Guest Editorial

Oral Cancer Screenings: Have We turned the Corner?

Cancer is the second most cause of morbidity and mortality in the world today after cardiovascular diseases. Six million people die due to cancer each year. Detecting cancer in its early stages dramatically increases the survival rates as compared to its detection in later stages.[1] Most major cancers are tracked by their 5-year survival rate—the percentage of patients that are diagnosed with cancer and are still alive after 5 years. With advancements of technologies and screenings, most cancers have a survival rate greater than 50%, a number that is steadily increasing. On the contrary, there are some cancers that have a survival rate that is surprisingly low.

When looking at the 5-year survival rates of the worst cancers (pancreas 7%, liver 17%, lung 17%, esophagus 18% and stomach 28%), there is a common trend: these are all internal organs with no accepted screening protocol, and symptoms only occurring until late stages and metastasis. Not that this is acceptable, but it is understandable given the complexities of regular screenings for these organs. What is not understandable is that the 5-year survival rate of oral cancer has not improved in decades. With easy to access tissue of the oral cavity, along with advancements in technology and protocols, there are no excuses for oral cancer to be discovered in late stages, regardless of what country it may be.

Oral cancer, also called 'head and neck cancer', has a low 5-year survival rate of 63%, even in developed parts of the world.[2] The reason for the low survival rate is that the majority of oral cancers are discovered in the latter stages of the disease, often after it has metastasized.[3] In settings with low resources, a similar low survival rate exists. However, this author believes that the similarity in the mortality rates are due to different reasons depending on the resource setting.

In the United States, e.g. the *de facto* medical professional to identify oral cancer is the dentist. For almost a decade, the advanced technology of fluorescence has been on the market as a general screening tool, but this technology occupies less than 10% of the American dental offices. At American dental schools there may be a few of instruction hours covering pathology and cancer, while the vast majority of time is dealing with teeth. As a general rule, American dentists are uncomfortable talking with their patients about the dreaded 'C' word; life and death discussions are outside their comfort zone. It is a difficult task introducing them to technology and protocols outside of their training and expertise. Lastly, the lack of insurance reimbursement is an impediment to implementing this technology. Dental insurance is an unpredictable creature which may not compensate the dental office for their time. This is why many offices have moved to a strict fee-for-service model. This also is problematic in that trying to amortize a multithousand dollar piece of equipment from a cash pay patient is difficult. Furthermore, an additional cost of $2.50 USD per patient in disposable costs provide a further challenge to acceptance.

From the prospective of a low resource setting, the major impediment to screening with the latest technology is the price of the equipment. There exists ample demand to screen from healthcare providers, but the high cost of the equipment in addition to the disposable costs has slowed the utilization of fluorescence technology to these parts of the world. When the VELscope was released, its cost of about $7,000 USD was cost-prohibitive even in Canada, United States and the Europe. Even just 2 years ago, the two leading fluorescence devices on the market, VELscope Vx and Identafi, were both around $3,000 USD, in addition to the $2.50 USD disposable cost per patient.

Eventually, a market disruptor comes along to address many of the previous objections. Recently, Forward Science Technologies (FST) LLC was formed to develop a device (OralID™) with the same technology as the other devices in the market, but at a much lower price point with no consumables .

However, we need to be unambiguous in the importance that this technology does not diagnose or even 'find' cancer. The technology works by highlighting abnormal tissue. Tissue which has an increased metabolic activity and/or changes in the underlying collagen cross-links will exhibit a loss of fluorescence (LOF). It should be noted that many conditions can have the same appearance as the LOF, as cancer or dysplasia. To appropriately triage the LOF, clinicians need to perform a differential diagnosis and use their clinical training, experience and intuition. The OralID protocol recommends a 2 to 3 weeks follow-up examination after the initial observation of the LOF. As the

oral tissue repairs itself quickly, a continuing LOF still observed at the follow-up visit indicates that the tissue is not healing and additional follow-up may be warranted.

Early on, some of the first companies have created a misconception of adjunctive/fluorescent devices by claiming they could diagnose cancer. After seeing a LOF, the dentist would refer the patient to a specialist for a biopsy. After a couple of iterations, where the biopsy results were negative, the dentist would become jaded and the technology earned somewhat a poor reputation. Aggressive and misleading marketing, lack of a proper screening protocol and poor user-training contributed to early adopters weary of the technology.

The clinician was then left with a quandary: do I monitor the LOF for an arbitrary timeframe, use a brush biopsy test with a wide range of reported sensitivity (7.9–100%) and specificity (29–100%), or send the patient out for a biopsy?[4-6]

It is interesting to watch a company (albeit from the inside) react to market forces and demand. In less than a year after the Food and Drug Administration (FDAs) clearance of the OralID, FST launched a diagnostic test (CytID™) which can be performed by the clinician, typically on the follow-up visit if the LOF is still present. The process called 'exfoliative, liquid-based cytology' involves harvesting mucosal cells by a soft brush or swab. The cells are then prepared under a proprietary process and read by a pathologist. While not a scalpel biopsy replacement, the liquid-based, exfoliative cytology test is an excellent intermediary test where independent studies report admirable sensitivities (77–95.1%) and specificities (90–99.5%).[9,10] Remmerbach concludes, 'Cytologic investigation of (exfoliative cytology) from macroscopically suspicious oral lesions is an easily practicable, cheap, quick, non-invasive, painless and accurate screening method that may help to reduce the occurrence of invasive and thus fatal squamous cell carcinomas.'[7,8,10]

While the manufacturers of OralID and CytID are not bringing unique devices to the market, they have innovated current technologies to create affordable and user friendly products to better serve clinicians and patients. The use of OralID in primary screening centers including dental offices and general medicine settings will serve patients well in providing an advanced tool to find premalignant lesions. Additionally, the marked cost savings of the OralID in the developing world, where the comparative high cost of equipment is the primary hindrance to the latest technologies, will allow dramatic increase in the number of people that can be screened.[11] The widespread use of this cost effective and results-oriented device will open new dimensions in the screening and treatment for oral cancer patients. This innovative device works on the fundamental principle that 'Initial diagnosis influences final prognosis'.

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