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Full Mouth Rehabilitation of a Patient with Radiation Caries: Case Report

Abstract

Radiation therapy is a very important treatment modality in the management of the neck region. Nevertheless it is associated with undesired reactions. Irradiated patients are at increased risk of developing rapid caries since it damages the salivary glands and causes xerostomia. Trismus is also a common side effect after radiotherapy. Hence patients with radiotherapy induced xerostomia face challenges in prosthodontics management. This clinical report discusses the treatment planning and restoration of a 28 year old male patient who had undergone radiation therapy for carcinoma of the pharynx. He presented with a chief complaint of difficulty in chewing and limited mouth opening. Full mouth rehabilitation was done with PFM and metal crowns after endodontic treatment.

Key Words

Radiation caries; xerostomia; full mouth rehabilitation

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INTRODUCTION

Radiation therapy is a very important treatment modality in the management of neoplasm of neck region. In some tumors it's the preferred treatment whereas in others it is employed in combination with surgery or sometimes with chemotherapy. Post radiation sequelae are significant and well known and may result in needless morbidity. Radiation therapy is a cancer treatment that uses high-energy x-rays or other types of radiation to kill cancer cells. There are two types of radiation therapy. External radiation therapy uses a machine outside the body to send radiation toward the cancer. Internal radiation therapy uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer. The way the radiation therapy is given depends on the type and stage of the cancer being treated.[1] Irradiated patients are at increased risk of developing rapid caries since it damages the salivary glands and causes xerostomia[2].Trismus is also a common side effect after radiotherapy. This article discusses a detailed report of a patient suffering from radiation caries, its management and post treatment maintenance.

CASE REPORT

A 28 year old male patient reported to a dental college with a chief complaint of difficulty in chewing and opening his mouth. His medical history revealed of having undergone treatment for carcinoma of pharynx. Patient had undergone a local tumour resection followed by radiotherapy. On examination, 11 was missing. It was extracted prior to radiation therapy due to poor prognosis.21 had an Elle's class 2 fracture. 33 and 43 were congenitally missing. 18 28 38 48 were unerupted. Most of the remaining teeth had occlusal and cervical caries due to irradiation (Fig. 1). The patient also had a bite collapse (Fig. 2 & Fig. 3). Patient was diagnosed of having radiation caries. The saliva was mucous and thick. Mild gingivitis was seen. There was bleeding on probing. Diagnostic impressions were made and were mounted on a semi adjustable articulator using a face bow. A 2mm collapse in the bite was seen. The freeway space was increased to 5 mm which indicated that there was space for restoration. Hence it was decided to restore the lost vertical dimension. Diagnostic wax up was done and approved by the patient. Maxillary and mandibular teeth were altered to optimum esthetics. The patient was presented with different treatment options. Due to economic constraints patient was suggested full metal crowns in the posteriors and ceramic facing crowns in the anteriors. Putty index was obtained from the diagnostic wax up and same was used to fabricate provisional crowns. Endodontic treatment of all his

Fig. 1: Preoperative occlusal view of maxillary arch showing the radiation affected teeth

Fig. 2: Preoperative buccal view of left side showing bite collapse

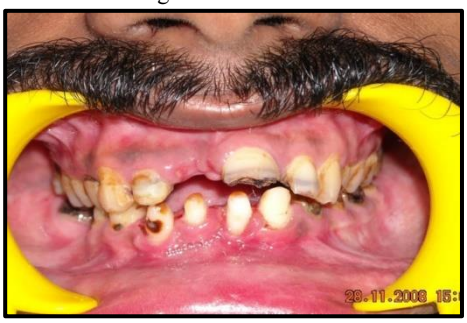

Fig. 3: Preoperative front view showing the missing teeth and caries affected teeth

Fig. 4: Anterior PFM restorations after cementation

Fig. 5: Postoperative maxillary occlusal view after cementation of permanent crowns

Fig. 6: Postoperative view after cementation of maxillary and mandibular crowns

Fig. 7: Patient satisfied with aesthetics and function

teeth was carried out. Post was given on 21 followed by a composite core build up. Tooth preparation of anterior and posterior teeth was done on successive days. The posterior bite was increased by 2mm. Acrylic crowns were cemented using zinc oxide eugenol cement. The patient was given 8 weeks time to adjust to his new bite. Provisional restorations were modified till the patient was satisfied with phonetics, esthetics and function. Final impressions were made using polyvinyl siloxane impression materials. The permanent crowns and FPD were fabricated and anterior Crowns and FPD were cemented first (Fig. 4). Protrusive contacts and canine guidance were established in the anterior restorations. Obtaining this guidance, the posterior wax patterns were fabricated and subsequently casted. The posterior crowns were then cemented with Glass ionomer cement (Fig. 5). The patient was satisfied with the esthetics and function of his teeth (Fig. 6 & Fig. 7).

Post Treatment maintenance: Following treatment, the patient was encouraged to have regular dental examinations once in six months. He was instructed to floss each tooth regularly and brush his teeth twice daily without fail. Scaling and polishing was advised every 6 months to prevent plaque accumulation. Patient was prescribed chlorhexidine

1.2% mouth rinse once daily.[3] He was asked to apply fluoride gel for five minutes on a daily basis. Since the patient was suffering from xerostomia, He was also advised to avoid alcohol intake. Artificial salivary substitutes were also prescribed. Lastly the patient was asked to maintain a good diet and avoid high sugar content foods.

Discussion

Carcinoma in the head and neck region followed by surgery and radiotherapy has a dramatic effect on the quality of life of the patient. The dentist plays an important role in improving the quality of life of irradiated patients. Most of the patients require full mouth rehabilitation due to radiation caries involving most of the teeth. A combination of surgery and radiation is the most commonly used protocol for patients with pharyngeal cancer. Xerostomia is the most common sequelae of irradiation. Post radiation glandular atrophy is partly due to a reduction in the vascularity of the gland and partly to the direct effect of x rays on the highly specialized and sensitive secretary epithelial cells.[4] The carious lesions tend to develop four weeks after completion of radiotherapy and affect atypical areas of teeth, such as the lingual surface, incisal edges and cusp tips. The most common pattern (Type 1) affects the cervical aspect of the teeth and extends along the cementoenamel junction. A circumferential injury develops and crown amputation often occurs.[5] The second pattern (Type 2) presents with areas of demineralization on all dental surfaces. Generalized erosions and worn occlusal and incisal surfaces are not uncommon

The third and least common pattern (Type 3) presents as color changes in the dentin. The crown becomes dark brown/black and occlusal and incisal wear may be seen.[5] After radiation therapy, the dentist should rule out infections in the oral cavity due to the compromised host defence mechanism.[6] A detailed clinical examination should be done Different prosthetic treatment options should be made available to the patient.Once the treatment is completed maintenance of the same is very important. Based on their ten year experience with 935 patients, Horiot et al. claimed a five minute daily application of fluoride gel is the most reliable method for the prevention of post-irradiation dental caries.[7] Meyerowitz *et al*., showed rinsing daily with a 0.05% NaF mouthrinse prevented demineralization and increased enamel remineralization in irradiated patients.[8] It has been shown sugarfree gums may stimulate salivary flow, buffering, and sugar clearance. Further, adding xylitol to chewing gum could enhance its caries-preventing effects.[9] Spak *et al*., compared the application of NaF gel 0.42% and 1.23% in individual trays and found the use of the former is sufficient to inhibit caries formation.[10]

CONCLUSION

Hence apart from the oncologist and the radiation team the dentist also plays a very important role in the diagnosis and treatment planning of radiation patients.

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