

Role of CT Imaging in Oral Cavity and Oropharyngeal Squamous Cell Carcinoma

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A B S T R A C T

Introduction: Squamous cell carcinoma (SCC) is one of the most common malignancies of the oral cavity and oropharynx. It is important to have a knowledge about anatomy of these two regions as the prognosis and behaviour of SCC depends on the regions of origin with those originating in oropharynx showing an aggressive pattern as compared to the ones originating in oral cavity. Study aimed to identify imaging features of SCC of the oral cavity and oropharynx on CT Scan and describe its TNM classification as well as implication of same in treatment planning.

Material and methods: In this study, 50 patients of age between 20-60 years with oral cavity lesions who were referred for further investigation to the department of radiodiagnosis, PDU Medical College and Civil hospital, Rajkot, Gujarat, over a period of 1 year from 01/10/2018 to 01/10/2019 are included. All scans were carried out on GE 16 SLICE CT scan machine.

Result: The most common presentation in a patient of oral cancer was non-healing mouth sore/ ulcer and the most common site of occurrence was mandibular alveolus.

Conclusion: Our study suggests that CT scan can be used as a front line imaging modality for detection of scc of oral cavity and oropharynx and is helpful for TNM staging as well as treatment planning.

Keywords: Oral SCC, Oropharyngeal SCC, SCC, TNM Staging in Oral Cancer, CT in Oral Cancer

INTRODUCTION

Oral cancer accounts for upto 4% of all cancers in the world. Its prevalence is upto 10% of all cancers in Pakistan and upto 45% in India.^{1,2} More than over 300,000 new cases were diagnosed worldwide in 2004 to 2009, out of which there were 7000 deaths.³

Squamous cell carcinoma is most common type of all oral neoplasms accounting to 90% of cases.⁴ Oral cancer is common in men in developing countries. There were 2, 74,300 new cases and 1, 45, 500 deaths worldwide in 2002, of which two-thirds took place in developing countries.⁵ Squamous cell carcinoma (SCC) is commonly evaluated with imaging modality, usually CT Scan which plays an important role in its staging. Tobacco and alcohol increases the risk of oral cancer upto fifteen times.⁶ Betel quid chewing also increases the risk of oral cancer.⁷⁻⁹ The symptoms, routes of spread and the prognosis depend on the anatomical site of origin of SCC. Therefore a radiologist must have a detailed knowledge regarding the anatomy of these two regions. The knowledge regarding anatomy and common routes of spreads is helpful for classification, staging and treatment planning. Incomplete knowledge regarding same may lead to inadequate assessment of the extent of the cancer as well as

improper staging of the same which may then lead to either unnecessary or incomplete surgical resection or improper radiation therapy which may have a negative result.

This article intends to review CT findings of oral and oropharyngeal SCC with an emphasis on imaging features that affect staging and treatment planning.

Study aimed to identify radiological imaging- CT scan findings of SCC of the oral cavity and oropharynx and to evaluate the common sites of its occurrence and to describe the TNM classification and its importance in treatment planning.

MATERIAL AND METHODS

In this Single centre study, 50 patients of age between 20-60 years with oral cavity lesions who were referred for further investigation to the department of radiodiagnosis, PDU Medical College and Civil hospital, Rajkot, Gujarat, over a period of 1 year from 01/10/2018 to 01/10/2019 were included. All scans were carried out on GE 16 SLICE CT scan machine. All patients underwent plain and contrast enhanced CT scan of head and neck region extending from skull base to thoracic inlet. CT studies were reangled to avoid dental amalgam when necessary. In patients without dental

amalgam the plane of gantry was angled parallel to hard palate. All studies were reconstructed with soft tissue and bone algorithm. None of the patients of our study had any history of previous facial/ mandibular surgery. Presence of an abnormal soft tissue mass with concomitant absence of the mandibular cortex was regarded as mandibular erosion by the mass. Out of 50 patients, 45 had undergone treatment in the form of surgical resection/ mandibulectomy at our centre and the specimens were sent to the pathologist, out of which 43 were SCC .

Inclusion criteria

- All cases of oral and oropharyngeal carcinoma.
- All age and both sexes.

Exclusion criteria:

- Patients giving negative consent.
- Patients having commenced treatment.
- Patients having any contraindication for CT Scan /for radiation exposure.

