Dental Health: Current Research

Short Communication A SCITECHNOL JOURNAL

Oral Cancer Detection: Cutting-edge Technologies and Diagnostic Approaches

Zhao Wei*

Department of Orthodontic, Chung Shan Medical University Hospital, Taichung, Taiwan

***Corresponding Author:** Zhao Wei, Department of Orthodontic, Chung Shan Medical University Hospital, Taichung, Taiwan; E-mail: wei@zhaaa.edu

Received date: 23 November, 2024, Manuscript No. DHCR-24-160258;

Editor assigned date: 25 November, 2024, PreQC No. DHCR-24-160258 (PQ);

Reviewed date: 09 December 2024, QC No DHCR-24-160258;

Revised date: 17 December, 2024, Manuscript No DHCR-24-160258 (R);

Published date: 24 December, 2024, DOI: 10.4172/2470-0886.1000235.

Description

Oral cancer remains a major health concern worldwide, with a significant impact on both survival rates and quality of life. Despite advances in treatment, early detection is crucial for improving outcomes and survival rates. Traditionally, oral cancer detection has relied on visual and physical examinations, but recent technological advancements have transformed diagnostic approaches, allowing for more accurate and early detection. Oral cancer, which includes cancers of the lips, tongue, cheeks, floor of the mouth, hard palate and throat, is often diagnosed at later stages when the disease has already spread, making treatment more challenging. Early-stage oral cancers, however, have a higher survival rate, highlighting the critical importance of early detection and timely intervention. Historically, oral cancer was detected through regular clinical examination, including palpation (feeling for lumps) and visual inspection for unusual changes in the mouth. However, these traditional methods often miss early signs of cancer, which can be microscopic and asymptomatic. As a result, there is a growing need for more sophisticated technologies that can detect oral cancer at an earlier stage when treatment options are more effective and less invasive. While new technologies have emerged, traditional diagnostic methods remain the backbone of oral cancer detection. These methods include:

Dentists and healthcare providers perform routine oral exams, looking for signs such as persistent sores, lumps, ulcers, or unusual changes in the mucosa. This can help identify abnormalities, but it relies heavily on the clinical experience of the examiner. If a suspicious lesion is identified, a biopsy is often performed to confirm the presence of cancer. During a biopsy, a small sample of tissue is removed from the suspicious area and examined under a microscope for cancerous cells. This remains the gold standard for definitive diagnosis, but it is invasive and often performed after abnormalities are detected. Despite their utility, these methods are often not sufficient for detecting oral cancer at the earliest stages. Therefore, newer technologies and diagnostic approaches have been developed to improve early detection rates.

Positron Emission Tomography (PET) scans are used in conjunction with CT or MRI scans to identify areas of abnormal metabolic activity, which is common in cancer cells. By injecting a small amount of radioactive glucose, PET scans can highlight areas where cancer cells are actively growing, allowing for early detection of oral tumors. Magnetic Resonance Imaging (MRI) is another imaging technique that provides detailed images of soft tissues, making it particularly useful for detecting tumors in the mouth, tongue and throat. MRI is also useful in assessing the extent of cancer spread, which is crucial for treatment planning. Optical Coherence Tomography (OCT) is a non-invasive imaging technique that uses light waves to capture high-resolution, cross-sectional images of tissues. This method allows for the detection of structural changes in tissues that may indicate precancerous lesions or early-stage oral cancer.

Conclusion

The detection of oral cancer at an early stage is critical for improving survival rates and minimizing the impact of treatment. Innovative technologies, including fluorescence-based devices, salivary biomarker analysis, molecular imaging and artificial intelligence, are transforming the way oral cancer is diagnosed. As research continues to progress, these innovations will likely lead to more accurate, non-invasive and accessible diagnostic tools that will play a key role in combating oral cancer and improving patient care. Early detection remains the most effssective strategy for reducing the burden of oral cancer and improving patient outcomes.

Citation: *Wei Z (2024) Oral Cancer Detection: Cutting-edge Technologies and Diagnostic Approaches. Dent Health Curr Res 10:5.*