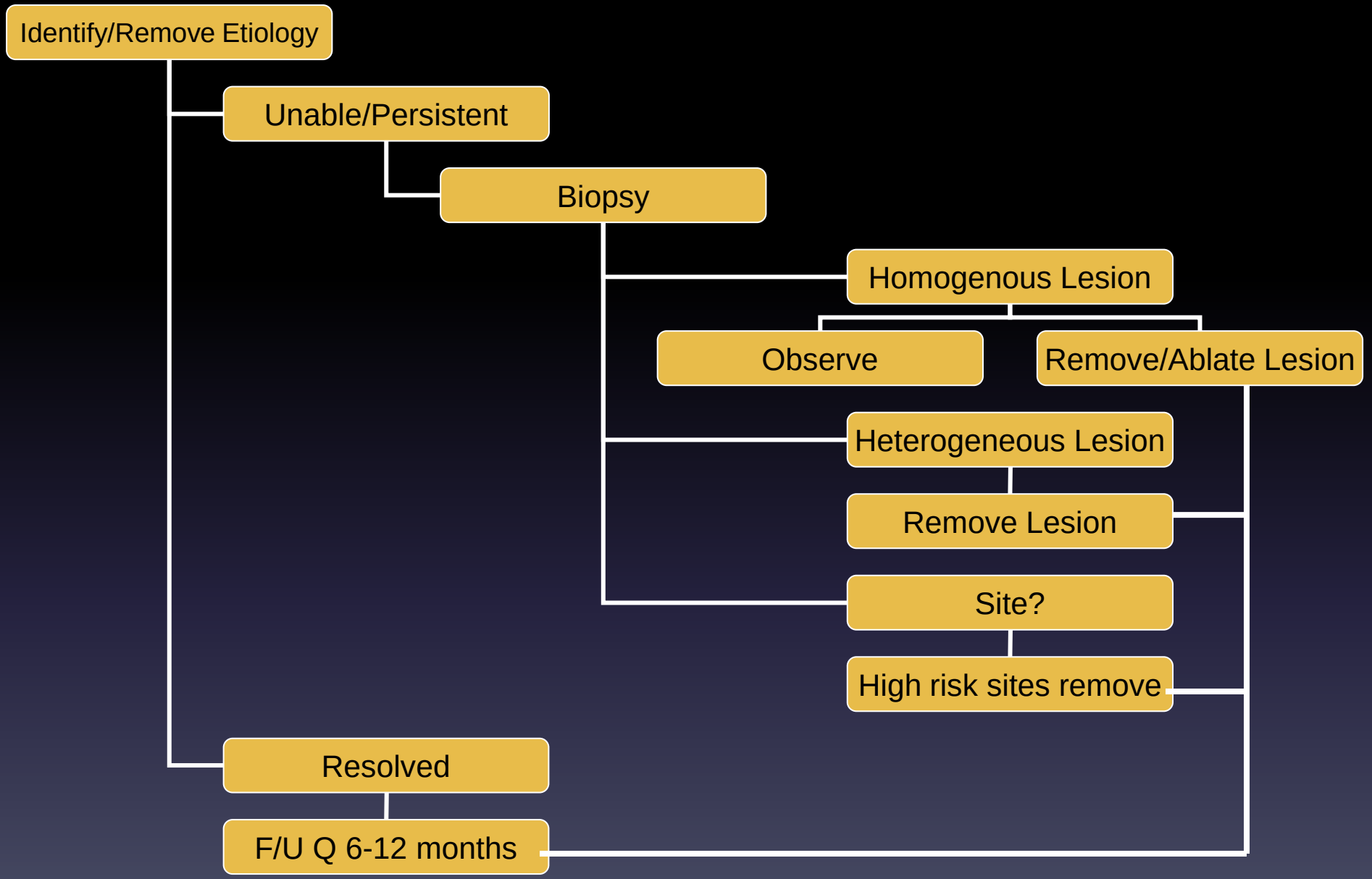
Site Dysplasia/Carcinoma

Floor of mouth	43%
Lateral Tongue	24%
Lower Lip	24%



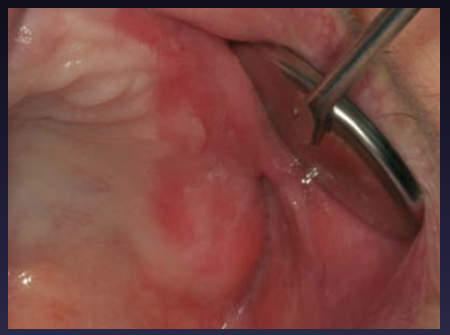





Identify/Remove Etiology
Unable/Persistent
Biopsy
Homogenous Lesion
Observe
Remove/Ablate Lesion
Heterogeneous Lesion
Remove Lesion
Site?
High risk sites remove
Resolved
F/U Q 6-12 months

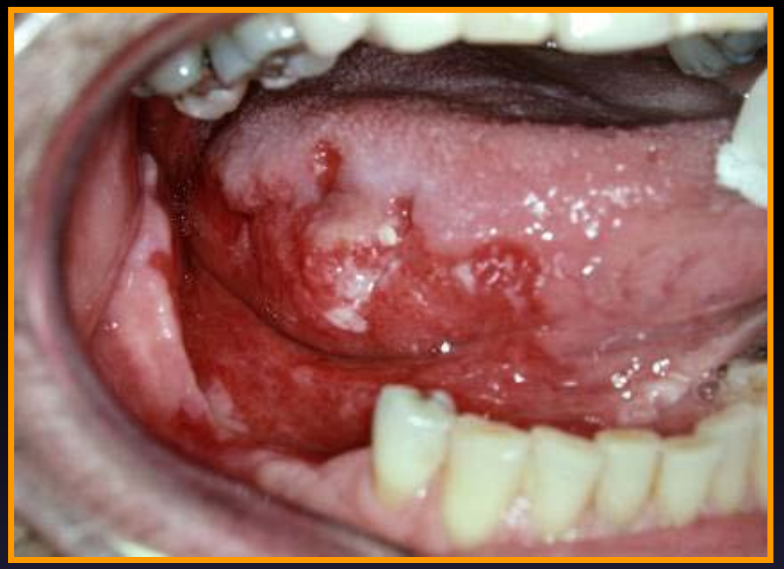
Erythroplakia

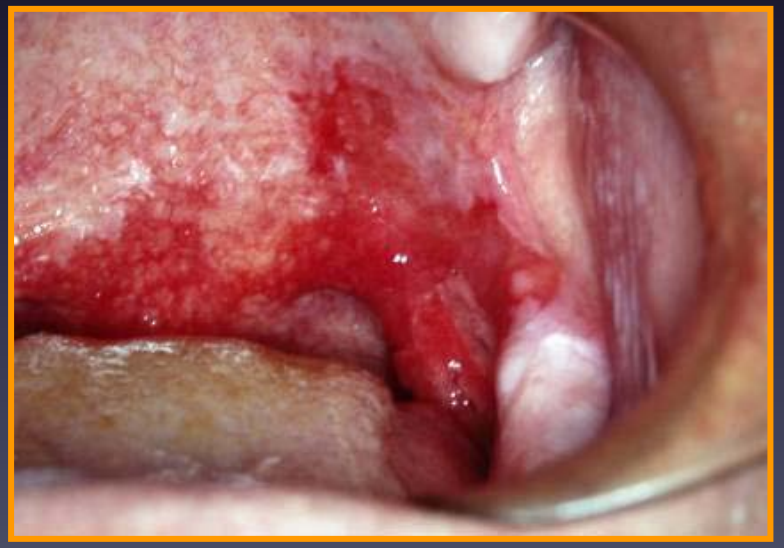
- Erythroplakia:[2]
  - 9% mild/mod dysplasia
  - 40% carcinoma-in-situ
  - 51% invasive carcinoma



Erythroplakia

- Floor of mouth 49%
- Soft palate / Ant-Pillar / RMT 31%
- Lateral tongue 17%





Erythroplakia

- 91% show Severe Dysplasia, CIS or Invasive Carcinoma

Who Screens for Oral Cancer?

- Dentist
- Hygienist
- Physician
- Patient
- Specialists
- Other health care providers

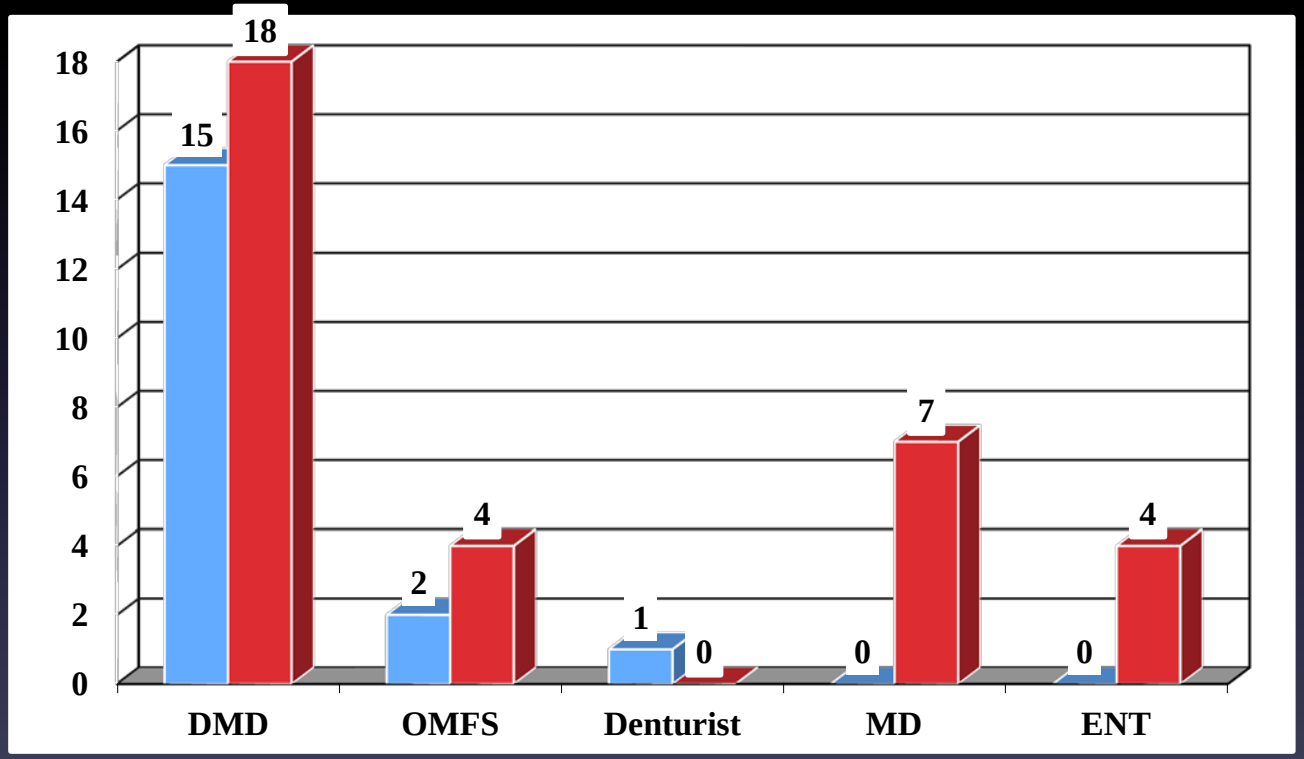
Dentistry to take the Lead

- Detection
  - Best familiarity with the oral mucosa
  - Best positioned to find early lesions
- Diagnosis
  - Best trained in oral pathology
- Treatment
  - Best understanding of the ramifications of disease, treatment and reconstruction.
- PREVENTION

