Poster presentation

Optical diagnostic techniques in the head and neck

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Optical biopsies can be acquired through different modalities; each has it own mechanism of action and requires different modes of data analysis. However, they share the ability of being able to provide a real time, non-invasive and *in situ* optical signature. Most of these techniques have been applied only in clinical trials and are yet to be employed in clinical practice, with the exception of fluorescence spectroscopy. Results from these trials are very promising, and current results indicate the possibility of these techniques being applied in clinical practice in the next few years. This could have a great impact on diagnostics, by reducing the histopathology workload, reducing patient's anxiety, and allowing rapid surgical or adjuvant intervention.

Elastic scattering spectroscopy (ESS) has proved to be a promising method for detecting premalignant and malignant changes in oral tissues, with high sensitivity and specificity. Several head and neck tissues, including lymph nodes and bones, have been interrogated using ESS, which detects changes at the cellular and subcellular level, with very promising results. Fluorescence spectroscopy, unlike ESS, can identify changes through the fluorophores detected in the tissue, and has been found to be very accurate in detecting oral dysplasia. Raman spectroscopy can detect biochemical changes in tissue, but it has limited clinical applications due to its weak signal. The first application of Microendoscopy in the head and neck was described by Upile et al. at University College Hospital, London; resected tumour margins were examined and the results were impressive; however, a fundamental understanding of histopathology is essential for achieving a high sensitivity and specificity.