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Squamous Cell Carcinoma Involving the Soft Palate - an Unapproachable Site - A Case Report

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Abstract:

The soft palate**,** also known as velum, extends posteroinferiorly, being leveled with the border between the oropharynx. The soft palate plays an important role in both swallowing and pronation. According to several publications it's difficult to rehabilitatemalignancy of soft palate. Hence, radiotherapywith Chemotherapy isthe first choice of treatment. Soft palate tumors usually present early lymph node involvement - frequently bilateral. A 58-year-old male patient was reported to Darshan Dental & Oral cancer center with complaint of growth in the oral cavity and difficulty in eating and swallowing. The growth was 4X4 cm in size, involving soft palate & right tonsil reaching upto uvula and right RMT(RetromolarTrigone). Histopathology revealed moderately diiferentiated squamous cell carcinoma. After CECT, MRI, and blood investigations, it was decided that chemoradiation will give the best result rather than surgical excision. The patient is under regular follow up.

Keywords: *Soft Palate, Oropharynx, Radiotherapy, Chemotherapy*

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1. Introduction

The term 'oral cancer' includes oral cavity cancer and oropharyngeal cancer. However, these are different clinical entities and in contemporary practice often have different etiologies and are frequently managed differently.[1]

Because of complicated anatomy of soft palate, many difficulties are encountered during and after surgery. **S**oft palate consists of the aponeurotic muscular tissue, neurovascular structures and many mucous glands that lubricate the oral cavity.

The oral surface is covered by the non-keratinized stratified squamous epithelium with secretory salivary glands. The mucosa contains a few taste buds and

features a longitudinal raphe in the midline. The oral surface also forms the roof of the oropharyngeal isthmus, an area connecting the pharynx and oral cavity. The nasal surface is lined by the simple ciliated columnar epithelium and it is continuous with the floor of the nasal cavity.

The four borders of the soft palate: anterosuperior border is attached to the hard palate via the palatine aponeurosis. Two lateral borders feature two arches; palatoglossal (anteriorly) and palatopharyngeal (posteriorly). The lateral borders of the soft palate are continuous with the tongue and the lateral wall of the pharynx. The posteroinferior border of the soft palate is free and faces towards the oropharynx. It features a conical expansion in the midline called the uvula that projects into the oral cavity.

The core of the soft palate consists of the palatine aponeurosis and 5 muscles of the soft palate. The palatine aponeurosis is an expansion of the tendon of the tensor velipalatini muscle and it comprises the anterior one-third of the soft palate. The muscles of the soft palate comprise the posterior two-thirds of its core. Namely, these muscles are the musculus uvulae, tensor veli palatini, levator veli palatini, palatopharyngeus and palatoglossus muscles.

The roof of the fauces is the oral surface of the soft palate, while the floor is the root of the tongue. The posterior, constricted part of the fauces is called the isthmus of the fauces and it is a gate between the oral cavity and oropharynx. The space between the tongue and palatoglossal and palatopharyngeal arches is called the tonsillarfossa and it is where the palatine tonsils are located.

Because of such complicated anatomy and nerve involvement, it's very difficult to surgically excise a malignant lesion of soft palate. The purpose of this publication is that to improve the knowledge about the case selection, indications, and contraindications of such lesions.

2. Case Report:

A 58-year-old male patient reported to Darshan Dental & Oral cancer center on 06/04/2021 with complaints of difficulty in eating due to a growth in posterior palatal region. Patient gave the history of smoking forthe last 20 years and diabetic since 2015. On clinical examination a multilobulated, ulcero-proliferative growth, whitish pink in color, size4 c.mX 4c.m, firm in consistency, with irregular borders wasidentified on soft palate& right tonsil reaching uptouvula and right RMT (Figure 1).

Radiographs (OPG) revealed severe bone loss involving 17,16,18,36 and 38. There was a radiolucency present in 13,14,47,48 extending up to the pulp (Figure 2). Unerupted supernumerary teeth were also present in anterior right and left maxilla.

CECT neck reported small calcified lesion measuring 5X6 mm in right lobe of thyroid. Small tonsilloliths was noted on right side, measuring 2-4 mm in size. Few sub-centimetric sized lymph nodes were notedat level II bilaterally, largest 6mm in SAD. No evidence of calcification or necrosis of lymph nodes.

MRI neck showed altered signal intensity lesion measuring 2.2(AP)X 2.1(TR)X1.1(CC) cm involving the soft palate posteriorly and extending up to right tonsillarfossa. Lesion hyperintense on T2W, Hypointense on T1W and showed heterogenous mild to enhancement on post contrast study.

Histopatholgy showed parakeratinized stratified squamous epithelium with features of epithelial dysplasia. The underlying

connective tissue showed malignant epithelial islands and sheets with keratin pearl production. Moderate amount inflammatory cell infiltrate was also noted (Figure 3). Histopathological features were suggestive of Moderately differentiated squamous cell carcinoma.

After review, the patient was referred to a higher center for chemotherapy and radiotherapy.

