

TITLE: CATCH THE CRAB BEFORE IT BITES!!!

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INTRODUCTION

Cancer is one of the deadliest diseases affecting the mankind causing 6 million death every year, worldwide. Oral cancer is the number one among all cancers in male patients. This carcinoma accounts for almost 40% of all cancers in the Indian subcontinent.

It takes only a 90-second visual and tactile examination to achieve early detection in basic oral cancer examination. Oral cancer screening has relied upon the conventional oral examination of patients. Failure to diagnose oral cancer is rising, and can prove difficult to defend.

New technologies have provided an exciting new array of clinical diagnostic tools for localizing or emphasizing abnormal mucosa in the dental clinic. Some of these technologies claim to identify atypical cells prior to biopsy, even before there are clinically visible changes. Hence allow a more confident assessment of risk and localization of the most "suspicious" area to biopsy.

CONVENTIONAL ORAL CANCER EXAMINATIONS AND DIAGNOSTIC TECHNOLOGIES

A variety of commercial diagnostic aids are available to potentially assist in the screening of healthy patients for evidence of otherwise occult cancerous change or to assess the biologic potential of clinically abnormal mucosal lesions. The prevention of oral cancer and its associated morbidity and mortality hinges upon the early detection of neoplastic lesions, allowing for histologic evaluation and treatment as necessary.

Standard screening test

Conventional Oral Examination under normal (incandescent) light

Established diagnostic adjuncts

Vital Staining (Toluidine Blue)

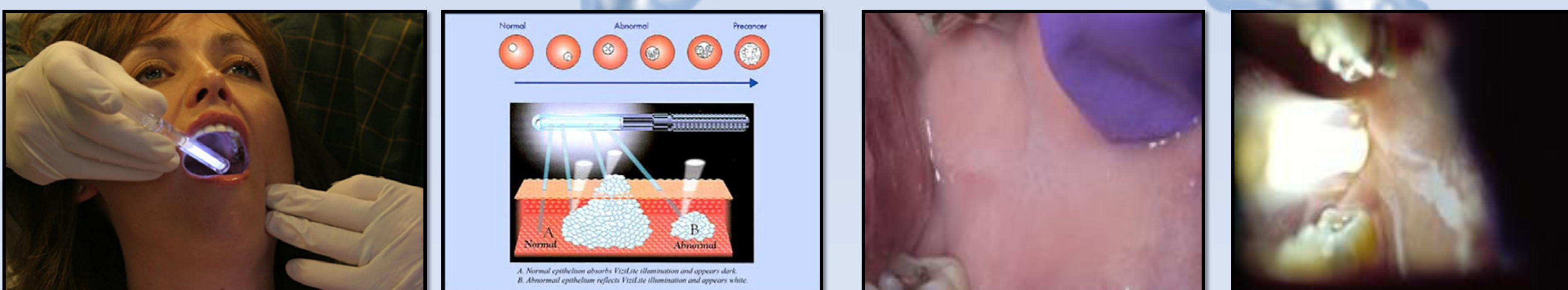
Brush Cytology



Evolving New Imaging Devices of Clinical Modalities

Light-based detection systems

- Chemiluminescence (reflective tissue fluorescence)
- ViziLite Plus, MicroLux DL and Orascoptic

