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## Tele-screening for early detection of oral cancer during the COVID-19 pandemic era: Diagnostic pitfalls and potential misinterpretations!

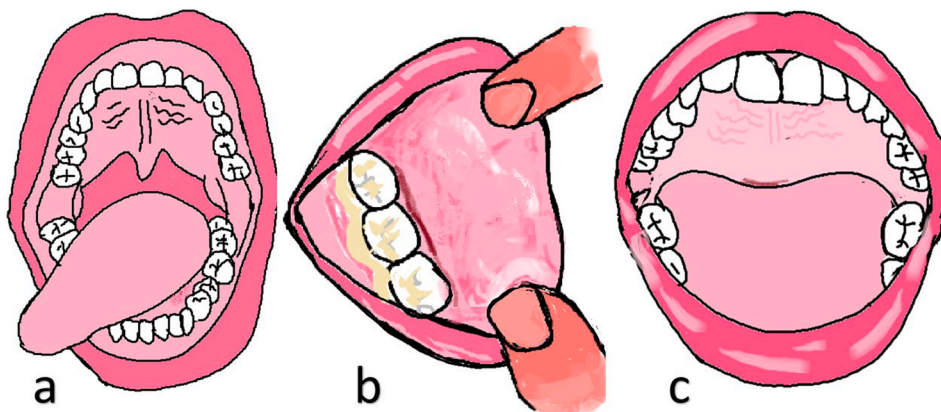
The COVID-19 pandemic has negatively impacted the human race and stupefied the health system. The social distancing norms have necessitated people staying at home and often neglecting their health issues unless they are alarming. Hence diseases that are clinically indolent or innocuous go unnoticed until they reach advanced stages, especially in cases of patients with oral squamous cell carcinoma (OSCC). Even before the pandemic, OSCC was notorious for being diagnosed late. The delay in diagnosis had been attributed to patients' factors like lack of awareness, low socioeconomic status, lack of access to dentists, or the lesion being asymptomatic not necessitating consultation [1]. Inadequate trained oral health care providers, lack of expertise in performing diagnostic tests like a biopsy, limited access to cancer referral centres and treatment are reasons for the professional delay in the diagnosis of OSCC [2]. However, the onset of the pandemic and the set-up of free online teleconsultation by experts raised the hopes of many for easy access to oral health care professionals.

But it cannot be used as an alternative modality for early detection of oral cancer as suggested by DagliNamrata et al [3] because there are several pitfalls in tele-screening, including the clarity of the images, inability to image the inaccessible areas of the oral cavity or correlation with palpatory findings. Since the diagnosis of OSCC is multistep involving a thorough history taking session and meticulous clinical examination, the examination step is inadequate often leading to misdiagnosis [4]. Overestimation of an oral mucosal lesion as OSCC on one hand can lead to considerable psychological trauma and financial hardship, underestimation delays the diagnosis and leads to late detec-

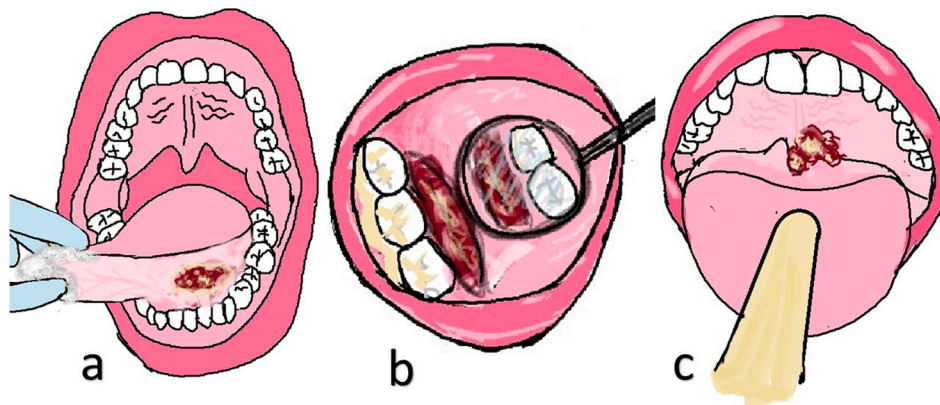
tion adding to the oral cancer burden [5]. The use of artificial intelligence in mobile microscopy has been advocated by few authors but accessibility to such advanced devices in the population at large is questionable [6,7].

To rest our case further, regarding the pitfalls/misinterpretation in tele-screening, a few schematic diagrams are given below. Figure 1 represents three possible case scenarios which the oral physician encounters during tele-screening and terms as benign. The diagram 'a' shows the left lateral border of the tongue, 'b' shows the buccal mucosa and adjoining alveolar sulcus and 'c' shows the palate. [Figure 1] In all of the above, in spite of the patient's complaint, the lesion is missed due to inadequate visibility. The same lesions can be seen in Figure 2 when the tongue is retracted using a gauze piece (a) or the buccal mucosa is retracted by a mouth mirror to show the alveolar sulcus (b) or the tongue is depressed using a tongue blade to show the soft palate/uvula (c). [Figure 2] These simple diagrams speak volumes about misdiagnosis during tele-screening.

