

Medical > In Vivo > Oral investigations

9

A novel multimodal optical imaging system for early detection of oral cancer.

Malik BH, Jabbour JM, Cheng S, Cuenca R, Cheng YS, Wright JM, Jo JA, Maitland KC. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2016 Mar;121(3):290-300.e2. doi: 10.1016/j.oooo.2015.10.020.

ABSTRACT

OBJECTIVES: Several imaging techniques have been advocated as clinical adjuncts to improve identification of suspicious oral lesions. However, these have not yet shown superior sensitivity or specificity over conventional oral examination techniques. We developed a multimodal, multi-scale optical imaging system that combines macroscopic biochemical imaging of fluorescence lifetime imaging with subcellular morphologic imaging of reflectance confocal microscopy for early detection of oral cancer. We tested our system on excised human oral tissues. **STUDY DESIGN:** In total, 4 tissue specimens were imaged. These specimens were diagnosed as either clinically normal, oral lichen planus, gingival hyperplasia, or superficially invasive squamous cell carcinoma. The optical and fluorescence lifetime properties of each specimen were recorded. **RESULTS:** Both quantitative and qualitative differences among normal, benign, and squamous cell carcinoma lesions can be resolved with fluorescence lifetime imaging reflectance confocal microscopy. The results demonstrate that an integrated approach based on these two methods can potentially enable rapid screening and evaluation of large areas of oral epithelial tissue. **CONCLUSIONS:** Early results from ongoing studies of imaging human oral cavity illustrate the synergistic combination of the 2 modalities. An adjunct device based on such optical characterization of oral mucosa can potentially be used to detect oral carcinogenesis in early stages. Copyright © 2016 Elsevier Inc. All rights reserved. PMID:26725720