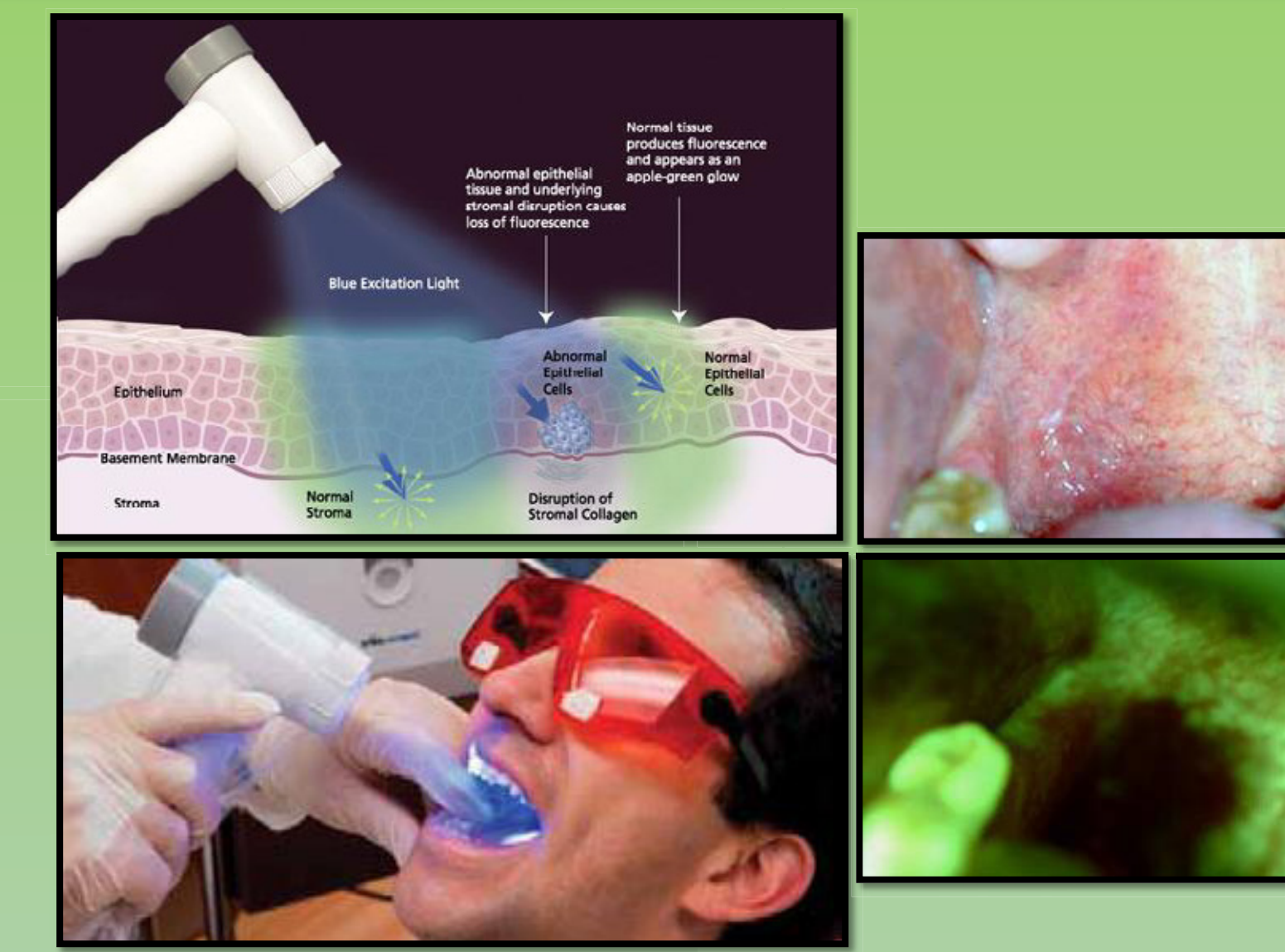


Other Imaging Devices

Spectroscopy

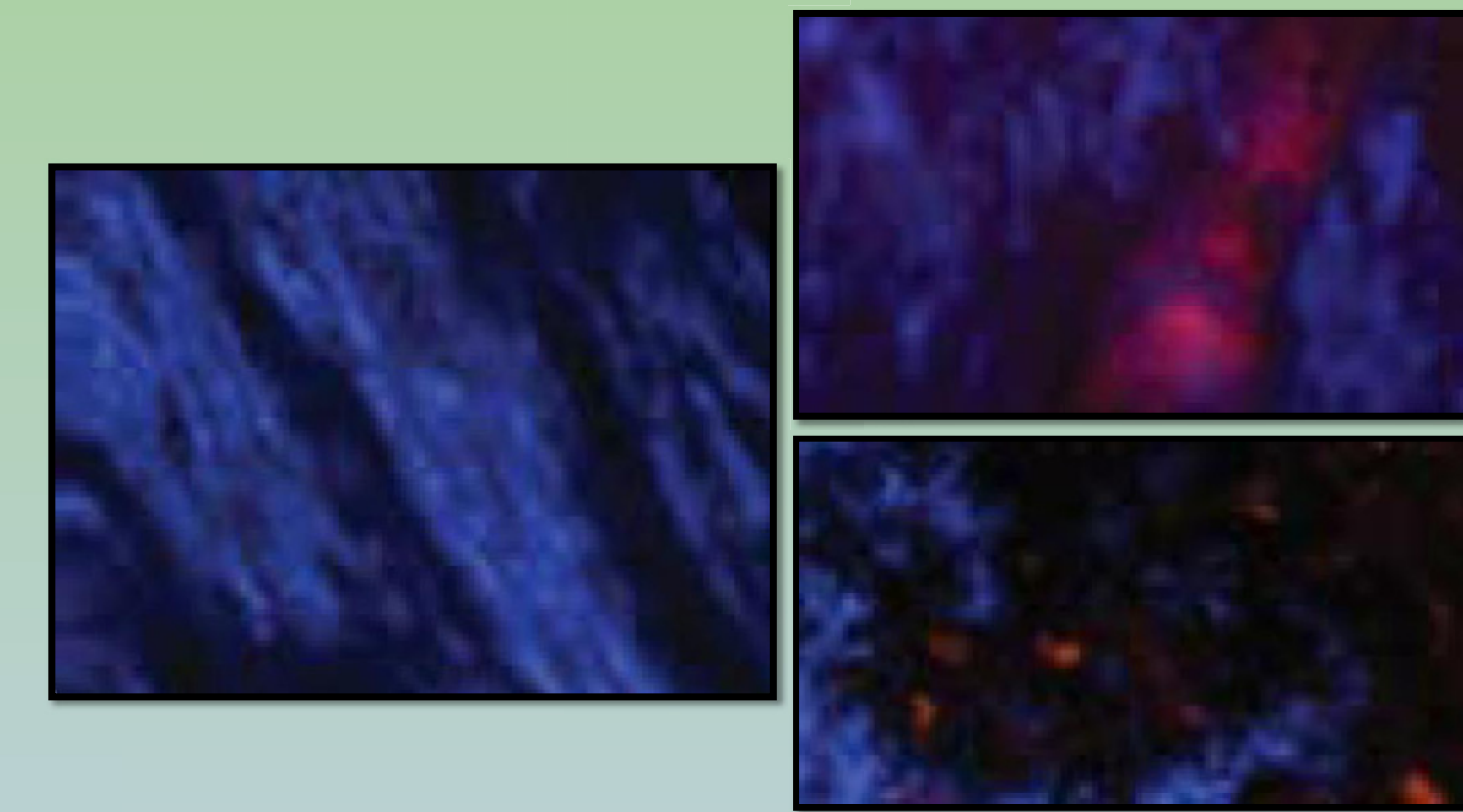
- VELscope (narrow-emission tissue fluorescence)

Tissue autofluorescence changes with changes in the structure & metabolism of the epithelium, as well as changes of subepithelial stroma alter their interaction with light.



