Microlux and *in vivo* confocal microscopy in the diagnosis of potentially malignant and malignant lesions of the oral cavity

Sir,

Oral cancer causes several deaths throughout the world each year. The high mortality rate attributed to oral cancer is mostly due to late detection or diagnosis of potentially malignant and malignant lesions of the oral cavity. Currently, several screening modes are available to the clinical fraternity to detect these lesions. Among them, the recently emerging technologies include Microlux and *in vivo* confocal microscopy.

Microlux DL is based on the principle of tissue reflectance. In this technique, the patient rinses 1% acetic acid solution for 60 s in the oral cavity.[1] The acetic acid rinse eliminates surface debris and dehydrates the epithelial cells which cause their nuclei to appear prominent.[2] The room light should be lowered at the start of the procedure. The oral cavity is then examined with the help of blue-white light (440 nm) generated by a battery operated light emitting diode fiber optic source.[1] The normal oral epithelium will visually appear as light bluish, whereas the abnormal epithelium as a distinct aceto-white.[3] A recent study concluded that Microlux aids in the diagnosis of oral premalignant and malignant lesions.[4] Microlux does not distinguish between benign and malignant lesions. However, it increases the probability of detecting the lesion and revealing new lesions when compared with conventional oral examination. Microlux is a promising adjunct screening device in this direction.[1]

Confocal microscopy is a reflectance imaging technique in cell biology.[5] It is a cost effective technique and can be used in developing countries.[6] It has the advantage of optical sectioning and high-resolution imaging by blocking the light originating from tissue layers above and below the focal plane.[3] *In vivo* confocal images from the oral cavity using a miniaturized fiber optic confocal reflectance microscope shows the characteristic features such as nuclear irregularity, enlargement, crowding, changes in nuclear to cytoplasmic ratio, changes in capillary network and spacing, which is used to differentiate oral squamous cell carcinoma from normal oral mucosa.[7] It helps to acquire high-resolution images in real time to evaluate morphological changes in tissues in the cellular level. It uses a diode laser as a source of monochromatic and coherent light. The basic principle lies in the difference in reflectivity of the tissues.[8] Contrast is based on differences in refractive index, which can be enhanced using simple contrast agents such as acetic acid or using fluorescent dyes such as fluorescein and 5-aminolevulinic acid. Furthermore, exogenous contrast agents such as topical acriflavine and intravenous fluorescein can be used.[9] The advantage of this technique is that it requires no surgical procedure and histopathologic sectioning and staining.[10] A recent study validated the use of this technique to evaluate tissue architecture and cell morphology of the oral cavity.[8]

Though the techniques especially *in vivo* confocal microscopy are in the developmental stage, they are promising and advantageous in the early detection of oral cancer. More research and progress in biomedical instrumentation technology may maximize the efficiency of these emerging technologies, leading to decreased mortality rate due to oral cancer.

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