Hygienists and Dentists in the Lead

- Holmes J, et al. J Oral Maxillofacial Surg. March 2003. 61: 285-291.
  - Retrospective review of 51 patients with oral/oropharyngeal SCCA
  - Analysis of symptom v non-symptom diagnosis and clinical/pathological stage at time of diagnosis
  - Comparative statistics of provider setting and initial management at time of diagnosis

Symptoms v. No Symptoms



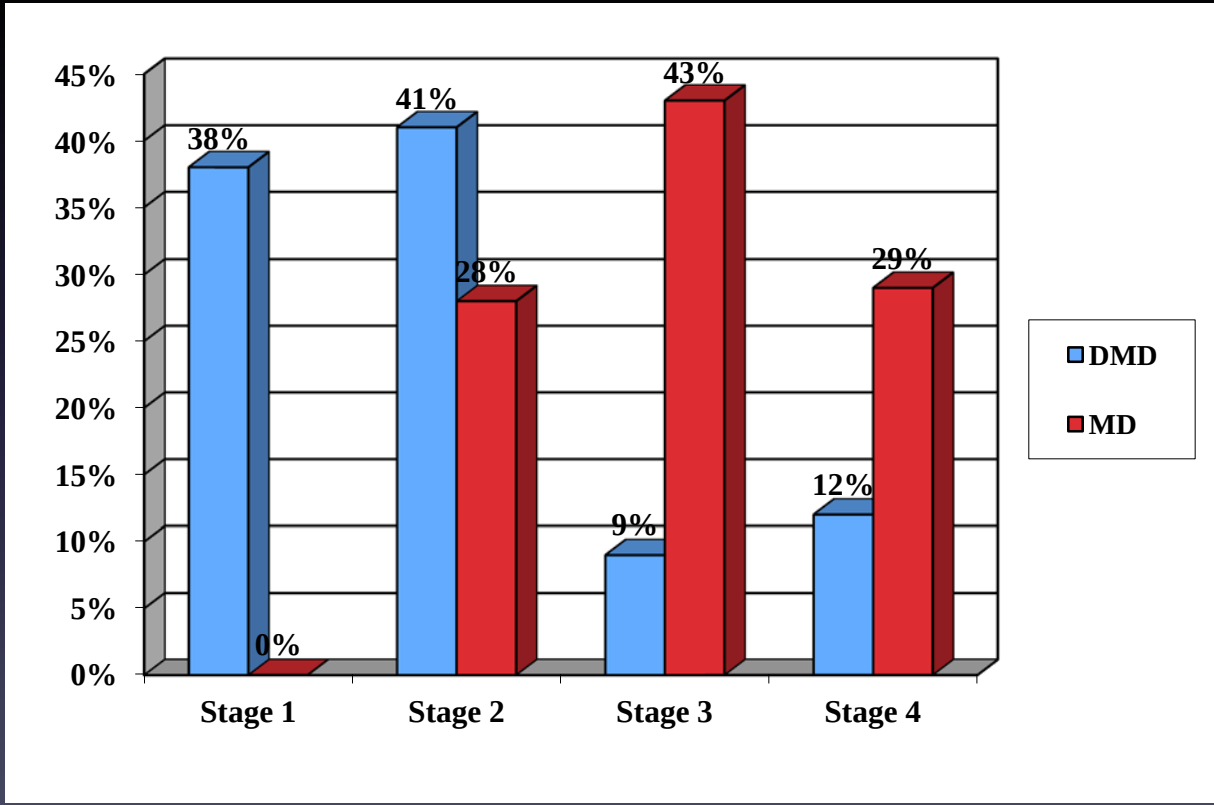
51 Cancers

17% - Hygienists

Holmes. JOMS. 2003

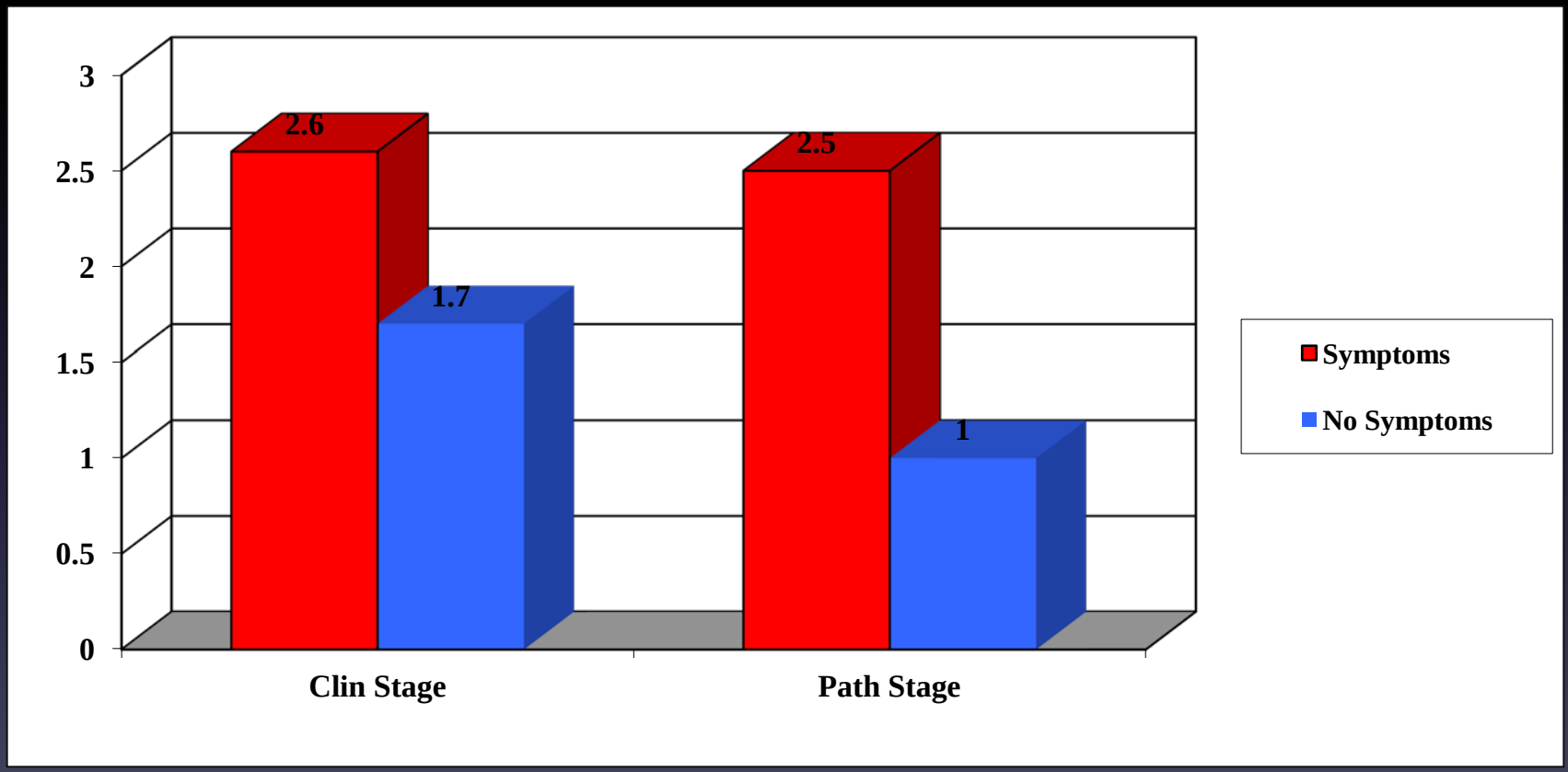
Clinical Stage at Diagnosis

- Office setting: General DMD v MD



Holmes. JOMS. 2003