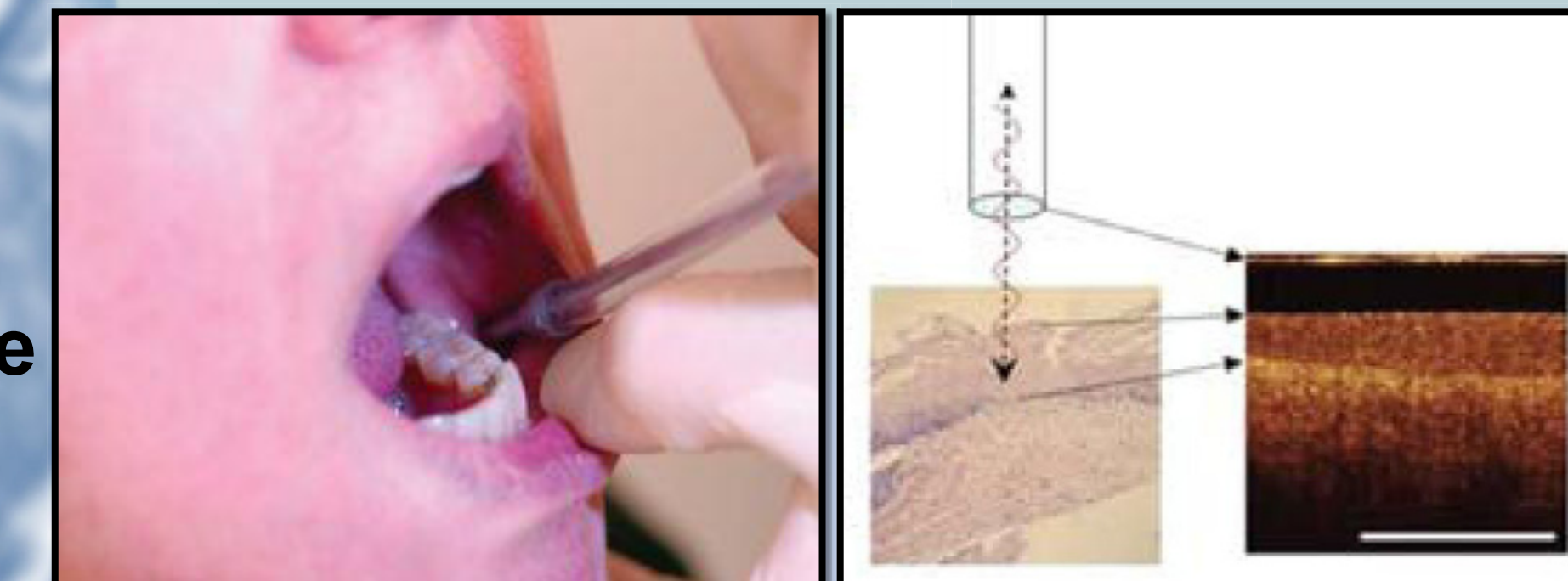
In vivo confocal or multiphoton imaging

It resembles histological tissue evaluation, except that 3-D subcellular resolution is achieved noninvasively and without stains. Multiphoton microscopy resembles confocal, but affords a greater tissue penetration depth, the use of many different wavelengths of light, and less tissue heating.



Optical coherence tomography

OCT is a high-resolution optical technique that permits non-invasive imaging of surface and subsurface tissues. The tissue penetration depth of 1 mm to 2 mm is attained and is suitable for the oral mucosa. Potential for near histopathological level resolution and close correlation with histologic appearance can be seen.



Emerging New Clinical Modalities for Early Detection

Saliva as a diagnostic tool (UCLA Oral Fluid NanoSensor Test (OFNASET))

Salivary biomarkers like DNA, RNA, and proteins are used as a predictive measure for systemic disease. OFNASET is a handheld, automated, easy-to-use integrated system that will enable simultaneous and rapid detection. Four genes (IL-8, ornithine decarboxylase, spermidine acetyltransferase and IL-1 β) are able to discriminate and predict whether a saliva sample was from a patient with cancer or from a healthy subject.



Lab on a chip

Brush-biopsy sample is placed on the lab-on-a-chip for analysis. Cells pass through mini-fluidic channels to come in contact with "biomarkers" that react only with specific types of diseased cells. Healthy and diseased cells can be distinguished from one another by the way they glow in response to the LEDs.

Fluorescent probes

Topical Spray of rapidly activatable, cancer-selective fluorescence imaging probe, γ -glutamyl hydroxy methyl rhodamine green (gGlu-HMRG) are useful for enhancing visualization of tumors.

Conclusions:

1. Early detection of oral cancer is the key to survival, and an oral cancer exam is essential for each patient every time they enter the dental clinic.
2. Emphasis on oral cancer prevention and early detection should be incorporated into the dental school curriculum

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