REPLACING EXISTING DENTURES BY COPY-DENTURE TECHNIQUE FOR GERIATRIC PATIENTS: A CASE REPORT

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Patients requesting replacement complete dentures have often worn the same set of dentures, successfully for many years. They have become accustomed with the fitting, polished and occlusal surfaces of their dentures. Patients should be provided with prosthesis which optimize esthetics, phonetics and function along with preserving the health of existing oral structures. Physical and mental adaptability of patients is of utmost importance in achieving success in complete denture therapy. This case report presents a method of complete denture fabrication along with its clinical and laboratory steps, which involve replicating the desired features of the prosthesis, along with improvements in esthetic, occlusion and stability, utilizing a three visit copy denture technique.

KEY WORDS: Copy denture, Existing dentures Replacing Techique Geriatric patiant.

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INTRODUCTION

The treatment of patients who need complete dentures, challenges the skills of a dentist. One concern is the clinical and technical aspect of denture fabrication; the other is the general physical health, local oral factors and psychological well being of the patient. These latter factors can be as important as the clinical and technical treatment aspects in the potential success of treatment[1-4]. The increased life expectancy of the elderly edentulous population augments the challenge of restoring mastication, phonetics and esthetics for these patients[5].

Dissatisfaction with complete dentures is a common phenomenon, Van Waas and others have reported that 25% of denture wearers have severe problems with their dentures[6,7]. Complaints about discomfort and instability often occur and many denture wearers report difficulties during mastication and phonetics[8]. With the advancements in techniques and materials, and the introduction of the implant supported prosthesis, the satisfaction level of edentulous patients with their prosthesis has increased[9]. However, a great challenge to the clinician is to make a decision in providing the patient with a conventional complete denture which is simple, quick and less challenging clinically and technically or to provide implant retained dentures which require increased cost, time and maintenance. Provision of a replacement complete denture to an elderly complete denture wearer is one of these challenges faced by a treating dentist[10].

Adaptation to replacement dentures is a continuous struggle for the elderly especially, when major changes are made on the occlusal and fitting denture surfaces [11]. The patients which pose the greatest threat are the ones with systemic disorders such as Parkinson's, dementia and physically frail. A clinician must appreciate that the degree of adaptive capability of old denture wearers is also related to the health of the supporting tissues, their neuromuscular coordination, and their motivation for learning new skills[12,13]. Patient with old and inadequate prosthesis are still able to persevere with them due to muscular control developed over a long period. However, a new prosthesis requires the development of a new learning sequence and the will to be persistent. Therefore, it is important to identify patients who may have difficulty adapting or are unwilling to learn new skills[14, 15]. In these cases, existing dentures are extremely valuable for diagnosis and treatment planning. Most existing dentures, whether or not they have been worn successfully, provide extremely valuable information for all stages of treatment[16]. These patients will benefit from treatment that makes minimum change from the old to new dentures, such as the use of the Copy (duplicate) Denture technique because it

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makes an easier transition to the new prosthesis[15-17]. Copy dentures enhance neuromuscular adaptation to new dentures, reduce patient-clinician chair side time, reduce laboratory steps, require fewer patient visits, make jaw relation registration simple, provide technical staff with more guidance to tooth position and moulds, allows for copying esthetics and are cost effective[18,19]. Since the desirability of copying was recognized by Fenn et al in 1953, several methods have been evolved, most of which are based upon the production of replica dentures from impressions of the existing appliances to form the basis of the new appliances[4,15-18, 20-21, 23-24]. There is evidence to suggest that both the dentist and the dental technician have a clear understanding of the rationale behind the copy technique and why the technique is being used for a particular patient; it is likely that the prescription will not be followed accurately by the dental laboratory[21].

This case report presents a method of complete denture fabrication along with its clinical and laboratory steps, which involves replicating the desired features of the prosthesis along with improvements in esthetic, occlusion and stability utilizing a three visit copy denture technique.

CASE REPORT

An 83 yr old male, reported to the Department of Prosthodontics, (Study setting removed). The patient was a complete denture wearer, using the existing dentures for the last 14 yrs. He complained of loose, discolored dentures and had difficulty in mastication. The patient was medically fit and well. Extra oral examination showed decrease in occlusal vertical dimension (OVD). In the intraoral examination the oral and denture hygiene was found to be satisfactory. The upper arch was U shaped while the lower arch was highly resorbed and depressed (Figure1). Due to resorption in the lower arch the bellies of mentalis muscle were very prominent. There was no intraoral pathology and adequate salivary flow was present. Inspection of the previous dentures exhibited discoloration and worn occlusal surfaces (Figure2). Denture examination exhibited lack of retention and stability, non-balanced occlusal contacts, worn teeth resulting in reduced occlusal-vertical dimension (OVD). A diagnosis of ill-fitting, discolored complete dentures with occlusal wear, decreased OVD and occlusal disharmony was made.

Figure 1. Intraoral views of the maxillary and mandibular arches.

Figure 2. Existing (old) dentures of the patient.

The treatment options available were:

- Provision of new complete dentures fabricated by conventional denture fabrication technique.
- Provision of new complete dentures fabricated by copy denture technique.
- Implant supported over-dentures.

The objective was to provide new retentive and stable complete maxillary and mandibular dentures with acceptable function and esthetics with limited patient visits. The age of the patient and the relatively better evidence of the adaptation to the existing complete dentures was a clear indication for the use of copy denture technique. All options including their risks, benefits etc were explained to the patient and the patient opted for new complete dentures by the copy denture technique.