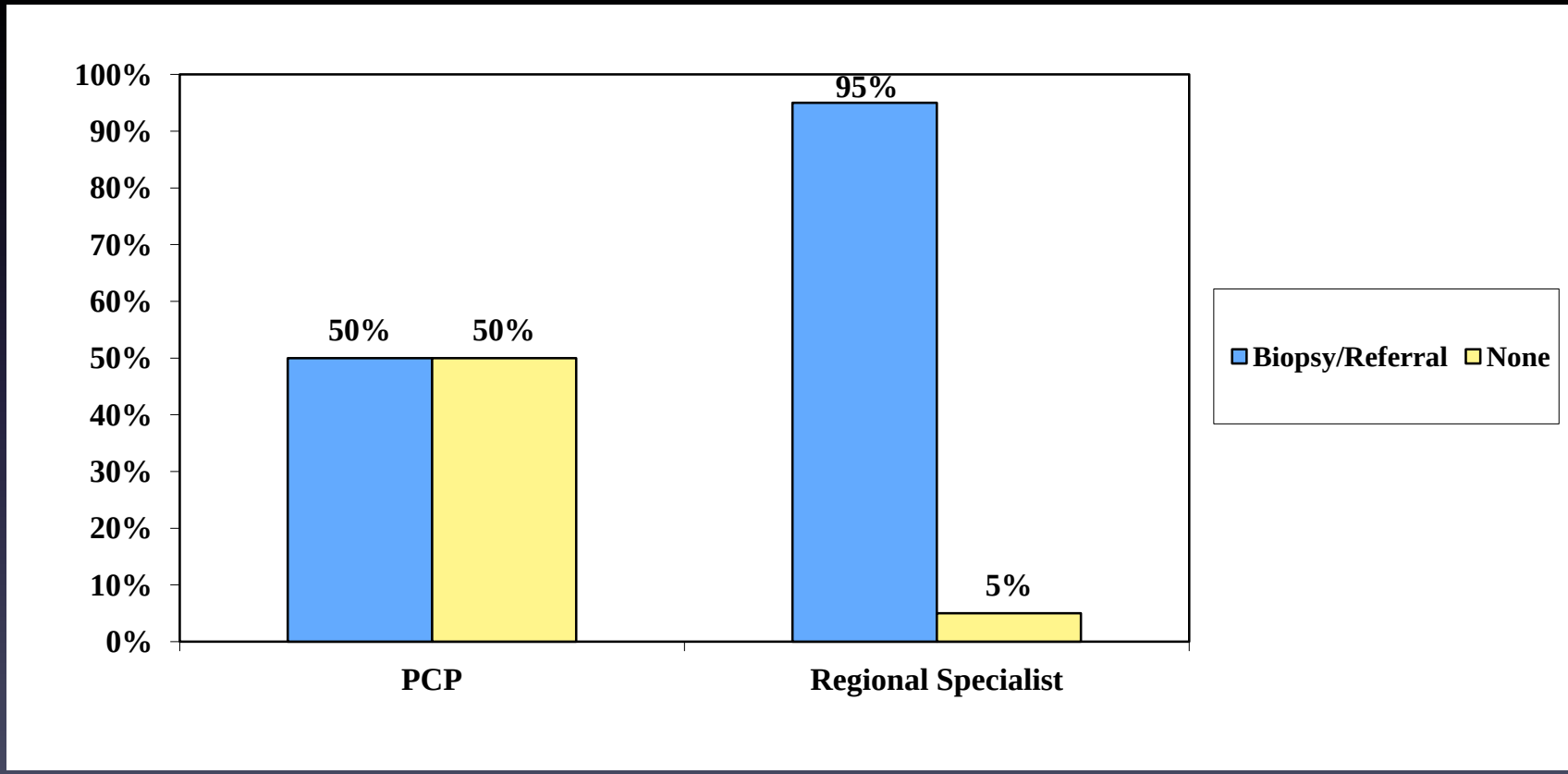
Non-symptom Diagnosis = ↓Stage



Holmes. JOMS. 2003

Office setting = Proper Pt Management

Management of Patients ***with Symptoms***



Holmes. JOMS. 2003

Conclusions

- Dental Health care providers are in a unique position to effectively screen for asymptomatic cancer
- Patients with asymptomatic cancers have smaller lesions, fewer metastases, and lower stage disease.

Lower Stage = Better Survival

Holmes. JOMS. 2003

SOMS

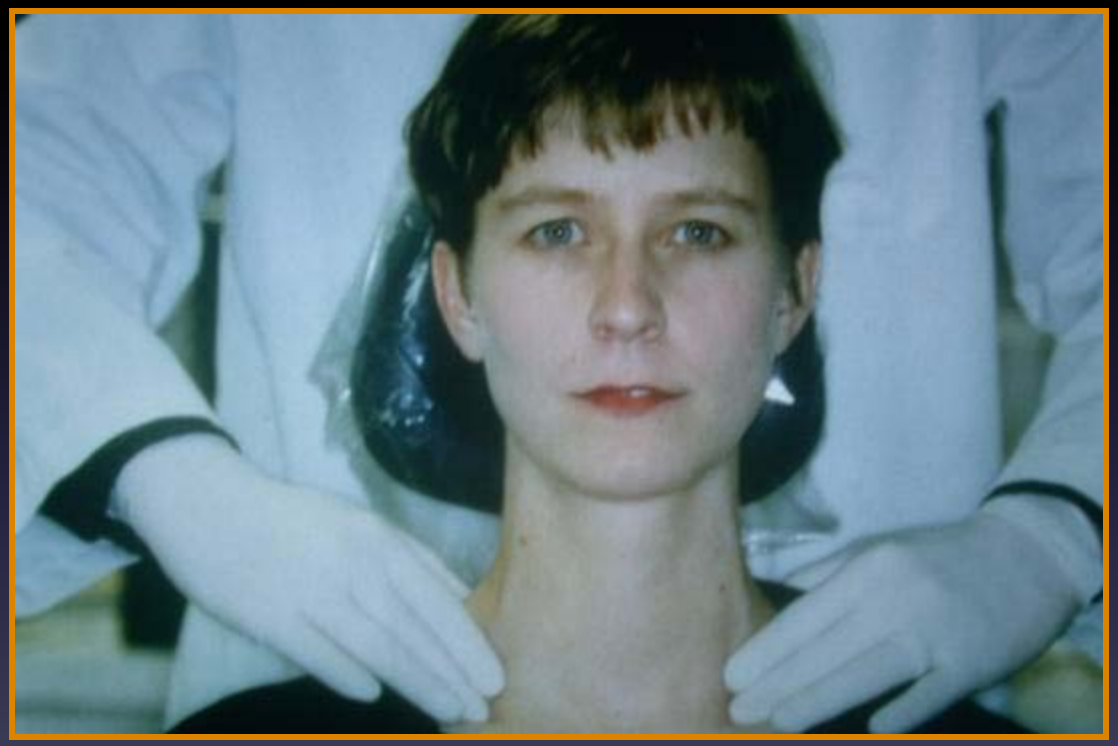
Head & Neck Exam

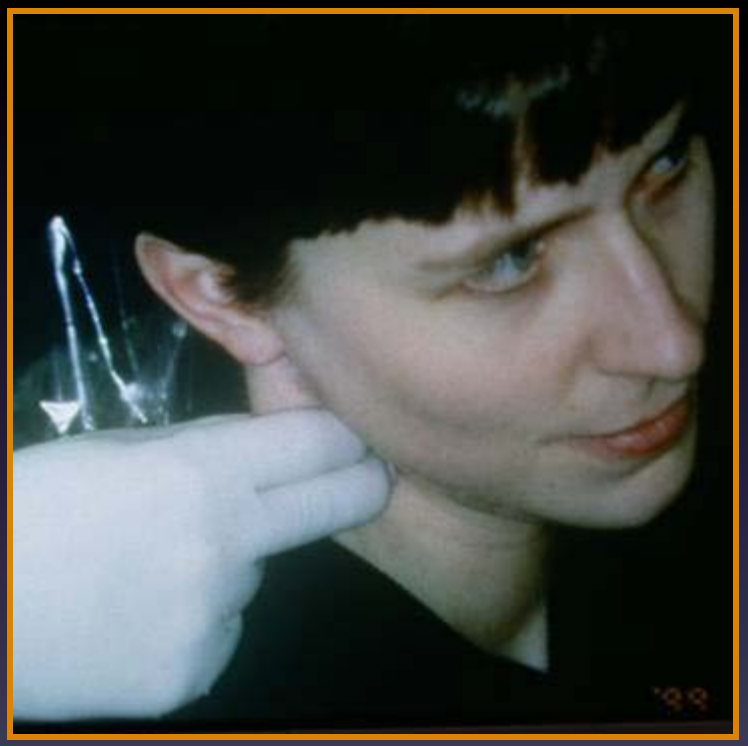
SOMS

How reliable is clinical exam?

