

# Imaging in oral cavity cancer: Radiation oncologist prospective!

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## ABSTRACT

Oral cavity cancer is a challenging area for Radiation oncologist as well as Radio diagnosis specialty both due to its complex anatomy, like bone, glandular and soft tissue structures are in close proximity with each others. Imaging has important part of oral cavity cancer patients both for surgical oncologist and Radiation oncologist, Imaging provides detail information about radiotherapy planning as well as its respectability, extent of resection and reconstruction.

**Keywords:** Oral cavity cancer, Radiation oncologist, Radio diagnosis.

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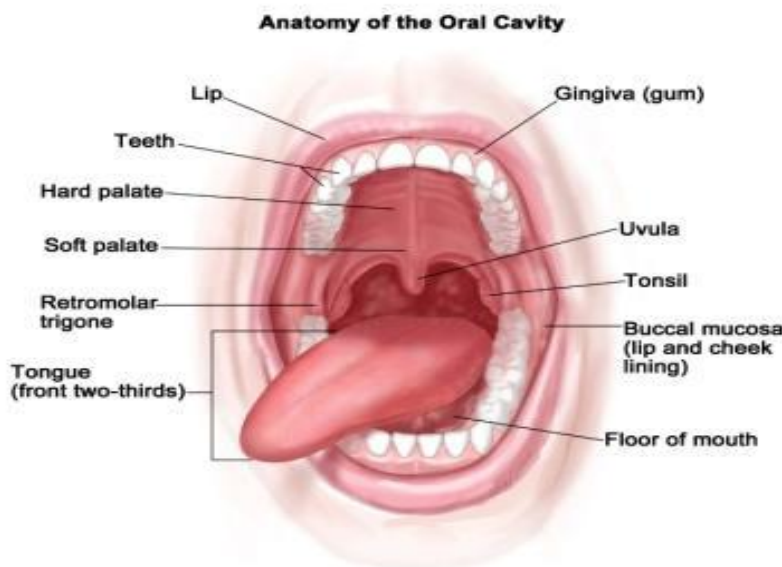
## DISCUSSION

Imaging plays a crucial role in oral cavity cancer typically squamous cell carcinoma as it provides information regarding radiotherapy planning and furthermore regarding the resettable status of this particular disease along extent and spread of disease hence it indicates about survival and prognosis of oral cavity cancer, Imaging also plays important role in differentiating post radiation changes and tumor recurrences during follow up after treatment of oral cavity cancer.

**Anatomy of Oral cavity:** Oral cavity divided into two parts

Central part (oral cavity proper): It includes tongue, hard palate forming the roof wall, upper and lower alveolus, lingual surface of gingival mucosa forming lateral wall, Mylohyoid muscle forming the floor, Anterior tonsillar pillars and soft palate forming the posterior wall of oral cavity proper, tongue basically divided into anterior part and base of tongue by circumvallate papilla.

Lateral part (vestibule) of oral cavity: It consists of buccal mucosa laterally, upper and lower gingivobuccal sulcus forming superior and inferior boundary wall respectively, lips forming anterior wall, buccal surface of gingival mucosa forming medial boundary wall and Retromolar trigone RMT forming the posterior wall.



**Figure: 1 Anatomy of Oral cavity.**

**Routes of spreads of typical oral cavity cancer:** oral cavity cancer spreads by three methods

- 1- Direct extension in mucosal / sub mucosal surface or into muscle and bone.
- 2- Spread via lymphatic drainage pathways
- 3- Spread by extension along neurovascular pathways.

**Direct extension of oral cavity cancer:** Superficial mucosal ulcer or indurations may not be seen on imaging. However imaging is needful to detect submucosal spread, direct invasion of adjacent structures and over all extent of tumors. Direct extension of oral cavity cancer to adjacent bone is seen as: 1-sub cortical erosion best seen on (CT scan) ,2- Periosteal reaction,3-Abnormal marrow attenuation or Signal intensity ( seen in MRI). However positive predictive value of CT for mandibular invasion is considered satisfactory, on other hand MRI scan has high negative predictive value. The major reason is due to inadequate sensitivity or specificity of imaging methods is failure to visualize the Alveolar crest of the mandible.

