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Management of a hemimandibulectomy patient using a guide plane prosthesis and a cast partial denture: A case report

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Abstract

The restoration of normal function and esthetics is often challenging in the prosthetic rehabilitation of patients with hemimandibulectomy defects due to unstable occlusion and mandibular deviation. The extensive period of time for completion of healing of the reconstructed mandible through reconstructive plastic surgery and/or implant-assisted prosthesis may compromise the masticatory function by causing delay in the fabrication of definitive prosthesis [1]. This case report highlights different treatment modalities in the rehabilitation of a patient who underwent a hemimandibulectomy due to an aggressive squamous cell carcinoma of the lower left jaw and involving some aspects of the neck.

Keywords: Hemimandibulectomy, guide plane prosthesis, cast partial denture

Introduction

Maxillofacial Prosthetics is a branch of dentistry that deals with acquired defects of the Head and Neck. Maxillofacial Prosthetics integrates parts of multiple disciplines including head and neck oncology, plastic surgery, speech, and other related disciplines. Treatment of maxillofacial defects has evolved to a multidisciplinary treatment modality and consists of a combination of invasive and non-invasive approaches. Surgery can result in cosmetic, functional and psychological impairment greatly affecting the patient's quality of life. Defects of the Head and Neck can greatly disrupt the quality of life of such patients incapacitating them to carry out regular daily functions such as mastication, deglutition, speech and socialisation Presently the thrust in cancer care is not simply on survival but on rehabilitation, which aims to improve multiple impairments and quality of life. Health related quality of life refers to a multidimensional concept, which encompasses perception of both negative and positive aspects of at least four dimensions of physical, emotional, social and cognitive functions [2]. Rehabilitation goals are focused on the restorative, supportive, palliative and preventive aspects of treatment. Advanced cancers or trauma destroying structures, which may include soft and hard tissues of jaws, facial skeleton, oral tissues, lips, cheeks, nose and eyes, can affect the maxillofacial region. The primary objective of rehabilitation is to preserve and restore the function of speech and swallow. This precludes the image restoration and in turn boosts the confidence of the patients hence enabling them to return to society after having suffered the ravages of disfigurement [3].

Case Report

A 29 year old male patient reported to the Department of Prosthodontics at the D.Y. Patil School of Dentistry. He presented with a chief complaint of missing teeth which caused him inability to eat and speak properly. The patient was screened according to protocol for his general health in order to come arrive at a diagnosis. He was also bothered by his appearance and hence, desired treatment of the same. On intraoral examination, it was noted that the patient presented with a large defect that extended from the mandibular region involving the entire left jaw. History revealed that the patient underwent a Hemimandibulectomy surgery for a Squamous Cell Carcinoma (T1N1M0). The patient also showed deviation of the mandible towards the surgical side along with missing lower anteriors and all the teeth in the third quadrant.

At the first clinical appointment, a case history and preoperative photographs of the patient were taken (Fig 1).



Fig 1: Extraoral frontal view of the patient

partial denture would be fabricated. With the aid of the same models a guide plane prosthesis with an acrylic ramp was fabricated chairside while guiding the patient into his centric occlusion in order to correct his deviation (Fig 4)



Fig 4: Fabrication of a Guide plane prosthesis with an acrylic ramp.



Fig 2: Intraoral view of the Defect



Fig 5: Correction of deviation with the help of the guide plane prosthesis.

The patient was called for regular follow-up appointments every two weeks to assess the correction of his deviation and after 8 weeks, satisfactory occlusion was established. A definitive treatment was initiated. Custom trays were fabricated for the final impression which were made in Monophase impression material. A master cast was poured using Die Stone and these models were surveyed to fabricate a metal framework for a cast partial denture. After establishing a favourable path of insertion, guide planes and a prosthesis design, a wax pattern of the same was fabricated. A metal trial was done in the patient's mouth to check for its passive fit and to check for any metal interferences (Fig 5).



