Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Case report

Full mouth rehabilitation of a case of rampant caries using a twin-stage procedure

Maj S. Anil Kumar^{a,*}, Col V. Radhakrishnan^b, Col Harbir Singh Sandhu^c,
Brig N.K. Sahoo^d

^a Graded Specialist (Prosthodontics), Military Dental Centre, Secunderabad 500015, India

^b Commanding Officer & Classified Specialist (Oral and Maxillofacial Surgery), Military Dental Centre, Secunderabad 500015, India

^c Commandant & Command Dental Advisor, Classified Specialist (Prosthodontics), CMDC (NC), India

^d Prof & HOD (Oral and Maxillofacial surgery), Dept of Dental Surgery, AFMC, Pune 411040, India

ARTICLE INFO

Article history:

Received 14 July 2011

Accepted 2 September 2012

Available online 1 December 2012

Keywords:

Full mouth rehabilitation

Rampant caries

Twin stage procedure

that, “the condylar path shown to have deviation within the individual and its influence on disocclusion is minimal”.^{1,2} Their twin stage technique develops anterior guidance to create a predetermined, harmonious disocclusion with the condylar path. Condition 1 is used to incorporate a cusp shape factor and condition 2 is used for the angle of hinge rotation.³

This article presents prosthodontic rehabilitation of a patient with rampant caries, severely worn dentition and uneven occlusal plane has been treated using twin stage procedure.

Case report

A 26 year old female reported to the Department of Prosthodontics, Army Dental Centre Research and Referral, New Delhi with a chief complaint of multiple decayed teeth and unsightly appearance since few years which is getting deteriorated over a period of time. Patient did not give any medical history and was free from TMJ disorders.

Clinical examination

Extraoral: No facial asymmetry, No abnormality in the TMJ. Intraoral: Multiple decayed upper and lower dentition with poor oral hygiene. The missing teeth were 24, 26, 36, 37 and 46. Root stumps i.r.t 17, 27, 28, 42, 48 and 45 were present [Fig. 1]. Fractured amalgam restoration i.r.t 16. The patient presented

Introduction

Rampant caries is defined as suddenly appearing, widespread, rapidly burrowing type of caries resulting in early involvement of pulp. Patients affected with rampant caries often have compromised aesthetics and function. Restoration of the carious lesion is a challenge since they are deeply burrowing into the enamel and dentine. Anterior guidance is crucial in human occlusion because it influences molar disocclusion that controls horizontal forces. Molar disocclusion is determined by a cusp-shape factor and an angle of hinge rotation. The three factors which determine disocclusion are: condylar path, incisal path and cusp angle. Hobo and Takayama stated

* Corresponding author. Tel.: +91 9490740008 (mobile), +91 9999333140 (mobile).

E-mail address: anilks.undefiend@gmail.com (S. Anil Kumar).

0377-1237/\$ – see front matter © 2012, Armed Forces Medical Services (AFMS). All rights reserved.

<http://dx.doi.org/10.1016/j.mjafi.2012.09.003>

with a bilateral class I canine relationship. There were multiple fractured light cure restorations. The vertical dimension was adequate.

Treatment procedure

Extraction of the root stumps i.r.t 17, 27, 28, 42, 48 and 45 and Root canal treatment of 21, 22, 23, 31, 32, 33, 34, 35, 41, 43, 47 was performed [Fig. 2]. Repair of the fractured amalgam restoration i.r.t. 16 was done. Light cure composite core build up of the decayed teeth was carried out. Maxillary and mandibular impressions were made in the alginate impression material and diagnostic casts were obtained. The maxillary cast was mounted using face-bow transfer onto a semiadjustable arcon articulator (Whip-mix) and the mandibular cast mounted using the Lucia jig and centric relation record. Diagnostic wax-up was done on the mounted models to see the final outcome [Fig. 3]. Custom guided incisal table were fabricated with autopolymerizing resin (one with the eccentric movements with anterior segment detached and the second table after the anterior segment was placed back) to simulate the anterior guidance. Before doing the tooth preparation the vertical dimension of occlusion was recorded. Temporary fixed partial dentures of maxillary and mandibular arch were fabricated using the putty index of the diagnostic wax-up. The teeth were prepared in the maxillary arch first and the temporary fixed dental prosthesis was cemented following which the lower teeth were prepared and temporary fixed dental prosthesis cemented with ZnO non eugenol cement [Figs. 4 and 5]. Since the teeth were severely affected by the caries all the active carious lesions were removed while teeth were prepared but the teeth were discoloured having arrested caries in few

Fig. 2 – Pre and post op OPG.

teeth. Maxillary and mandibular interim removable dental prosthesis were fabricated for the missing posterior teeth. A final full arch impression for maxillary/mandibular teeth was made using heavy-body and light-body impression material and poured in die stone. This assembly was mounted on

Fig. 1 – Pre-operative intraoral.

Fig. 3 – Diagnostic wax-up.

whip-mix articulator using the face-bow, Lucia jig and centric record at the predetermined vertical dimension to fabricate the wax patterns. The maxillary and the mandibular models with the wax patterns in place were surveyed using a micro-surveyor. Occlusal rests and guiding planes

were carved out in the wax pattern and the wax patterns were cast. The metal copings were tried in [Fig. 6]. Definite restorations with PFM crowns were fabricated. Before doing the final glaze of the crowns the restorations were placed on the maxillary and mandibular master cast and surveyed for

Fig. 4 – Tooth preparation and gingival retraction.