**Lymphatic spread:** Nodal involvement is the single most important prognostic indicator for oral cavity cancer, In Retro molar trigone( RMT) and floor of mouth nodal involvement goes up to 50% , for oral tongue its 40% , hard plate 10-25%, lips only 10% .

**Lateral part of oral cavity (Vestibule) Cancer:** It consists of buccal mucosa, gingivo buccal sulcus , buccal surface of gingival mucosa ,lips ,and RMT. Due to habit of tobacco chewing lower GB Complex is prevalent in Indian subcontinent that's why called as Indian oral cancer , Image reporting should include extent of primary lesion, lymph node involvement and boney involvement , Mandibular involvement in lip and buccal mucosa cancer may lead to perineural invasion along inferior alveolar nerve involvement should be seen carefully , sometimes buccal mucosa cancer that involves infratemporal fossa or pterygoplatine fossa at base of pterygoid plate may leads to the involvement of nerves along foramen ovale .

**Retro Molar Trigone (RMT):** Retro molar trigone is a triangle shape of mucosal fold which having a boundaries anterioley last molar tooth, posteriorly anterior tonsillar pillar, superiorly ramus of mandible latterly givobuccal sulcus .

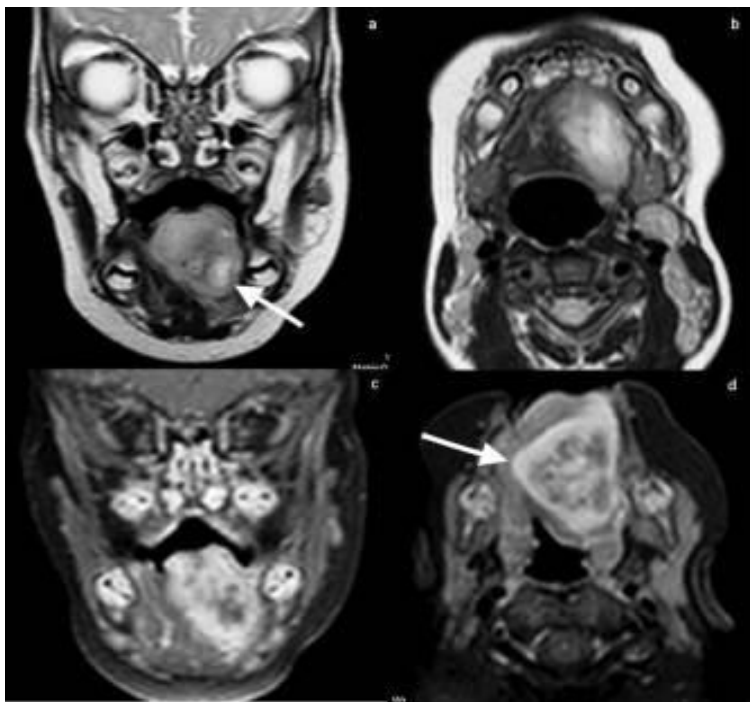
**Central Part of Oral Cavity:** It consists of oral tongue, floor of mouth FOM, and hard palate.

**Oral tongue:** Tongue carcinoma most communal arises from lateral border and few arise from ventral surface of tongue, Contrast enhanced magnetic resonance MRI is investigation of choice for tongue carcinoma . Imaging in tongue carcinoma must include reporting of given below points

- 1- Depth of invasion.
- 2- Lesion crossing mid line or not.
- 3- Floor of mouth and neurovascular bundle involvement.

- 4- Lymph node involvement.
- 5- Bone involvement.

**Floor of mouth:** It is formed by the Mylohyoid muscle seen as U shape sling on coronal image from mylohyoid ridge of one side of mandible to other side.