3. Discussion:

Cooper T et al analyzed 159 patients treated curatively between 1963 and 2016, and follow-up them for 4 years. They found 5-year local control rates were T1, 90%; T2, 90%; T3, 70%; and T4, 59%. The 5-year cause-specific survival (CSS) rate was nearly identical for patients with stage I-III disease (88%, 86%, and 88%, respectively) compared to stage IVA/B (58%). Five-year overall survival was similar between patients with stage I-III disease (50%, 57%, and 54%, respectively) and approximately doubles that of patients with stage IVA/B disease (26%). Thirteen patients (8%) had severe complications related to radiotherapy. They concluded that cure after definitive radiotherapy is relatively high in patients with stage I-III disease with soft palate carcinoma.[2]

Huang S.H, Sullivan B.O et al studied that primary radiotherapy ± chemotherapy is usually reserved for patients unable to tolerate or who are otherwise unsuited for surgery. They concluded that Brachytherapy can also be especially useful in the re-irradiation setting for persistent or recurrent disease or for a second primary arising within a previous radiation field. Biological agents targeting the epithelial growth factor receptor (EGFR) have emerged as a potential modality in combination with radiotherapy or chemoradiotherpy and are currently under evaluation in clinical trials.[1]

Squamouscell carcinoma of the soft palate and uvula is an uncommon tumor; 68 cases were seen at the University of Virginia Hospital from 1956 through March 1975, with minimum follow-up of 2 years. The incidence of metastases and second primary tumors and the contribution to survival of these together with has been analyzed. From this review it appeared that radiotherapy is an effective form of treatment for carcinomas of the soft palate and uvula.[3]
Wang B et al reported follow up data of 275 patients of oral cancer in Cancer institute and Hospital of Tianjin Medical University between 2002 and 2006 and concluded that to improve prognosis, always recommend extended local excision, flap, radical neck dissection, and adjuvant chemoradiotherapy for patients.[4]

Amar and Alberto et al did a retrospectivesyudyon 111 patients with squamous cell carcinoma of soft palate treated between 1977 and 2000 and found that radiotherapy had full response at the primary site in 76% of the patients and in the neck in 47% of N+ patients. As to recurrences, control at both sites was obtained in 52% and 31% of the cases, respectively. Cervical recurrences occurred in 11% of irradiated N0 patients and in 28% of the T1 surgical cases without neck treatment. Disease-free survival at 3 and 5 years was observed, respectively, in 45% and 35% of the patients, being significantly reduced in N+ patients.[5]

Chemotherapy used at different times in the treatment process for treatment of oral cavity or oropharyngeal cancers: Adjuvant chemotherapy **(**after surgery**),** Neoadjuvant or induction chemotherapy **(**before surgery**),** For advanced cancer**,** chemo (with or without radiation therapy). Chemoradiation is chemotherapy given at the same time as radiation. It has been shown to shrink oral

cavity and oropharyngeal tumors more than either treatment alone and is helpful for people whose cancers are not widespread, but are too advanced for surgery. But this combined approach can be hard to tolerate, especially for people in poor health. A preferred schedule is to give a dose of cisplatin every 3 weeks (for a total of 2 to 3 doses) during radiation. For people who cannot tolerate chemo, the targeted drug cetuximab might be used with radiation instead.

Klung C, Berzacy D et al conducted a retrospective Cohort study on 276 patients with disease stage III and IV, (T2: 13.0%; T3: 16.7%; T4: 70.3%; N0: 29.7%; N1: 20.3%; N2: 45.3%; N3: 4.7%; stage III: 16.3%; stage IV: 83.7%). All patients received preoperative radiochemotherapy (50Gy, Mitomycin and 5-Fluorouracil) and radical locoregional resection. They found that Median surveillance period was 101.4 months (24-202 months). 5-year overall survival probability was 53.9%. 5-year local control probability was 70.2%. They concluded that reliability of pre-operative treatment of patients with oral and oropharyngeal cancer.[6]

Shinoda M, Hatooka S had concluded after some clinical trials that definitive chemoradiation can achieve results comparable to surgery with neoadjuvant chemoradiation in locoregional esophageal cancer.[7]

Kurita H, Koika T et al conducted a retrospective study on 41 patients with advanced SCC (stage III and IV) was completely surgically removed. The level of neck node metastasis ($p<0.02$) was a significant independent predictor for cause-specific survival and adjuvant chemotherapy was of borderline significance ($p=0.07$). The number of neck node metastasis ($p<0.01$) and adjuvant chemotherapy ($p<0.01$) were significantly related with disease free survival. They suggested that adjuvant chemotherapy had a significant benefit in improving disease free survival.[8]