Fig. 5 – Provisional restorations and RPD inserted.

the fabrication of cast removable partial dentures. After performing the modifications required on the bisque baked crowns the models were articulated back with the restorations onto the whip mix articulator. The articulator was programmed to different conditions of the twin-stage procedure as in Table 1.

A standard effective cusp angle of 25° was set to condition 1 as depicted in Table 1. Maxillary and mandibular anterior segment was removed. The occlusal morphology of the posterior Porcelain fused to metal crown build-ups was completed and balanced articulation was obtained. The anterior segment of the cast was reassembled and anterior PFM crown build-ups were completed after the values had been adjusted to condition 2 of the twin stage procedure

[Table 1]. This helps to achieve an incisal guidance of 40° which produces a standard amount of disocclusion. The anterior teeth produced contact on anterior teeth during protrusion and contact on canines during lateral movement. Permanent cementation was done with GIC type I luting cement. Maxillary and mandibular impressions were made with heavy body and light body impression material to obtain a master cast. Designing was done on the master cast for cast removable partial denture; wax pattern was fabricated invested and casted. A special tray was fabricated on the mandibular framework. Border moulding and final impression of the distal extension edentulous space was made with ZnO eugenol impression paste and the master cast was altered (Altered Cast Technique). Jaw relations

Fig. 6 – Metal coping try-in.

Table 1 – Illustrates the angulations to be set on the articulator for fabrication of restorations.

	Condylar path		Anterior guide table	
	Sagittal condylar path inclination	Bennett angle	Sagittal inclination	Lateral wing angle
Condition 1	25	15	25	10
Condition 2	40	15	45	20

Fig. 7 – Insertion of PFM crowns and cast RPDs.

were taken with the removable dentures intraorally, teeth setting were done and trial was taken. The dentures were acrylised finished and inserted. Follow up was done once in 15 days for a period of 3 months and the patient's post operative condition was found to be satisfactory [Figs. 7 and 8].

Fig. 8 – Post op extraoral.

Discussion

Rehabilitation of patients with compromised dentition is a challenge in terms of establishing function and aesthetics for the patient. Full mouth rehabilitation involves rehabilitation with fixed partial denture and removable partial denture. All patients cannot be rehabilitated with fixed partial denture, some exceptional cases where fixed prosthesis is not indicated removable partial denture is the treatment of choice. There are alternative restorative procedures for the rehabilitation of mutilated teeth.^{3–9} Each method has limitation and it should be critically reviewed prior to deciding a treatment plan. The treatment for patients with mutilated teeth is related to many factors including the age of the patients, the socio-economic status, the type and severity of the disorder. Treatment plan should have common goal-functional, aesthetic and longevity of restoration. Restoring full mouth with twin stage procedure has its own advantage as the basic concept involved in the new procedure reproduce the occlusal morphology of the posterior teeth without the anterior segment and produce the cusp angle coincidence with standard values of effective cusp angle. Secondly, reproduce anterior morphology with the anterior segment and provide anterior guidance which produces a standard amount of disocclusion. The anterior guidance and the patient's condylar inclination might or might not be in harmony. The amount of disocclusion changes in patient's mouth, as this technique followed a fixed value of 40° of condylar inclination. So the amount of disocclusion varies from the predetermined value.

Implants have replaced the removable partial dentures in the recent times.¹⁰ But in some compromised situations it is difficult to place implants and hence removable partial dentures are the alternative to restore the function.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Hobo S, Takayama H. Effect of canine guidance on the working condylar path. *Int J Prosthodont*. 1989;2: 73–79.
2. Hobo S. Twin-tables technique for occlusal rehabilitation: part I: mechanism of anterior guidance. *J Prosthet Dent*. 1991;66.
3. Soares CJ, Fonseca RB, Martins LR, Giannini M. Esthetic rehabilitation of anterior teeth affected by enamel hypoplasia: a case report. *J Esthet Restor Dent*. 2001;14: 340–348.
4. Crabb JJ. The restoration of hypoplastic anterior teeth using an acid-etched technique. *J Dent*. 1975;3:121–124.
5. Peumans M, Van Meerbeek B, Lambrechts P, Vanharle G. Porcelain veneers: a review of the literature. *J Dent*. 2000;28:163–177.
6. Zalkind M, Hochman N. Laminate veneer provisional restorations: a clinical report. *J Prosthet Dent*. 1997;77:109–110.
7. Karlsson S, Landahl I, Stegersjo G, Milleding P. A clinical evaluation of ceramic laminate veneers. *Int J Prosthodont*. 1992;5:447–451.
8. Meijering AC, Creughers NH, Roeters FJ, Mulder J. Survival of three types of veneer restorations in a clinical trial: 2.5-year interim evaluation. *J Dent*. 1998;26:563–568.
9. Rucker LM, Richter W, MacEntee M, Richardson A. Porcelain and resin veneers clinically evaluated: 2 year results. *J Am Dent Assoc*. 1990;121:594–596.
10. Survival and complication rates of combined tooth-implant-supported fixed and removable partial dentures. *J Prosthet Dent*. 2008;100:237.