# Role of Maxillo-Facial Prosthodontist to Aid in Brachytherapy for Squamous Cell Carcinoma of Palate with Ancillary Prosthesis: A Case Report

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**Abstract**

Squamous cell carcinoma being the most prevalent malignant neoplasm and of all oral cancers more than 90% are squamous cell carcinoma. The treatment of OSCC generally requires the services of a multidisciplinary team with main aim to eradicate the cancer. Surgery is the preferred first line treatment of small, accessible OSCCs. Advanced-stage OSCC is usually treated by a combined treatment program of surgery, chemotherapy, and radiotherapy. Brachytherapy being most common form of radiotherapy used for treating OSCC. To place radiation delivering unit (catheter) to appropriate place on the tumor site we prosthodontist help in aiding brachytherapy with help of ancillary prosthesis especially in intraoral scenarios. Ancillary literally means: providing necessary support to the primary activities or operation of an organization, system, etc. Present case was diagnosed with squamous cell carcinoma of the mid palatal region and was referred to Faculty of dental sciences by Department of Radiology Ramaiah medical hospital for a device for holding the catheters in position to aid in brachytherapy procedure**.**

**Keywords**: *Squamous Cell Carcinoma, Brachytherapy, Ancillary Prosthesis, Multidisciplinary Team*

## 1. INTRODUCTION

The most prevalent malignant neoplasm of the oral cavity is Squamous cell carcinoma. In developing countries, after lung, prostrate, colorectal, stomach and bladder cancer, carcinoma of oral cavity in males is the sixth most common cancer. It is the tenth most common site of cancer after breast, colorectal, lung, stomach, uterus, cervix, ovary, bladder and liver in females. The risk factors for SCC are tobacco, betel quid, alcohol and recently human papilloma virus infection[1]. Of all oral cancers more than 90% are squamous cell carcinoma [2].

The treatment of OSCC generally requires the services of a multidisciplinary team, the main aim of treatment is to eradicate the cancer, to prevent recurrence and finally restore the form and function of the affected parts. Surgery is the preferred first line treatment of small, accessible OSCCs. However, advanced-stage OSCC is usually treated by a combined treatment program of surgery, chemotherapy, and radiotherapy. Radiotherapy can be in the form of 1ExternalBeamRadiation
2Brachytherapy[3]

Usually, for delivering the radiation to the localized tumor site, the needles or the catheters need to be placed exact in the tumor site, such precision requires aid for catheters to be placed in position. we prosthodontist can help in aiding brachytherapy with help of ancillary prosthesis especially in intraoral scenarios, that would help the radiation delivering unit catheter to be placed appropriately on the tumor site 4 Where ancillary literally means: providing necessary support to

the primary activities or operation of an organization, system, etc.

## 2. CLINICAL REPORT

A male patient aged 57, was referred to Faculty of dental sciences by Department of Radiology Ramaiah medical hospital. Patient was diagnosed with squamous cell carcinoma of the mid palatal region Fig. 1. With respect to aiding brachytherapy procedure patient was referred for a device for holding the catheters in position. Patient was referred to the Dental wing for team work in the management of a midline lesion measuring 2.3×2.3 cm and extending from hard palate to the border of soft palate without involving the alveolar bone Fig. 2. As alveolar bone was not involved extraction of remaining teeth was not indicated and preferred to go ahead with the brachytherapy first, later oral rehabilitation. Patient had full range of motion in the head and neck and was without extraoral swelling. On intraoral examination, normal interincisal opening of approximately 39 mm without restriction of tongue movements was present. Oral hygiene condition was poor with multiple missing teeth and generalized gingival recession Fig. 3.

**Fig. 1 Ancillary prosthesis with brachytherapy catheters**

Radiologist suggested brachytherapy approach for delivery of radiation treatment, and to fabricate the brachytherapy delivery prosthesis Dental Service was requested. External beam radiation could be an alternative treatment option for this malignancy. As it includes a much larger field of exposure and can aggravate postradiotherapy sequelae of xerostomia, mucositis, dysphagia, and dysgeusia radiologist selected brachytherapy approach.

**Fig. 2 Frontal and lateral view**

**Fig. 3 Intra oral view of SCC**

## 3. STEPS INCLUDED IN CLINICAL AND LABORATORY

### Procedures

1) Primary impression made with alginate impression material Fig. 4 recording the tumor extent and poured with dental stone. Fig. 5

2) Adaptation of 2 mm wax spacer on the palate space for soft liner overlaid with strips of wax spacer of 2mm width and 2mm thickness was placed 1cm apart this is to make slot for the catheter in the prosthesis.
NOTE: Catheter was quiet sensitive to the heat and pressure, therefore to avoid the heat from the curing of cold cure resin, slots were prepared

3) Self-cure transparent acrylic resin placed with two c-clasp 0.7mm stainless steel round wire on maxillary right 2nd

premolar and maxillary left 1st premolar and allowed to polymerize Fig. 6.

4) Ancillary prosthesis finished and polished.

