

CASE REPORT**Cast removable partial denture improving appearance and masticatory function - A case report.*** Md. Ali Afzal Khan¹, Aleya Begum², Md. Nazmul Hasan³, Newaz Mohsina⁴, Md. Mamunur Rahman Jahangir⁵ □

1. Assistant Professor, Department of Prosthodontics, Update Dental College & Hospital.
2. Associate Professor And Head, Department of Prosthodontics, Update Dental College & Hospital.
3. Assistant Professor And Head, Department of Orthodontics And Dentofacial Orthopedics, Update Dental College & Hospital.
4. Department of Oral And Maxillofacial Surgery, Dhaka Dental College & Hospital.
5. Senior Lecturer, Department of Science of Dental Materials, Update Dental College & Hospital.

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ABSTRACT

Dentists are disappointed after delivery of cast removable partial dentures because their patient refuses or is unable to wear the denture and the treatment is therefore deemed unsuccessful. When so many patients do not comply with treatment, it is instructive to reflect on why and how the treatment is performed. Appropriate, comprehensive treatment planning should precede and eliciting the patient's chief complaint, as well as his or her expectations of treatment before treatment planning. The case presentation provides for the practitioner to discuss the patient's expectations and to outline both favourable and unfavourable short and long term outcomes. By providing this information, the practitioner ensures that the patient is fully informed before giving consent and that he or she understands the associated benefits and risks.

Introduction

Removable partial denture is utilized to improve the aesthetic and masticatory function. It fulfils the necessary requirement of patient. Masticatory performance and bite force as the objective measurement in evaluating masticatory function. Denture patient were reported handicapped and have less masticatory performance¹⁻¹⁰. The demand for replacement of missing teeth is strongly related to the position of the missing teeth. Replacement of missing posterior teeth and cosmetic dental treatment in general, depends on the perception

of the patient. Even in countries with highly developed dental care systems, open spaces in the premolar and molar regions are well accepted by people of all ages.¹² However where anterior teeth are missing, the importance of restoring the spaces is self evident and reinforced by the large impact on satisfaction with esthetics where there are any unrestored spaces.¹³ Even when the patient considers the prosthesis unsatisfactory, he or she is more likely to wear the device if it replaces missing anterior teeth.¹⁴

**Address of Correspondence:*

Dr. Ali Afzal Khan
Asst. Professor
Dept of Prosthodontics
Update Dental College & Hospital.
Aichi Nagor, JBCS Sarani, Turag, Dhaka-1711.
Telephone: +8801912-331254
E-mail: dr.afzal14@yahoo.com

The prospect of a good esthetic result frequently motivates the patient to wear a new denture¹⁵ and esthetics can be more important than function for many individuals.^{11,16}

A desire to enhance chewing ability is the second most frequent reason given for seeking dental treatment.¹⁷ Masticatory efficiency of the dentition can be determined by an objective and repeatable laboratory test¹⁸ that measures the amount of grinding for a predetermined number of strokes. Masticatory ability is the subjective assessment of chewing capacity, as determined by questionnaire or interview.¹⁹ The act of mastication is one of the most important physiological determinants governing food intake. If people feel they can chew efficiently, then their food intake is not restricted by texture or hardness. An intact masticatory apparatus can exert a positive effect on nutrition by permitting a wide selection of food items, whereas compromised dentition can have a detrimental effect by promoting adverse shifts in food ingestion patterns.²⁰

Case Report

A male patient aged 56 years reported to the department of Prosthodontics, Bangabandhu shekh mujib medical university, Dhaka, for the treatment of his missing teeth for four month. The patient was mixed diet consumer and demanded a restoration which improves the appearance and masticatory efficiency. On clinical examination and analysis of the mounted diagnostic models, the patient exhibit with missing both central incisors, lateral incisors, canines, right first premolars, right first and second molars and left second molar. The intra oral picture and mounted diagnosed casts showed maximum space between the edentulous space and the opposing remaining natural teeth. Diagnostic models were analyzed and were surveyed.



Fig 1. Pre treatment photograph.



Fig 2. Alignment of the metallic removable partial denture.



Fig 3. Intra Oral view of Insertion of the prostheses.



Fig 4. Insertion of the prostheses after curing.

Mockup mouth preparations were done on the diagnostic models and the desired preparations were executed on the teeth intraorally in the patient's mouth. Final mouth preparations were made in the patients mouth and final impressions were made using polyether elastomeric impression material. Master cast fabricated using high strength stone. Master cast surveying procedure was carried out to block the under cuts and refractory casts were made using phosphate bonded investment material. Wax pattern were contoured using preformed wax patterns. All the surface were contoured in the anatomical form.

The refractory model with the wax pattern was invested and casting procedure was carried out. The casted cast partial denture was finished and polished in the conventional manner. The metal framework was tried in the patients' mouth for proper seating. The occlusal rim was made and proper alignment was done and tried again. After curing the satisfactory consent was obtained from the patient and the cast partial denture was delivered to the patient. One year follow-up, the patient had provided evidence of better face profile and he reported superior masticatory efficiency.