Fig 3: Post operative OPG of the patient

Diagnostic impressions were made using irreversible hydrocolloid with prefabricated stock metal trays. Models were poured in Type 2 Dental Stone and using these models and radiographs, a treatment plan was formulated. On the same models a primary surveying procedure was carried out to ultimately decide a final treatment plan. It was decided to first correct the deviation of the patients mandible with the aid of a guide plane prosthesis following which a definitive cast



Fig 5: Metal trial of cast partial denture

A jaw relation was then taken which was followed up with a denture trial using Ivoclar denture teeth. After consenting

with the patient, the trial denture was sent for final acrylisation. The patient was educated about insertion and removal of the denture along with post insertion and home

care instructions. At the follow up visit after 7 days, the patient seemed satisfied with the prosthesis and was able to place and remove it easily (Fig 6/Fig 7)

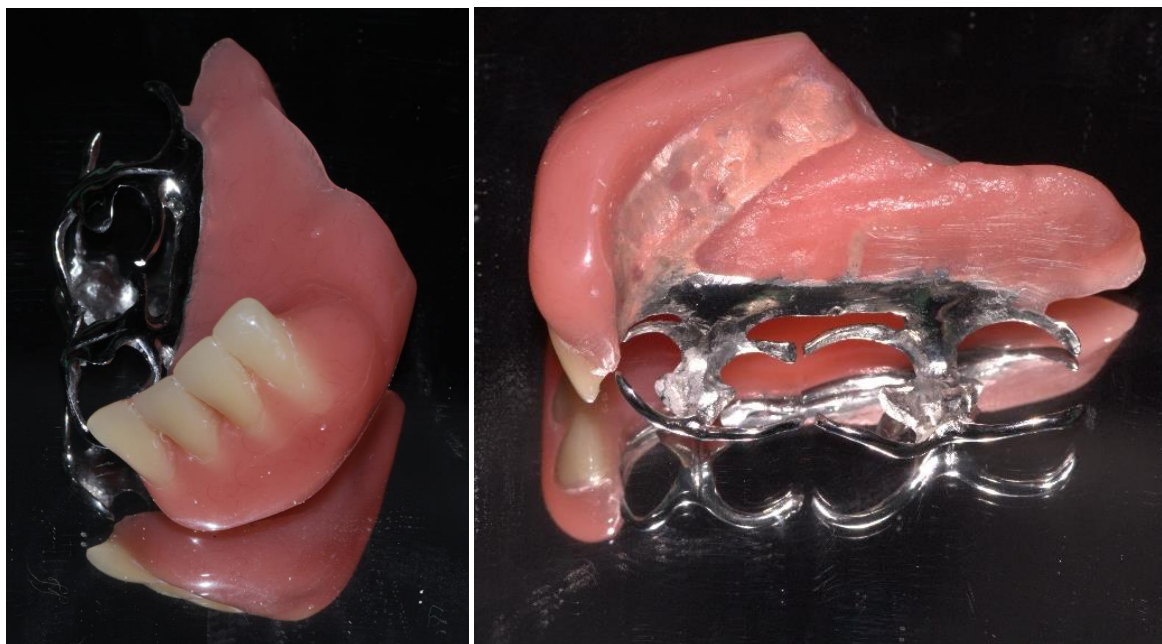


Fig 6-7: Final acrylized cast partial denture



Fig 8-9: Extraoral and intraoral postoperative frontal view of the patient

Due to the large anterior defect which was present, the patient was also informed that he would require periodic re-lining of the denture every 6 months to aid in its stability. At the subsequent recall appointments, minor occlusal adjustments were made. Apart from that, the prosthesis has been functioning well, has an acceptable fit and has helped to improve the esthetics and boost the confidence of the patient.

Discussion

Squamous cell carcinoma of the oral cavity is the most common malignancy and well known for its high rate of morbidity and mortality world over. Its reported incidents rate in India is on the rise owing to socio-economic conditions, tobacco abuse and alcohol consumption. The statistical analysis by the international agency for research on cancer (IARC) indicated that the lip and mandible of the oral cavity is the 10th most common tumour site in humans. Annually, more than 6,40,000 patients worldwide are diagnosed with the

primary cancer in this area, and approximately 3,50,000 die of this disease [4]. The main objective of rehabilitating the patient was to help in alleviating various distressing symptoms such as compromised speech, swallowing, and masticatory functions.

Conclusion

Head and neck cancer and its treatment can have a profound effect on the patient's physical, functional and emotional well-being, especially decreasing the quality of life [5]. Progress in the treatment of oral cancer has made it possible to reduce the post treatment mortality, and in turn increase the survival rate of patients. The tumour treatment of head and neck cancer patients causes the quality of life of these patients to deteriorate considerably after treatment, owing to the impairment of important functions such as eating, swallowing and speech on one hand and esthetic aspects related to socialisation on the other. Maxillofacial rehabilitation, and

hence prosthodontist occupy a special role in the achievement of a complex somatic, psychic, and social improvement of the patient. A key role should be played throughout this process

by the maxillofacial prosthodontist who can establish early contact with the patient prior to surgery and be actively involved in the entire treatment process.



Fig 10.

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