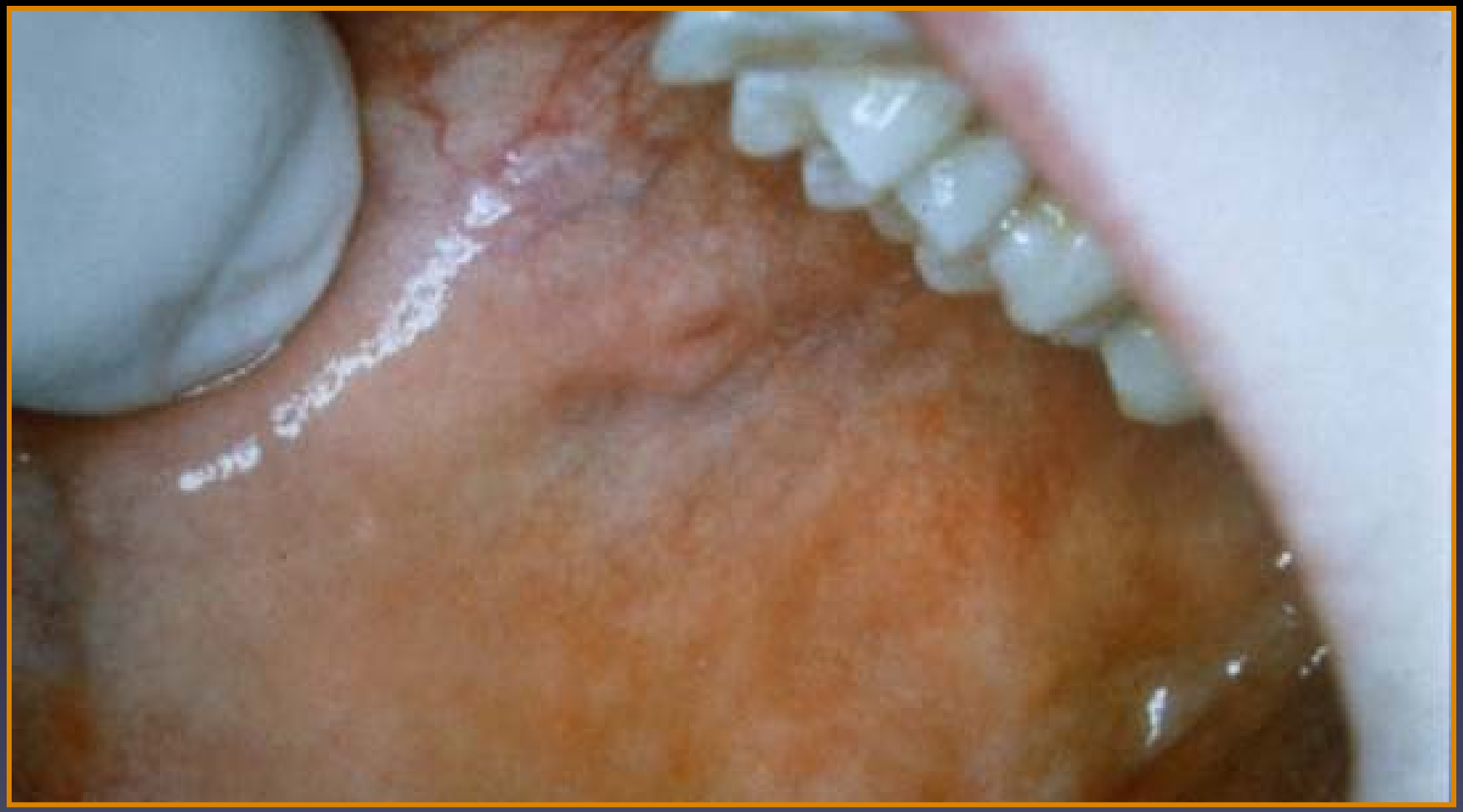
- Sensitivity 57-61%
- Specificity 98%

Head & Neck Exam





Head & Neck Exam



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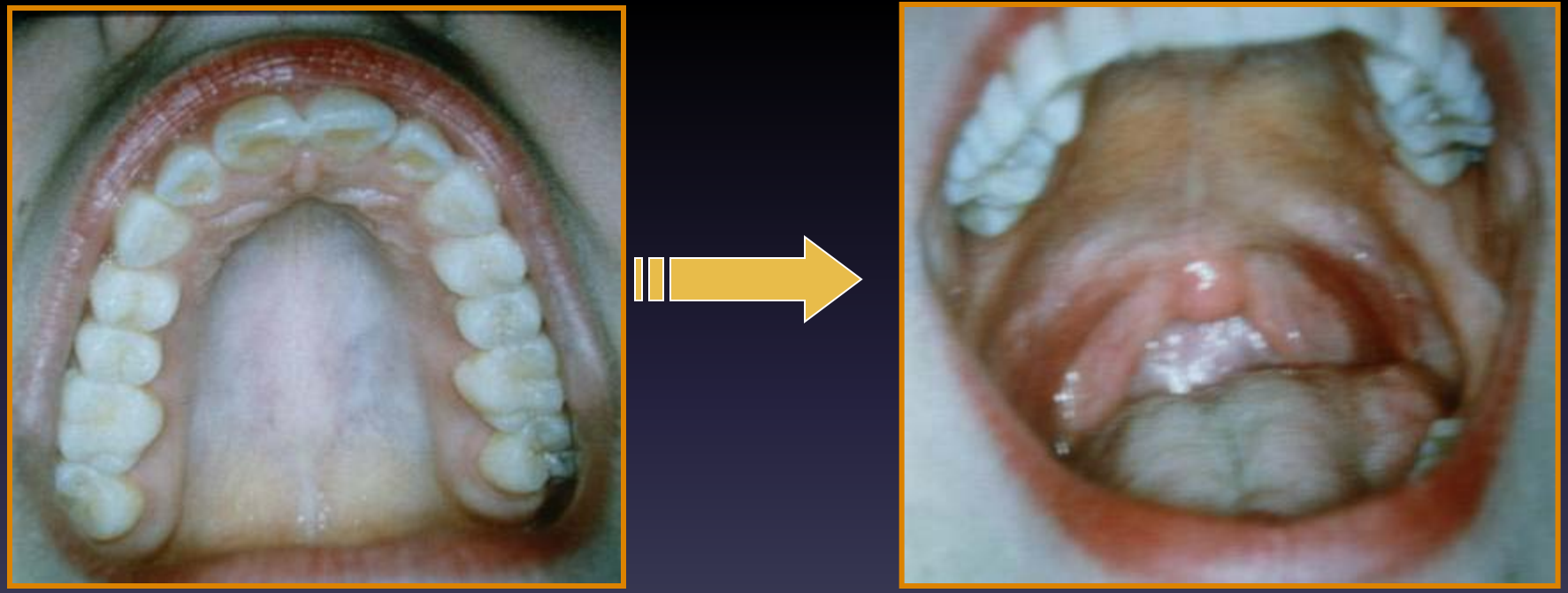

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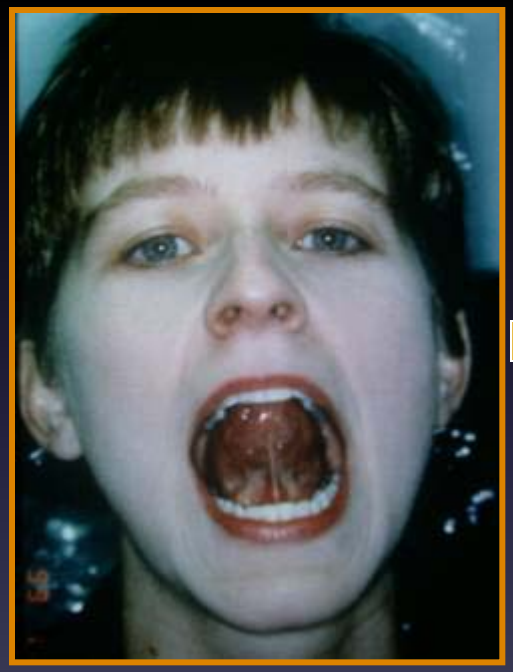
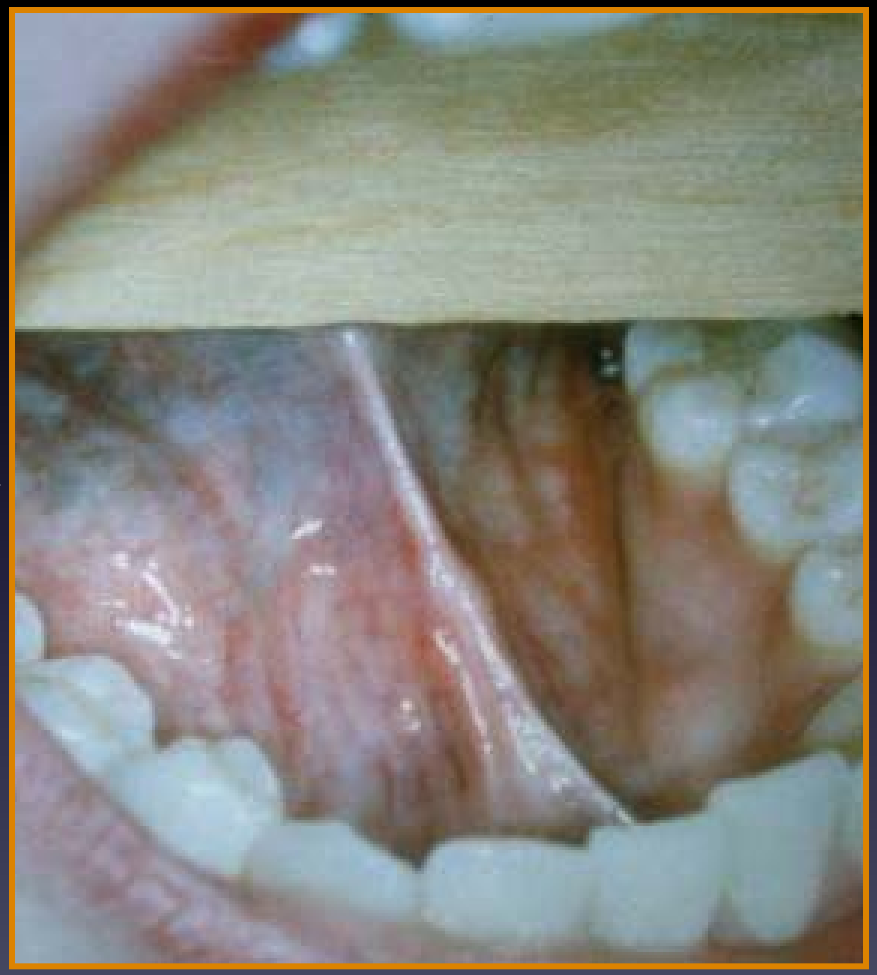
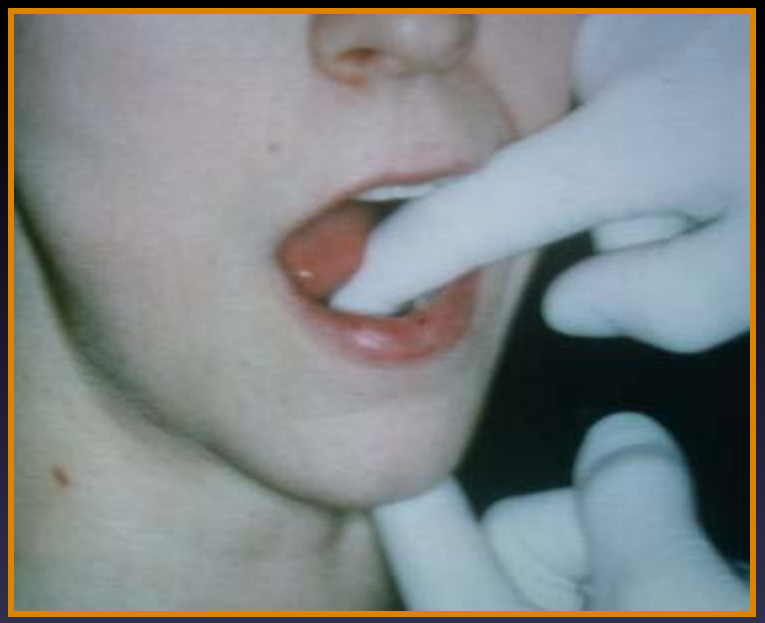
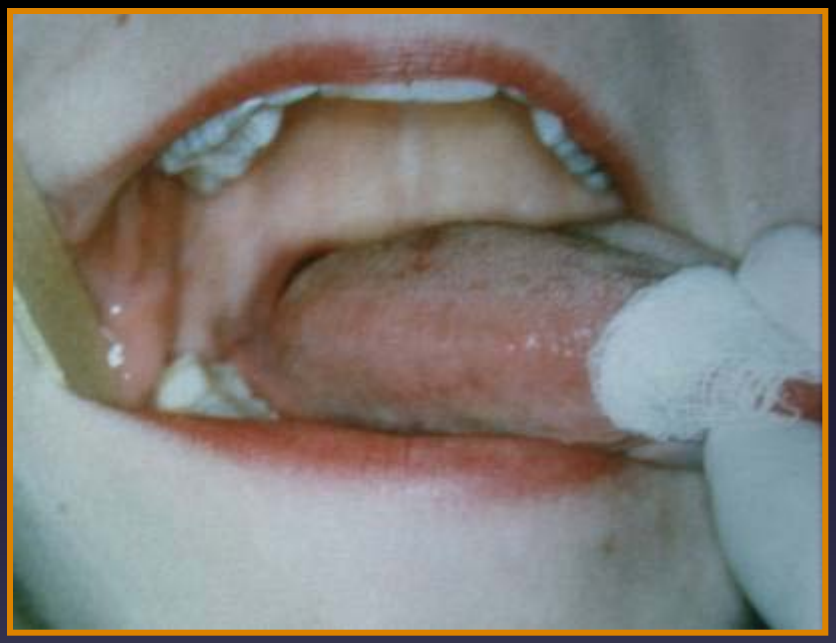




Head & Neck Exam





Ideal Screening Tool

- Noninvasive
- Inexpensive
- Rapid results
- Decrease disease morbidity & mortality
- Reliable
  - PPV & NPV

Goal: detection of disease early enough for treatment to be successful.

Toluidine Blue Staining

Toluidine Blue

Topical Application

False positive	5.7%
False negative	2.5%

Mashberg A.