Machine Used: GE 16 SLICE CT SCANNER

RESULTS

The most common presentation was non-healing mouth sore/ ulcer to be followed by lump and difficulty in swallowing. The most common site of occurrence was mandibular alveolus (45.76%), to be followed by buccal mucosa(23.73%);

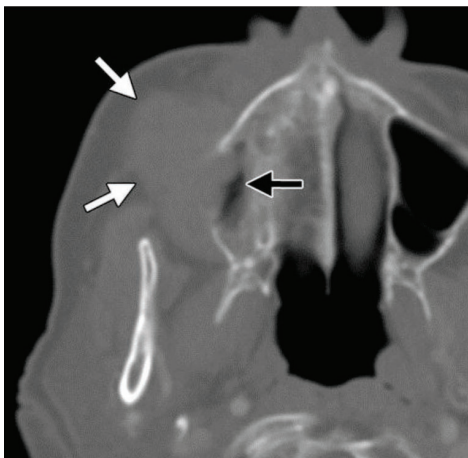


Figure-1: SCC of buccal cavity

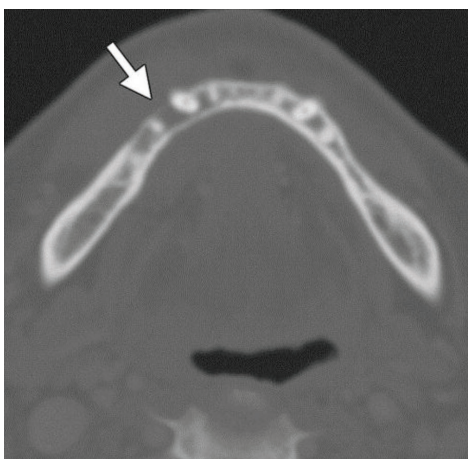


Figure-2: SCC of mandibular alveolus

tongue (18.31%), maxillary alveolus(5.76%), lips(3%), floor of mouth (2%) and palate (1.36%).

Images

Axial CECT image (bone window) which shows a buccal lesion (white arrows) which has eroded and infiltrated the right maxillary sinus (black arrow), Suggestive of a T4a lesion (fig-1).

Axial contrast-enhanced CT image (bone window) shows cortical erosion (arrow) along the right buccal aspect of the mandibular alveolus. This finding led to classification of the tumor as a T4a lesion (fig-2).

DISCUSSION

TNM Staging

Total seven stages are included- 0, I, II, III, IVA, IVB, and IVC.

Stage I or II lesions are treated with a single modality-surgical resection or radiation therapy. Stage III or IV lesions usually require a multimodality approach including surgery, radiotherapy and chemotherapy. The site of origin of tumour plays an important role in selecting the therapeutic modalities.¹⁰

Stage IV lesions are divided into three sub categories- IVA, IVB, IVC, based on different therapeutic strategies needed for each of them (the above mentioned revisions were introduced in 2002 in the sixth edition of the classification system). In 2007 the seventh edition, the definition of T4 lesion and stage IV disease was changed. Stage IVA and IVB suggest local-regional disease and stage IVC suggests distant metastasis. Stage IVA is for moderately advanced and stage IVB is for very advanced local-regional disease. Before 2007, T4a was resectable and T4b was for unresectable lesion. After changes made in 2007, in seventh edition, T4a is now moderately advanced and T4b is now referred as very advanced.

For stage IVA/IVB lesions, chemotherapy with radiotherapy for local-regional control is the preferred modality of treatment. For stage IVC palliative therapy is preferred.

The outcome of our study is similar to that of Close et al.¹¹ Our study contradicts the results of recent studies which had raised a question on the ability of CT to assess the mandibular involvement in SCC.¹¹⁻¹⁴

For CT assessment 3mm thick slice sections were used and were reconstructed with bone and soft tissue algorithms. Brown et al.¹¹ and Curran et al.¹² used 4-5mm thick slice sections without frequently using bone algorithms. Shaha¹³ and Bahadur¹⁴ have not described their technique and have not specified the criterias used for assessment on CT.

CONCLUSION

We evaluated 50 patients of oral cancer mainly the squamous cell type, using CECT imaging. Our study suggests that CECT can be used as a front line imaging modality for detection of oral and oropharyngeal cancers. As a result of the study we came to the conclusion that the most common site of occurrence of oral cancers is alveolus of mandible bone followed by the buccal mucosa and the least common site as per the study is palate. In the study we found that the patients of oral cancer mostly present with the complaint

of non-healing mouth sore or ulcer followed by lump and difficulty in swallowing.

Abbreviation

1. SCC-squamous cell carcinoma
2. CECT- contrast enhanced computed tomography
3. CT- computed tomography
4. OSCC- oral squamous cell cancer

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