**Figure: 2 Tongue and Floor of mouth cancer.**

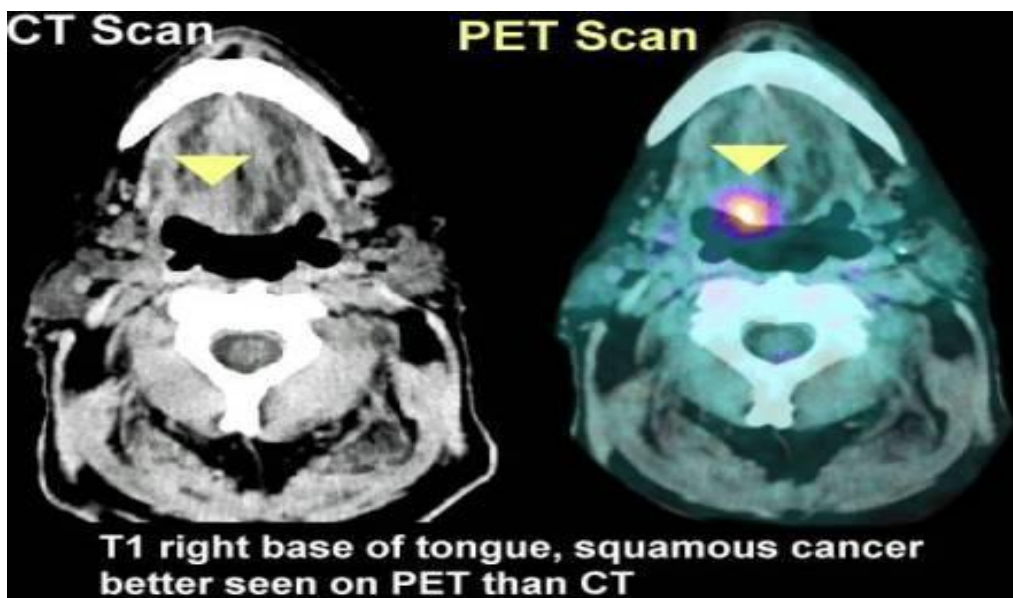
**Hard plate:** It is better visualized on coronal and sagittal images. Primary carcinoma of hard plate is rare and usually involved by extension of upper gingival sulcus.

**POST TREATMENT IMAGING IN ORAL CAVITY CANCER:** Post treatment imaging in oral cavity cancer is difficult and complicated as well because of post surgical and post radiotherapy treatment changes visualization or palpation of tumor recurrence deep to the flap reconstruction is often not possible on clinical examination. MRI is imaging of choice for evaluation of post treatment follow up in typical oral cavity cancer. Post treatment image finding can be divided into following four groups:

- 1- Altered anatomy secondary to post surgical event.
- 2- Tumor recurrence
- 3- Post surgical complications like serous retention, infection, hematoma, abscess, fistula formation.
- 4- Post Radiotherapy changes like edema, fibrosis, scarring, osteo radionecrosis .

## CONCLUSION

Imaging in oral cavity cancer helps in accurate staging , assessing respectability and planning CT Scan highly required for conformal radiotherapy in oral cavity cancer ,On CT Scan , tumor recurrence has attenuation similar to muscle hence any lesion that has lower attenuation than that of muscle is unlikely considered to be recurrence/ malignant. The perineural spread is unique form of tumor recurrence usually best pickup on MRI scan , Contrast enhanced MRI is a choice of investigation for tongue , floor of mouth, hard palate lesions as well as lesions extending up to base of skull due to high soft tissue resolution , for nodal imaging all imaging methods are considered equivalent. Positron emission tomography PET scan has a role in pre treatment assessment of locally advanced oral cavity cancer as well as in the detection recurrence of oral cavity cancer/Head and neck cancers after treatment is over.



**Figure: 3 Tongue cancer comparative imaging CT Scan versus PER Scan.**

**Conflict of interest:** None.

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