JADA 1983

Toluidine Blue

- Rinse Mouth — 20 seconds
- Rinse Mouth — 20 seconds
  (1% acetic acid)
- Dry w/ gauze gently
- Swab area with Toluidene Blue — 2 minutes
- Rinse Mouth — 1 minute
  (1% acetic acid)

Adjuncts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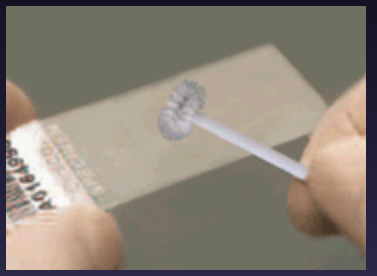

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The BrushTest®

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Sunday, July 18

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A Doctor's Guide to OralCDx
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Buses begin rolling again as part of the continued collaboration between **The American Dental Association** and OralCDx Laboratories. The ads spotlight how a quick brush test of common oral spots can detect pre-cancerous cells - years before oral cancer can even start.

$10 each

Clin Oral Invest
DOI 10.1007/s00784-010-0434-6

ORIGINAL ARTICLE

Diagnostic efficiency of differentiating small cancerous and precancerous lesions using mucosal brush smears of the oral cavity—a prospective and blinded study

Felix Peter Koch · Martin Kunkel · Stefan Biesterfeld · Wilfried Wagner

Received: 30 July 2009 /Accepted: 7 June 2010

Abstract The aim of this study was to evaluate the diagnostic accuracy of oral brush biopsy to identify early malignancy. One hundred and eighty-six brush biopsies of suspicious mucosal lesions were obtained, haematoxilin and eosin (H&E)-stained and compared with the histology of conventional excision biopsies of the same site performed concomitantly. The sensitivity for identifying squamous cell carcinoma (SCC) was 88.5%. High-risk lesions including squamous intraepithelial neoplasia (SIN II, SIN III) and SCC were identified with a sensitivity of 86.4%, using a pap-analogous classification, which is considered to be carcinomatous, as well as moderate and severe dysplastic cells positive. Depending on the cytopathologic definition for malignancy and the tumour size, the test accuracy varied: Extending the cytopathologic criteria for malignancy by defining all dysplastic or malignant cytopathologic findings as positive, the sensitivity was increased to 95.2% at the expense of the specificity, which was reduced from 94.9% to 82.3%. Separately analysing SCCs of less than 20 mm, the sensitivity was reduced by 9.5% to 78%. Although small malignant lesions seem to be less reliable by the conventional oral brush biopsy, it is a useful screening instrument for early diagnosis of suspicious, epithelial lesions and could therefore contribute to improved cancer prognosis.

Keywords Brush biopsy · Prevention · Minimally invasive · Oral cancer · Diagnostic · Clinical study

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Published online: 01 July 2010

Introduction

Three percent of all cancer diseases in the EU are located in the oral cavity and the oropharynx, and 74,440 patients contract oral cancer [1]. Worldwide, 300,000 patients suffer from oral or oropharynx cancer [2]. When the tumour disease is beyond an advanced stage (Union Internationale Contre le Cancer (UICC) stage III or IV), the prognosis of surviving the following 5 years falls to 30–50%; whereas for diseases discovered, early the survival rate is 80% [3–5]. In addition, the treatment of advanced diseases often results in social stigmatisation, speech disabilities, or nutrition problems [6–9]. As a result, early discovery of oral cancer is an important objective. The failure of early diagnosis could be due to hesitation in taking excision biopsies in the general practitioner's setting. The oral brush biopsy could lower the threshold of sampling and should therefore be considered, as long as its limitations are made clear.

The diagnostic cytology of epithelial lesions was first established as a screening method to diagnose carcinoma of the uterine cervix in the 1950s. Since then, mucosa from

- 186 lesions suspicious for SCC
- Brush Bx and Scalpel Bx
- Sensitivity 88%
- Specificity 95%
- SCC's <2cm sensitivity=78%

Our results suggest that there is limited accuracy of the conventional oral brush biopsy in finding a definitive diagnosis of precursor and related lesions, particularly early SCC less than 20 mm in diameter. Conventional brush

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Wednesday, October 29, 2008

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Case Study 1

Clinician:
Dr. Richard M. Nelson
Oral and Maxillofacial Surgeon
Denver, Colorado

Patient:
64 year-old male, 1 pack/day smoker for 20 years.

Situation:
During my oral cancer examination, I detected a small, painless, red, ulcerated lesion on the floor of the mouth overlying the salivary duct. In the past, I would have watched this lesion to see if it would resolve or change. However, with the availability of the brush biopsy to evaluate harmless looking lesions, I tested it to rule out oral cancer.

OralCDx Analysis:
The brush biopsy result was positive, which warranted additional evaluation with an incisional biopsy.

Diagnosis and Treatment:
An incisional biopsy of the lesion was performed and the final diagnosis proved to be a squamous cell carcinoma in situ. The lesion was identified at an early stage and removed before it became a problem.

OralCDx Indications and Benefits:
As an oral and maxillofacial surgeon, I recommend that general dentists employ the brush biopsy tool for benign looking lesions that do not appear suspicious enough to refer to me: specifically, small white and red lesions that they see almost daily in their patients but do not ordinarily refer for biopsy.

Case Study 2

Putting it all together...

Head & Neck Oncology

BioMed Central

Research

Open Access

Diagnostic aids in the screening of oral cancer

Stefano Fedele

Address: Oral Medicine Unit, Division of Maxillofacial, Diagnostic, Medical and Surgical Sciences, UCL Eastman Dental Institute, 256 Gray's Inn Road, London WC1X 8LD, UK

Email: Stefano Fedele - s.fedele@eastman.ucl.ac.uk

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This article is available from: http://www.headandneckoncology.org/content/1/1/5

Abstract

The World Health Organization has clearly indentified prevention and early detection as major objectives in the control of the oral cancer burden worldwide. At the present time, screening of oral cancer and its pre-invasive intra-epithelial stages, as well as its early detection, is still largely based on visual examination of the mouth. There is strong available evidence to suggest that visual inspection of the oral mucosa is effective in reducing mortality from oral cancer in individuals exposed to risk factors. Simple visual examination, however, is well known to be limited by subjective interpretation and by the potential, albeit rare, occurrence of dysplasia and early OSCC within areas of normal-looking oral mucosa. As a consequence, adjunctive techniques have been suggested to increase our ability to differentiate between benign abnormalities and dysplastic/malignant changes as well as to identify areas of dysplasia/early OSCC that are not visible to naked eye. These include the use of toluidine blue, brush biopsy, chemiluminescence and tissue autofluorescence. The present paper reviews the evidence supporting the efficacy of the aforementioned techniques in improving the identification of dysplastic/malignant changes of the oral mucosa. We conclude that available studies have shown promising results, but strong evidence to support the use of oral cancer diagnostic aids is still lacking. Further research with clear objectives, well-defined population cohorts, and sound methodology is strongly required.

Introduction

Cancer of the head and neck (H&N cancer), including all oral, laryngeal and pharyngeal sites, is the sixth most common cancer, accounting for about 643 000 new cases annually [1]. About 40% of head and neck malignancies are known to be squamous cell carcinomas arising in the oral cavity [2]. Oral cancer is largely related to lifestyle, with major risk factors being tobacco and alcohol misuse. In addition to smoking, the use of smokeless tobacco has been strongly linked to oral cancer [2].

Five-year survival of oral cancer varies from 81% for patients with localized disease to 42% for those with regional disease and to 17% if distant metastases are present [3]. Generally, according to late-stage diagnosis, fewer than 50% of patients with oral and pharyngeal cancers survive more than 5 years. This rate has remained disappointingly low and relatively constant during the last few decades [2-4].

Treatment of oral cancer often produces dysfunction and distortions in speech, mastication and swallowing, and dental health. It can also affect the patient's ability to interact socially, hence it must be considered among the most debilitating and disfiguring of all cancers [4-6].

It is well established that virtually all oral squamous cell carcinomas (OSCCs) are preceded by visible changes in

> Further research with clear objectives, well-defined population cohorts and sound methodology is required before supporting the extensive use of oral cancer diagnostic aids in both primary and specialty settings.

Putting it all together...

Journal section: Oral Medicine and Pathology
Publication Types: Review

Analysis of new diagnostic methods in suspicious lesions of the oral mucosa

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Trullenque-Eriksson A, Muñoz -Corcuera M, Campo-Trapero J, Cano-Sánchez J, Bascones-Martínez A. Analysis of new diagnostic methods in suspicious lesions of the oral mucosa. Med Oral Patol Oral Cir Bucal. 2009 May 1;14 (5):E210-6.

Conclusion: Clinical examination and histopathological confirmation with biopsy remain the gold standard for the detection of oral cancer. More randomised controlled studies are needed to confirm the positive cost-benefit relationship and the true usefulness of these "new diagnostic methods" in oral mucosal pathology.

Abstract

Objective: The objective of this study was to analyse publications related to examination techniques that might improve the visualisation of suspicious lesions of the oral mucosa (ViziLite® system and VELscope® system) or that might facilitate the cytological identification of suspicious lesions (OralCDx®).
Methods: A literature search was performed, using the PubMed database and the key words "brush biopsy", "OralCDx", "ViziLite" and "Velscope", limiting the search to papers in English or Spanish published from 2002 to 2008.
Results: According to the results of studies identified, the ViziLite® system has a sensitivity of 100% and specificity ranging from 0-14.2%, the VELscope® system has a sensitivity of 98-100% and specificity of 94-100% and the Oral CDx® system has a sensitivity of 71.4-100% and specificity of 32-100%.
Conclusion: Clinical examination and histopathological confirmation with biopsy remain the gold standard for the detection of oral cancer. More randomised controlled studies are needed to confirm the positive cost-benefit relationship and the true usefulness of these "new diagnostic methods" in oral mucosal pathology.

Key words: *ViziLite, VELscope, OralCDx, brush biopsy, oral cancer, precancer, diagnosis.*

Introduction

Oral cancer is the sixth most frequent malignant tumour (1), with around 500,000 cases worldwide (2). Although the morbidity and mortality of other types of cancer have decreased over the past few decades, the same is not true for oral cancer. Its treatment can be easy and unaggressive when the diagnosis is early, with a survival rate of around 80% (3). Nevertheless, around 50% of diagnosed patients die within five years (4).
One-third of patients diagnosed with a malignant oral neoplasm report that they were examined during the three years before the diagnosis (5). Consequently, oral health professionals play an important role in the early detection of malignant and premalignant conditions and could make a considerable contribution to a decrease in its incidence by identifying high risk patients and educating them in healthy habits (6,7).
At present, the main approach to detect epithelial changes in oral mucosa is a combination of visual examination and palpation (6,8,9). Unfortunately, routine examination for the detection of oral cancer is not practiced as frequently as would be desirable (7,9,10).

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
J A D A

Putting it all together...