Vermorken J B et al discussed about the current concept of chemotherapy for the management of head and neck cancer and found that chemotherapy can be administered in patients with locoregionally advanced (LA) squamous cell carcinoma of the head and neck (SCCHN) either concurrently with irradiation or as induction chemotherapy prior to local treatment or as palliative therapy in patients with recurrent and/or metastatic disease. Cisplatin-based chemoradiation is still the standard for LA-SCCHN. TPF has emerged as the new standard regimen when induction chemotherapy is indicated. Areas of active investigation in LA-SCCHN are the sequential administration of induction chemotherapy followed by chemoradiation and the integration of targeted therapies. None of the combination chemotherapy regimens demonstrated an overall survival benefit when compared to single agent methotrexate, cisplatin or 5-fluorouracil in recurrent/metastatic disease. Combination chemotherapy in this setting is preferably used in younger patients with a good performance status and with symptomatic disease who require prompt symptom relief. However, a survival benefit was observed when cetuximab was combined with platinum-5-fluorouracil.[9]

Smoking during chemotherapy treatment can cause more side effects and can cause the chemo drugs to not work as well. It can give you a higher chance of getting an infection and is linked to worse outcomes. Smoking after treatment can also increase the risk of the cancer coming back and of getting another new cancer. Quitting

smoking (before treatment starts) is the best way to improve chances of survival**.**

The chemo drugs like Cisplatin, carboplatin, %-fluorouracil (5-FU), Paclitaxel (Taxol), Docetaxel (Taxotere), Hydroxyurea are used most often for cancers of the oral cavity and oropharynx that can be given with or without radiation include. Other drugs like Methotrexate, Capecitabine arealso used. [7]

Surgical resection of cancers in the oral cavity impacts on the two most important functions of the organs involved: speech and swallowing. More specifically, the oral preparatory phase (formation of a bolus) and the oral phase of normal deglutition, can be significantly impaired following tumor ablation. Several cranial nerves like spinal accessory nerve, phrenic nerve, recurrent laryngeal nerve, superior laryngeal nerve, and sympathetic trunk are at risk during resection of primary tumours as well as neck dissection for removal of "at risk" or involved lymph nodes.[9-10]

Injury to Spinal accessory nerve can cause Shoulder syndrome, pain, muscle weakness, shoulder movement restraint. Phrenic nerve injury is responsible for 70% of the respiratory movement and long-term pulmonary complications. [10]

Recurrent laryngeal nerve injury causes unilateral true vocal cord paralysis. Injury to the branches of the superior laryngeal nerve can cause minor swallowing difficulties due to decreased sensation at the laryngeal inlet, or decreased tensor capability of the true vocal cord. Early fatigability and decreased ability to phonate high pitched sound.[10]

Disruption of the sympathetic trunk nerve fibers may cause ipsilateral Horner's syndrome. Horner's syndrome involves blepharoptosis due to disruption of the innervation to Mueller's muscle, miosis or pupillary constriction, anhidrosis with lack of perspiration of the forehead skin, apparent enophthalmos, and vascular dilation ipsilateral to the injury.[10-13]

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Figures with Legends:

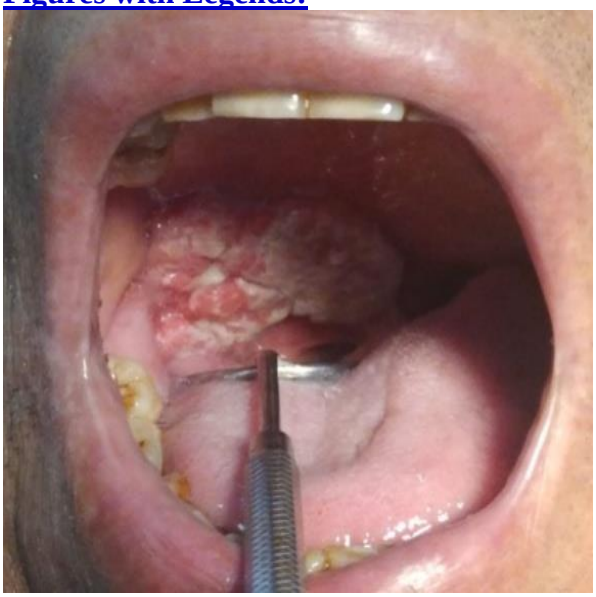

Figure 1: showing the clinical picture of the lesion involving the soft palate

Figure 2: showing OPG with multiple periapical pathology and unerupted teeth

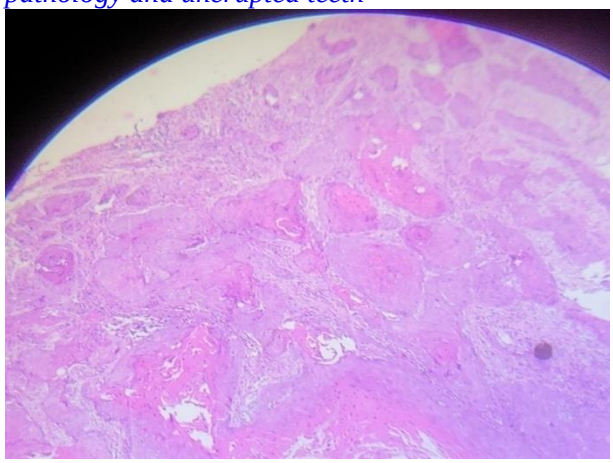

Figure-3 showing multiple malignant epithelial islands invading the connective tissue. (H&E - 20x)