Discussion

The procedure explained in the rehabilitation of this patient is an innovative way of restoration of partially edentulous arches with increased masticatory efficiency and appearance. The cast partial denture fabrication metal framework will be trained in the patient's mouth and will be subjected to acrylization. The impact strength, compressive strength of the alloys with acrylic

resins are better than the non metallic acrylic denture. Krall and others were investigate to state that the presence of removable partial denture is an important for nutritional intake and the replacement of missing teeth could help people maintain a healthy diet. Other investigators have reported that partial tooth loss results in altered food acceptability, just as edentulism is associated with poor diet and compromised nutrition and tooth loss may cause dietary change.²¹ Moynihan and others suggested that the probable reason for failure of prosthetic rehabilitation to improve diet is that chewing ability is only one component of food choice. In the absence of dietary intervention, patients may be unaware of the need to change their diet, and those requiring dental prostheses should therefore receive dietary advice that accounts for all the factors influencing individual food choice.²²

Conclusion

The restoration of the partially edentulous exhibits a challenging decision making in planning the treatment without compromising the patient's needs. The technique followed in the treatment of this patient is a simple but yet effective treatment plan for providing an optimum treatment for an individual.

References

1. Helkimo E, Carisson GE, Helkimo M. Chewing efficiency and state of dentition. A methodologic study. *Acta Odontol Scand* 1978; 36:33-41.
2. Mahmood WA, Watson CJ, Ogden AR, Hawkins RV. Use of image analysis in determining masticatory efficiency in patients presenting for immediate dentures. *Int J Prosthodont* 1992; 5:359-66.
3. Manly RS, Vinton P. A survey of the chewing ability of denture wearers. *J Dent Res* 1951; 30: 314-21.
4. Gunne HS. Mastication efficiency and dental state. A comparison between two methods. *Acta Odontol Scand* 1985; 43: 139-46.
5. Carisson GE. Masticatory efficiency: the effect of age, the loss of teeth and prosthetic rehabilitation. *Int Dent J* 1984; 34:93-7.
6. Kapur KK, Garrett NR. Studies of biologic parameters for denture design. Part II: Comparison of masseter muscle activity, masticatory performance and salivary secretion rates between denture and natural dentition groups. *J Prosthet Dent* 1984; 52:408-13.

7. Garrett NR, Kapur KK, Jochen DG. Oral stereognostic ability and masticatory performance in denture wearers. *Int J Prosthodont* 1994; 7:567-73.
8. Fontijn-Tekamp FA, Slagter AP, van der Bilt A, et al. Biting and chewing in overdentures, full dentures and natural dentitions. *J Dent Res* 2000; 79: 1519-24.
9. Yamashita S, Sakai S, Hatch JP, Rugh JD. Relationship between oral function and occlusal support in denture wearers. *J Oral Rehabil* 2000; 27:881-6.
10. Shinkai RS, hatch JP, Sakai S, et al. Oral function and diet quality in a community-based sample. *J Dent Res* 2001;80:1625-30.
11. Agerberg G, Carlsson GE. Chewing ability in relation to dental and general health. Analyses of data obtained from a questionnaire. *Acta Odontol Scand* 1981; 39(1):147-53.
12. Witter DJ, van Palenstein Helderma WH, Creugers NH, Kayser AF. The shortened dental arch concept and its implications for oral health care. *Community Dent Oral Epidemiol* 1999; 27(4):249-58.
13. Steele JG, Ayatollahi SM, Walls AW, Murray JJ. Clinical factors related to reported satisfaction with oral function amongst dentate older adults in England. *Community Dent Oral Epidemiol* 1997; 25(2):143-9.
14. Frank RP, Milgrom P, Leroux BG, Hawkins NR. Treatment outcomes with mandibular removable partial dentures: a population-based study of patient satisfaction. *J Prosthet Dent* 1998; 80(1):36-45.
15. Smith, BJ. Esthetic factors in removable partial prosthodontics. *Dent Clin North Am* 1979; 23(1):53-63.
16. Elias AC, Sheiham A. The relationship between satisfaction with mouth and number and position of teeth. *J Oral Rehab* 1998 ; 25(9):649-61.
17. Zarb GA, Bergman B, Clayton JA, MacKay HF. Prosthodontic treatment for partially edentulous patients. St. Louis: C.V. Mosby; 1978.
18. Feldman RS, Alman J, Muench ME, Chauncey HH. Longitudinal stability and masticatory function of human dentition. *Gerodontology* 1984; 3(2):107-13.
19. Agerberg G. Mandibular function and dysfunction in complete denture wearers - a literature review. *J Oral Rehabil* 1988; 15(3):237-49.
20. Chauncey HH, Kapur KK, Feller RP, Wayler AH. Altered masticatory function and perceptual estimates of chewing experience. *Spec Care Dentist* 1981; 1(6):250-5.
21. Krall E, Hayes C, Garcia R. How dentition status and masticatory function affect nutrient intake. *J Am Dent Assoc* 1998; 129(9):1261-9.
22. Moynihan PJ, Butler TJ, Thomason JM, Jepson NJ. Nutrient intake in partially dentate patients: the effect of prosthetic rehabilitation. *J Dent* 2000; 28(8):557-63.