COVER STORY

Evidence-based clinical recommendations regarding screening for oral squamous cell carcinomas

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The American Cancer Society (ACS) estimated that there would be 35,720 new cases of cancer of the oral and pharyngeal region in the United States in 2009, with 7,600 deaths from the disease.[1] When focusing specifically on the oral cavity, ACS estimated that in 2009, there would be 23,110 new cases of cancer of the oral cavity (hereafter referred to as "oral cancer") and 5,370 deaths.[1] Nearly 90 percent of these malignancies are squamous cell carcinomas.[2] More than 97 percent of U.S. cases of these cancers occur among adults 35 years and older.[3] Although the incidence rate (IR) of oral and pharyngeal cancers is decreasing overall, the IR of cancers of the tongue, oropharynx and tonsil is increasing.[3] The 2002–2006 age-adjusted (to the 2000 U.S. population) IR of oral and pharyngeal cancers in the United States was 10.3 per 100,000 per year. The age-adjusted IR was more than twice as high among men (15.9) as among women (6.0), as was the mortality rate (men, 4.0; women, 1.5).[3]

ABSTRACT

ARTICLE 1

Background. This article presents evidence-based clinical recommendations developed by a panel convened by the American Dental Association Council on Scientific Affairs. This report addresses the potential benefits and potential risks of screening for oral squamous cell carcinomas and the use of adjunctive screening aids to visualize and detect potentially malignant and malignant oral lesions.
Types of Studies Reviewed. The panel members conducted a systematic search of MEDLINE, identifying 332 systematic reviews and 1,499 recent clinical studies. They selected five systematic reviews and four clinical studies to use as a basis for developing recommendations.
Results. The panel concluded that screening by means of visual and tactile examination to detect potentially malignant and malignant lesions may result in detection of oral cancers at early stages of development, but that there is insufficient evidence to determine if screening alters disease-specific mortality in asymptomatic people seeking dental care.
Clinical Implications. The panel suggested that clinicians remain alert for signs of potentially malignant lesions or early-stage cancers while performing routine visual and tactile examinations in all patients, but particularly in those who use tobacco or who consume alcohol heavily. Additional research regarding oral cancer screening and the use of adjuncts is needed.
Key Words. American Dental Association (ADA); biopsy; brush; cancer; carcinoma; squamous cell; evidence-based dentistry; mouth neoplasms; oral cancer; practice guidelines.
JADA 2010;141(5):509-520.

Recommendations of the American Dental Association Council on Scientific Affairs Expert Panel on Screening for Oral Squamous Cell Carcinomas,* based on evidence.

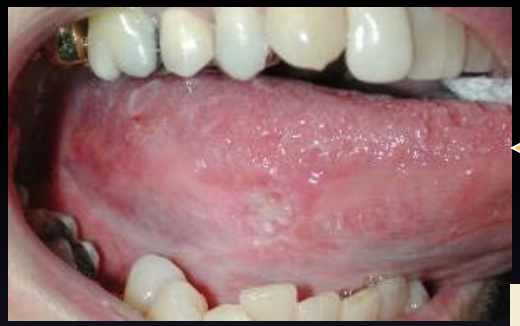
Screening for oral cancer is one component of a thorough hard-tissue and soft-tissue examination that follows patient history and risk assessment

TOPIC	RECOMMENDATION	CLASSIFICATION
Screening During Routine Examinations†	The panel suggests that clinicians remain alert for signs of potentially malignant lesions or early-stage cancers in all patients while performing routine visual and tactile examinations, particularly for patients who use tobacco or who are heavy‡ consumers of alcohol	D
Follow-up for Seemingly Innocuous Lesions	For seemingly innocuous lesions, the panel suggests that clinicians follow up in seven to 14 days to confirm persistence after removing any possible cause to reduce the potential for false-positive screening results	D
Follow-up for Lesions That Raise Suspicion of Cancer and Those That Are Persistent	For lesions that raise suspicion of cancer or for lesions that persist after removal of a possible cause, the panel suggests that clinicians communicate the potential benefits and risks of early diagnosis Considerations include the following: ▬ that even suspicious lesions identified during the course of a routine visual and tactile examination may represent false positives; ▬ that clinical confirmation (a second opinion) can be sought from a dental or medical care provider with advanced training and experience in diagnosis of oral mucosal disease so as to reduce the potential for a false-positive or false-negative oral cancer screening result; ▬ that a malignancy or nonmalignancy can be confirmed only via microscopic examination that requires a surgical biopsy; ▬ that a decision to pursue a biopsy to confirm the presence or absence of malignancy should be made in the context of informed consent	D
Use of Lesion Assessment Devices	Although transepithelial cytology has validity in identifying disaggregated dysplastic cells, the panel suggests surgical biopsy for definitive diagnosis	D

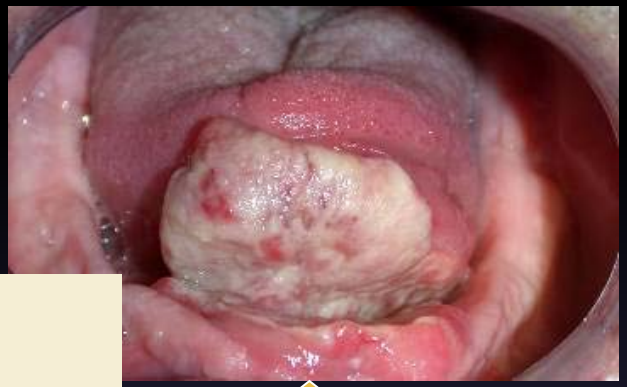
Additional research regarding oral cancer screening and the use of adjuncts is needed.

TNM

T= Tumor Size



T1

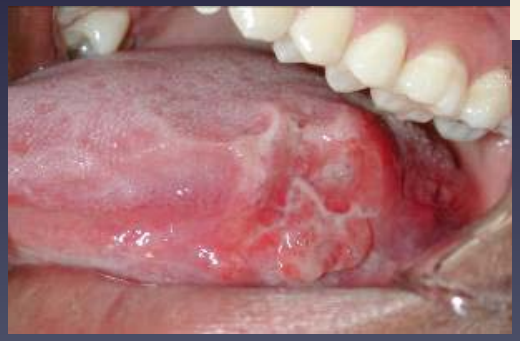


T3

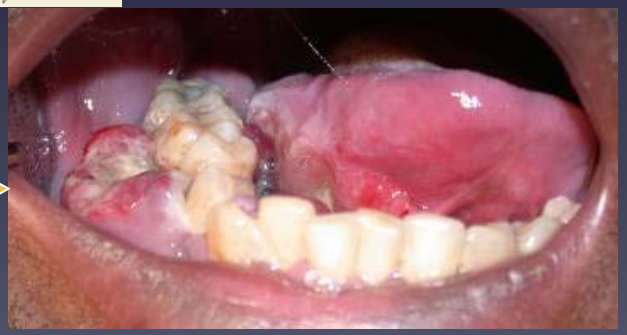
Primary Tumor
(T)

TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ
T1	Tumor 2 cm or less in greatest dimension
T2	Tumor more than 2 cm but not more than 4 cm in greatest dimension
T3	Tumor more than 4 cm in greatest dimension
T4	Tumor (lip) invades adjacent structures (eg, through cortical bone, tongue, skin of neck) Tumor (oral cavity) invades adjacent structures (eg, through cortical bone, into deep [extrinsic] muscle of tongue, maxillary sinus, skin)