5) Wax spacer removed to ensure prosthesis with slots 1cm apart is clearly visible Fig. 7.

6) Adaptation and Catheter stabilization in anterior region with carding wax Fig. 8

7) Soft liner loaded and placed into patient mouth in the remaining area.

8) Then carding wax removed and replaced with soft liner

9) Final prosthesis with 4 catheters was used to provide brachytherapy to the patient

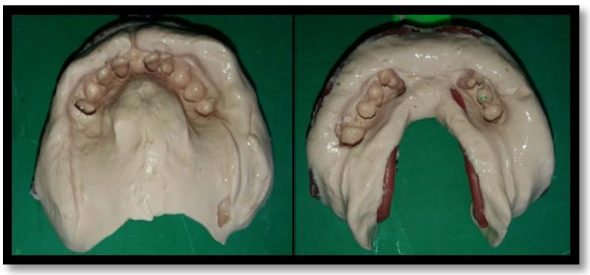

**Fig. 4 Alginate impression**

**Fig. 5 Cast with prosthesis**

**Fig. 6 Prosthesis without spacer**

**Fig. 7 1 cm apart slots for catheter**

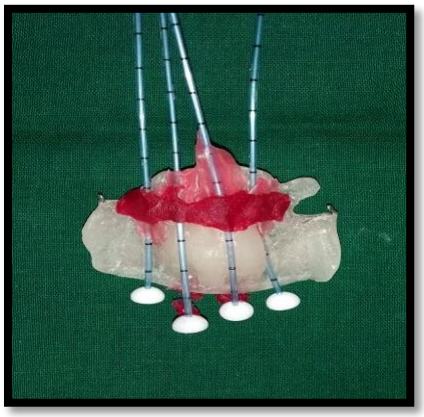

**Fig. 8 Catheter adaptation and stabilization with carding wax**


**Fig. 10 Patient receiving brachytherapy using ancillary prosthesis**

## 4. DISCUSSION

Presents case is an example of an intraoral squamous cell carcinoma. As it was involving a limited area on palate so brachytherapy was the choice of treatment. Primary advantage of brachytherapy is that it is a personalized treatment delivery system that permits highly specific radiotherapy exposure, thereby reducing the postradiotherapy sequelae of xerostomia, mucositis, dysphagia, and dysgeusia. As it is a limited duration treatment, which makes it an important consideration for quality of life in patients with limited life expectancy. While administering brachytherapy, the absorbed dose of radioisotope is also reduced to surrounding tissues, reducing the morbidity of surgery, preserving the function of major salivary glands, being an outpatient treatment procedure. Follow-up period is relatively short and allowing simple repeated non-invasive treatments are the advantages of brachytherapy[5]. The main disadvantages to this technique are

1) Brachytherapy may not be ideal for larger tumour volumes

2) It requires the fabrication of a delivery prosthesis to plan and adequately deliver the desired treatment dose.

Brachytherapy is an advanced cancer treatment. Radioactive seeds or sources are placed in or near the tumor itself, giving a better radiation dose to the tumor while reducing the radiation exposure in the surrounding healthy tissues making it localized, precise, and high-tech. The term "brachy" is Greek for short distance. In Brachytherapy, the dose is primarily dependent upon the distance from the site of interest. Brachytherapy uses short range radioisotopes adjacent to or directly within the site of interest but In contrast to external beam radiotherapy in which photons originate almost a meter away from the site of interest. The inverse square law states that intensity of radiation is inversely proportional to the square of the distance of the source. As position of the radioisotope will determine the dose to the site of interest and surrounding tissues making inverse square law important in brachytherapy[6].

Ancillary prostheses: one of the three main categories of dental prostheses made by those in the field of prosthodontics. It's a prosthesis not able to be described as either a dental prosthesis or a maxillofacial prosthesis. Examples may include guides, stents, splints, conformers, carriers and the like. Most such prostheses are intended for short term or special usage[7].

Ancillary prosthetic treatment is indicated when anatomical parts of the head and neck are not replaceable by living tissue, when recurrence of malignancy is likely, when radiotherapy is being administered, or when fragments of facial bones are severely displaced in a fracture. A temporary prosthesis may cover a defect when plastic surgery repair requires many steps, and speech appliances may be used when surgery is considered no advantageous for the closure of a cleft palate[8].

## 5. SUMMARY

Multidisciplinary approach is the key to success to all intra oral and extra-oral cancer treatment. A multidisciplinary approach is required during the rehabilitation procedure to bring out effective results, discussing each individual case, considering all variables, and choosing the best option for each patient. Ancillary maxillofacial prostheses limit the patient's disability and improve function. These prostheses are inevitable

in restoring the general and psychological health of the patient squamous cell carcinoma of the oral cavity are malignancies that require combined treatment. The brachytherapy prosthesis designed and fabricated after the dental team evaluated the patient and consulted with the radiation oncology team. The use of a brachytherapy prosthesis is suitable for the management of an intraoral malignancy with least patient morbidity.

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