OSCC is commonly habit associated but can also occur in its absence. Chronic microtrauma has been attributed to be one of the causes of OSCC and it can be only excluded on proper examination of the teeth/restorations/dentures, etc again pointing towards misinterpretation in tele-screening [8]. Moreover, traumatic ulcers, traumatic ulcerative granuloma with stromal eosinophilia (TUGSE) and malignant ulcers are three similar appearing clinical entities but can only be differentiated by an oral physician again supporting our opinion that tele-screening has potential limitations [9]. Different dental institutes in India in 20,220



**Figure 1.** Schematic diagram representing possible oral lesions on the left lateral border of the tongue (a) buccal mucosa and adjoining alveolar sulcus (b) and the palate (c) as depicted by patient on tele-screening.



**Figure 2.** Schematic diagram showing a visible oral mucosal lesion on retracting the tongue using a gauze piece (a), the buccal mucosa is retracted by a mouth mirror to show the alveolar sulcus (b) and the tongue is depressed using a tongue blade to show the soft palate/uvula (c).

have reported increase in outpatient volumes of OSCC as they were missed during tele-screening during lockdowns [10]. Even it has been hypothesized that the psychologic impact of lockdowns has affected the psychological and neuroendocrine responses of the brain increasing the prevalence of OPMDs/OSCC [11].

The oral cavity has a complex anatomy making it clinically inaccessible and more difficult to click pictures. Even oral physicians take up training in dental photography and with experience they master the art of taking good clinical pictures of oral lesions. The alveolar mucosa/buccal sulcus, retromolar area and fauces are some of the most complex sites which need to be examined using retraction by fingers/mouth mirror/tongue blades, etc for visualization which is not possible by the patient himself while teleconsultation. Lastly, the palpatory findings like induration, surface irregularities and lymphadenopathy are essential components of the oral cancer diagnostic protocol totally neglected in tele-screening, even underrating OSCC to localised disease as regional lymph node metastasis could not be assessed [12].

Early diagnosis is vital in the prognosis of the OSCC. Hence diagnostic delays need to be avoided and tele-screening can never be an alternative to a meticulous clinical examination. During lockdowns at the peak of the pandemic it was forced on us but with the vaccination drives and decrease in infections, normal clinical examination of patients ought to be carried out and tele-screenings must be avoided in the general interest of the population.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### References

- [1] Lima AM, Meira IA, Soares MS, Bonan PR, Mélo CB, Piagge CS. Delay in diagnosis of oral cancer: a systematic review. *Med Oral Patol Oral Cir Bucal* 2021 Nov 1;26

- (6):e815–24. <https://doi.org/10.4317/medoral.24808>. PMID: 34704975; PMCID: PMC8601633.
- [2] Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68(6):394–424.
- [3] DagliNamrata, Lakshmi T, Rushabh D, Dineshkumar T, Ezhilarasan D. Tele-screening as an alternate modality for early detection of oral cancer. *Oral Oncol* 2022;127:105785. <https://doi.org/10.1016/j.oraloncology.2022.105785>.
- [4] Ranganathan P, Sengar M, Chinnaswamy G, Agrawal G, Arumugham R, Bhatt R, et al. Impact of COVID-19 on cancer care in India: a cohort study. *Lancet Oncol* 2021;22(7):970–6.
- [5] Skandarajah A, Sunny SP, Gurpur P, Reber CD, D'Ambrosio MV, Raghavan N, et al. Mobile microscopy as a screening tool for oral cancer in India: A pilot study. *PLoS ONE* 2017;12(11):e0188440.
- [6] Ilhan B, Guneri P, Wilder-Smith P. The contribution of artificial intelligence to reducing the diagnostic delay in oral cancer. *Oral Oncol* 2021;116:105254. <https://doi.org/10.1016/j.oraloncology.2021.105254>.
- [7] Santos LC, Batista Ode M, Cangussu MC. Characterization of oral cancer diagnostic delay in the state of Alagoas. *Braz J Otorhinolaryngol* 2010;76:416–22.
- [8] Panta P, Misra SR. Chronic mechanical irritation and oral squamous cell carcinoma: A case series. *Oral Oncol* 2022 Jan;124:105669. <https://doi.org/10.1016/j.oraloncology.2021.105669>. Epub 2021 Dec 13 PMID: 34915257.
- [9] Misra SR, Banerjee A, Das R. Traumatic ulcer, TUGSE and malignant ulcer on lateral tongue: A trio of similar clinical entities confounding the oral diagnostician! *Oral Oncol* 2022 Feb;125:105679. <https://doi.org/10.1016/j.oraloncology.2021.105679>. Epub 2021 Dec 21 PMID: 34952399.
- [10] Panta P, Reddy P, Misra SR, Segonds-Pichon A, Patil S. Impact of COVID-19 Lockdown on Oral Oncology-related Outpatient Volume at Indian Dental Institutions. *J Contemp Dent Pract* 2021 May 1;22(5):501–5. PMID: 34318767.
- [11] Waisberg F, Enrico D, Angel M, Chacón M. Cancer Treatment Adaptations in the COVID-19 Era. *JCO Oncol Pract* 2020;16(6):305–7.
- [12] Cruz GD, Le geros RZ, Ostroff JS, Hay JL, Kenigsberg HERBERT, Franklin DM. Oral cancer knowledge, risk factors and characteristics of subjects in a large oral cancer screening program. *J Am Dent Assoc* 2002;133(8):1064–71.

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