T2

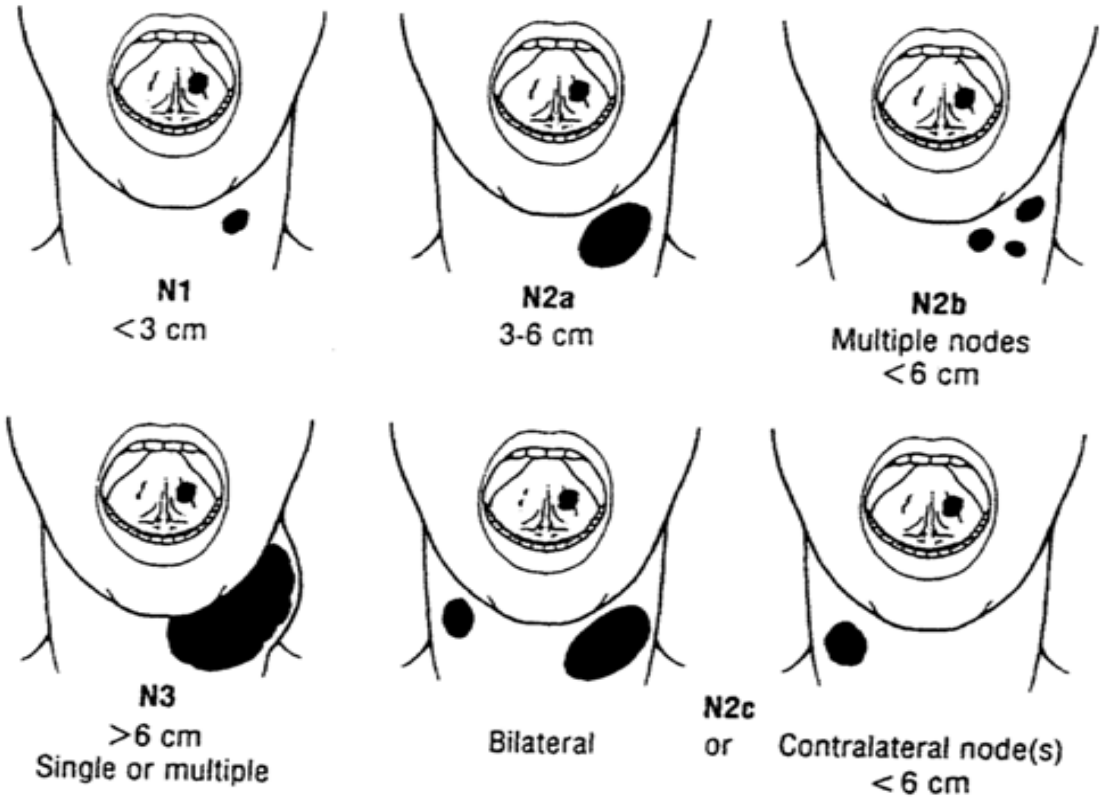


T4



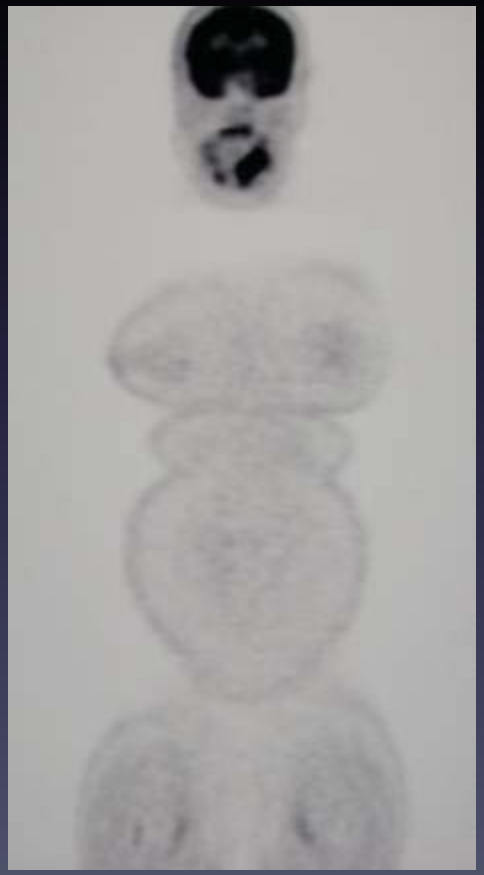
SOMS

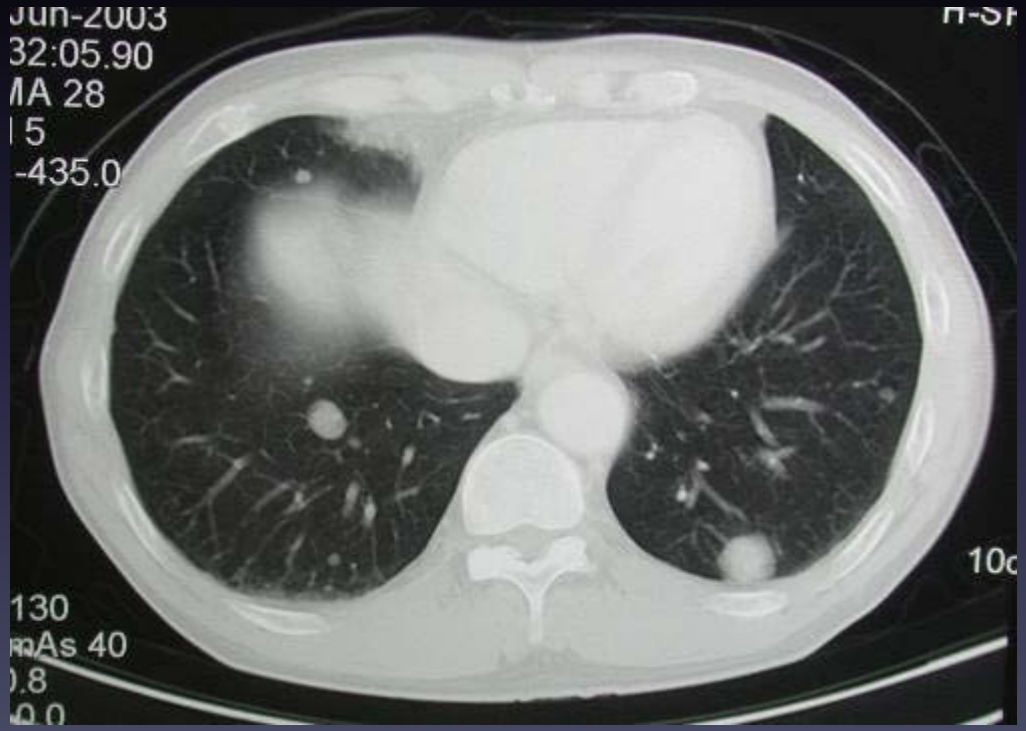
TNM N= Cervical Lymph Nodes



TNM M= Metastasis

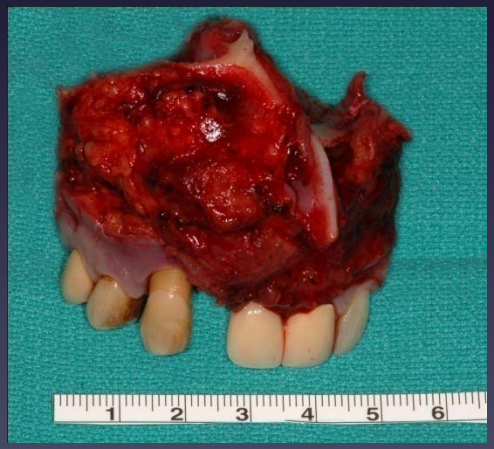
- M0: No distant mets
- M1: + distant mets





Stage I
T1, No, Mo

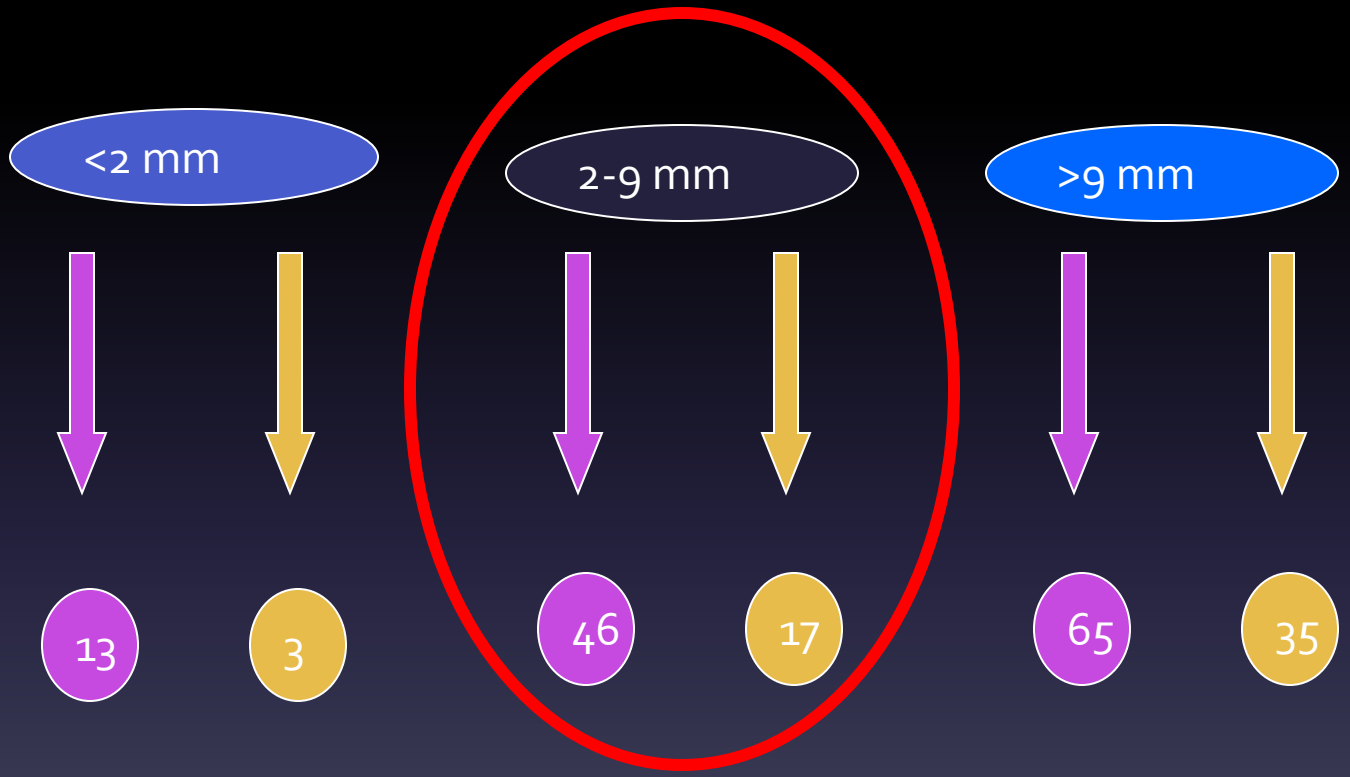
Stage II
T2, No, Mo



Stage III
T3, No, Mo
T1, N1, Mo
T2, N1, Mo
T3, N1, Mo

Stage IV
T4, No, Mo
T1, N2, Mo
T2, N2, Mo
T3, N2, Mo
Any T, N3, Mo
Any T, any N, M1

Risk of lymph node metastasis and mortality in relation to thickness of primary lesions for T_1 and T_2 SCCA



% with lymph node mets

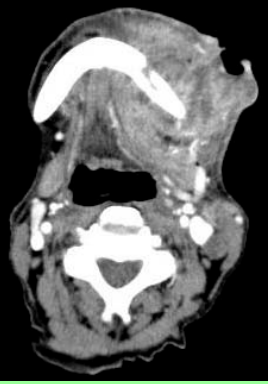
% dead of disease

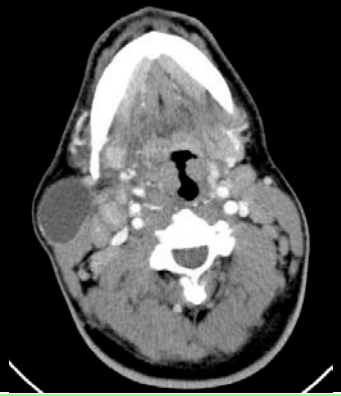
Shah J, Zelefsky MJ; Head & Neck Cancer: a Multidisciplinary Approach, 2004

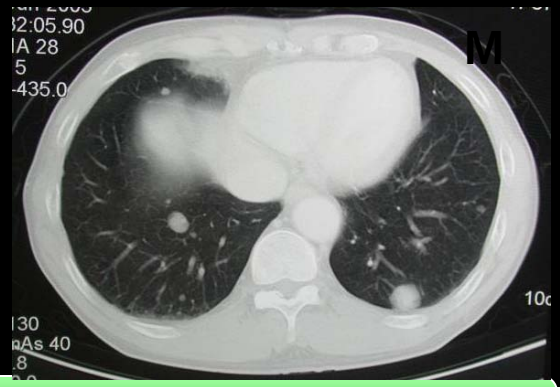
Workup

- Biopsy & assess size (TNM)
- Status of cervical lymph nodes (TNM)
  - Single most important prognostic indicator[1]
  - Decreases 5-year survival by ~50%[2]
  - CT scan + palpation (~91% sensitive)[3]
- Screen for distant mets (TNM)
  - Liver function enzymes
  - Chest xray vs. CT chest
- Dental exam (XRT?)
- *Don't* extract loose/painful teeth adjacent to cancer!

[1]*Johnson JT, et al. Arch Otolaryngol 1981*
[2]*Landis SH, et al. CA Cancer J Clin 1999*
[3]*Merritt RM, et al. Clin Nucl Med 1991*







TNM Staging

Early Stage (I – II)	Locoregionally advanced (stage III – IVB)	Metastatic (stage IVC)
Treatment modality		
Surgery	Surgery	Chemotherapy
or	Radiotherapy	
Radiotherapy	Chemotherapy	

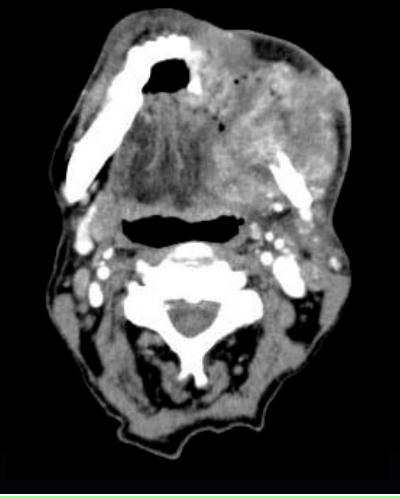
Management of Oral Cancer

By Sub-Site

SOMS

Surgical Management of Oral Cancer

- Sub-sites
  - Access for sound oncologic resection
- Neck
  - Selective neck dissection (level I to III)
- Reconstruction
  - Free tissue transfer



Locoregionally advanced SCCHN

Resectable Tumor

Surgery

Chemotherapy

Radiotherapy

Unresectable Tumor

Chemotherapy

Radiotherapy

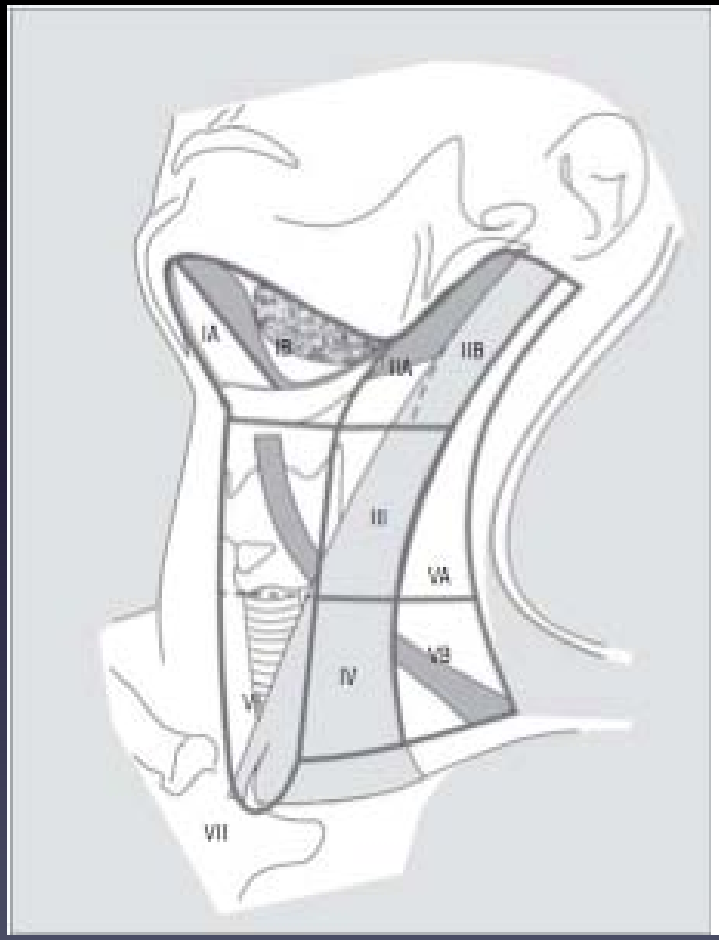
SOMS

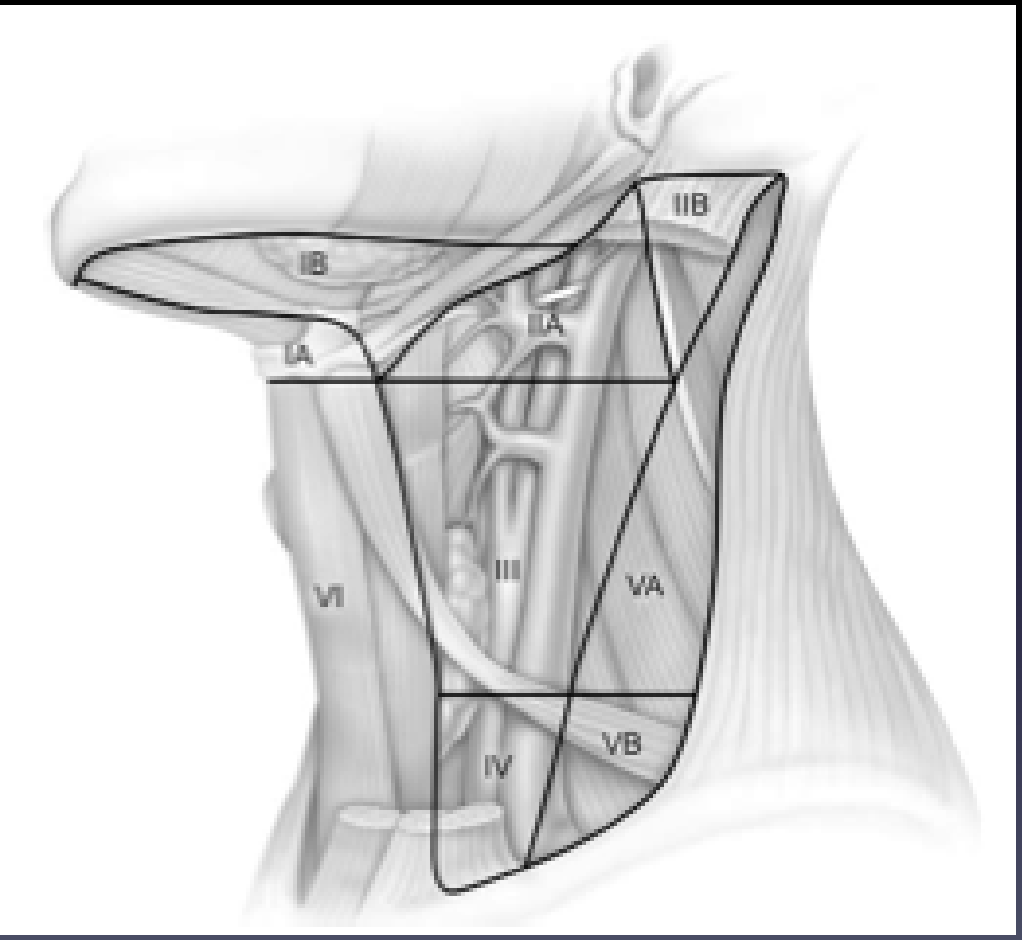
Management of the Neck in Oral Cancer

SOMS

Management of the Neck

Nodal Levels





Management of the Neck in Oral Cavity Cancer

Classification of Neck Dissection

1. Radical Neck Dissection
2. Modified Radical Neck Dissection
3. Selective Neck Dissection

each variation is depicted by "SND" and use of parentheses to denote the levels or sublevels removed

4. Extended Neck Dissection

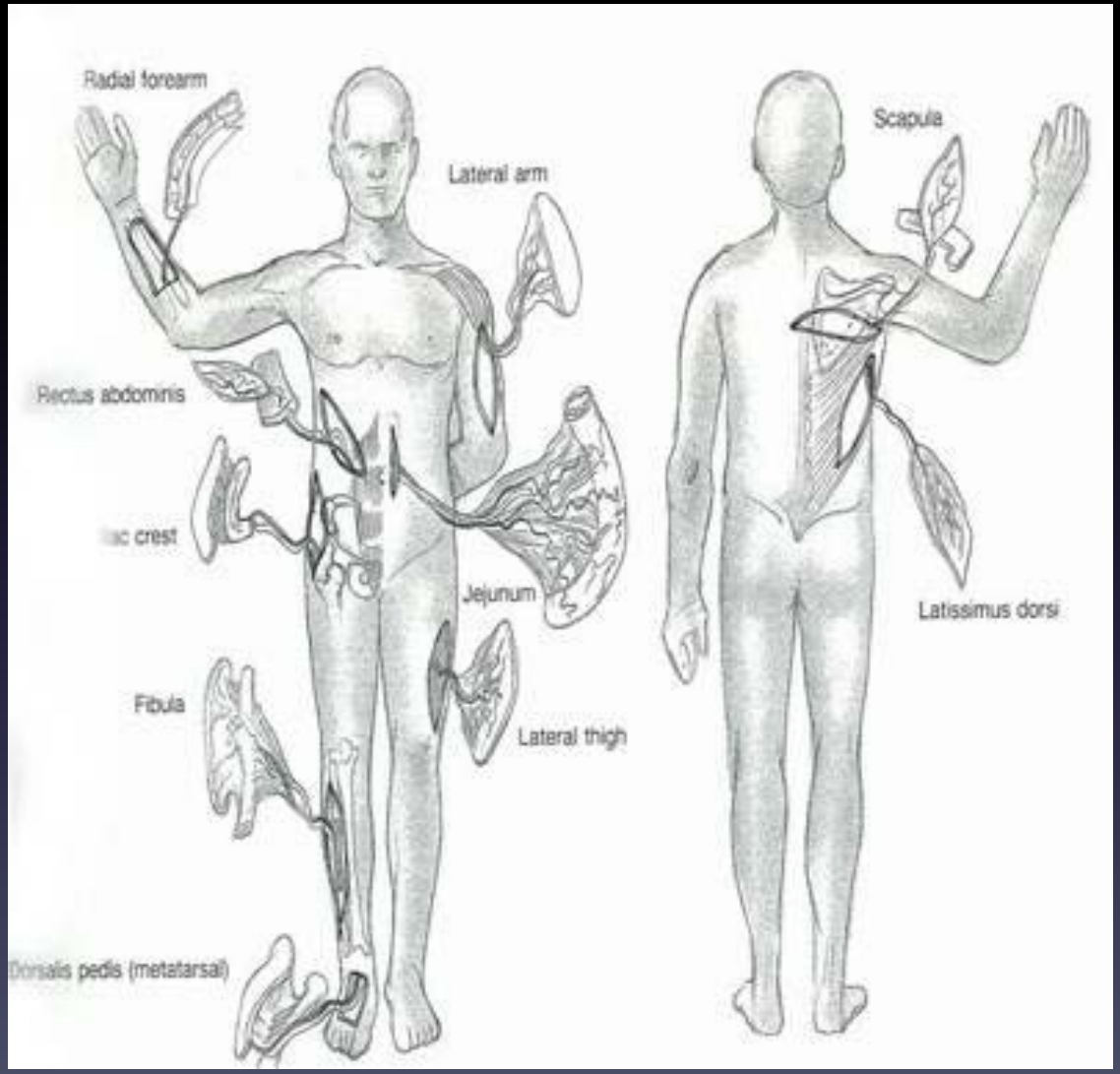
Robbins KT, et.al. Arch Otolaryngol Head Neck Surgery 2002

SOMS

Microvascular Tissue Transfer

- Transplant within your own body
- Skin, muscle, bone or any combination
- Tissue cut from its original blood supply and anastomosed to a new one
- Living tissue withstands radiation therapy
- Reconstruction performed during same operation as cancer removal

Microvascular Tissue Transfer



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SOMS