The treatment was planned in three stages. At the first visit, impressions of the existing dentures were recorded using stock impression trays and irreversible hydro-colloid (alginate) for fabrication of the template

dentures. Initially, the occlusal and polished surfaces of the dentures were embedded in the alginate mix, once complete set was achieved; grooves were cut

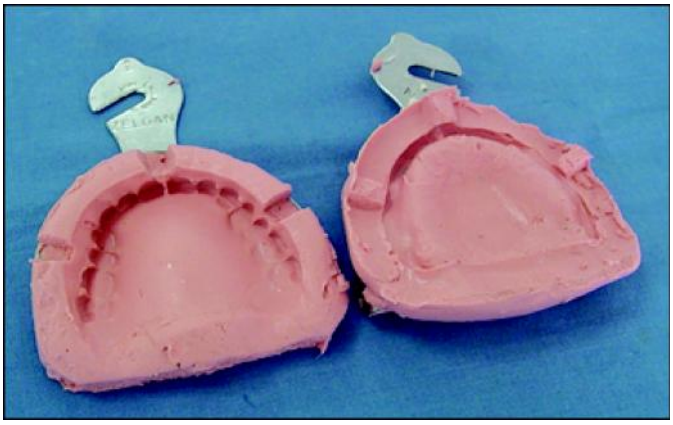


Figure 3. Moulds of the existing dentures after impression with alginate.

within the impression before the placement of the second tray. The fitting surface was then invested in a second mix of alginate and allowed to set undisturbed and stationary. Later, impression trays were separated and the dentures were recovered from their moulds (Figure3). Subsequently, in the clinic, after cutting sprue channels (Inlet & Exit), a thin mix of the pouring type chemically curing acrylic resin was poured into the moulds (recorded impressions for the old dentures earlier). Two halves (impression of the polished/occlusal and

Figure 4. Acrylic resin replicas/copy templates made by pouring mix of cold-curing resin in the alginate moulds.

impression surface) of the moulds were secured with the help of grooves and rubber bands. After setting of the resin the template dentures (self cure dentures in pink color) were then removed from the moulds (Figure4).

The acrylic template replica dentures were then used for corrections in the maxillo-mandibular relations. In the first place the changes in the occlusal vertical dimensions were made. This was followed by registering the retruded position of the mandible and the face bow transfer record. Before the original dentures were returned to the patient, shade of the existing denture teeth were recorded and the patient was discharged for the day.

Using the new maxilla-mandibular records, the replica dentures were mounted in the articulator with the face bow record and inter-occlusal centric relation record in wax (wax wafer) as recorded earlier (Figure 5). Arrangement of teeth was then carried out

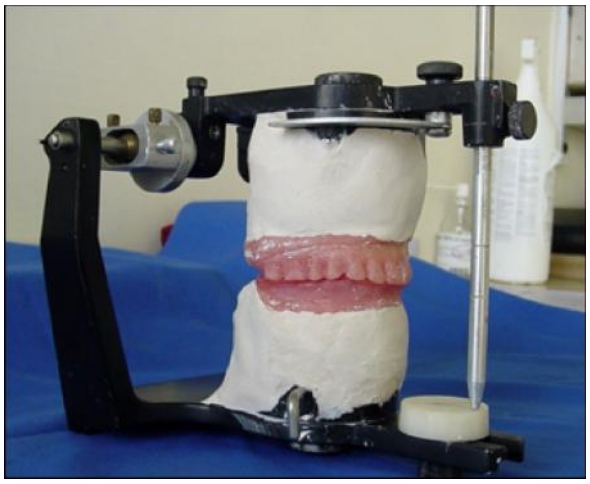


Figure 5. Mounted copy templates using face-bow and centric relation record.

in the laboratory by removing acrylic resin and replacing with a tooth, one tooth at a time, without disturbing the buccolingual position of the teeth (Figure6).

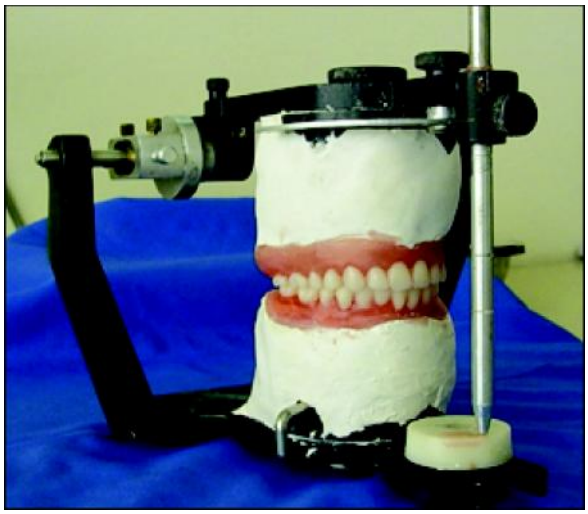


Figure 6. Arrangement of Teeth On Copy Templates

At the second clinical visit, the trial of the dentures was done and functional reline impressions were recorded in the trial dentures using zinc oxide paste (Figure7). Investing of the denture in flasks, de-waxing,

Figure 7. Reline impressions recorded at the trial dentures stage.

packing the mould with resin and curing of the dentures was then completed in the laboratory. After finishing and polishing the dentures were ready for insertion (Figures 8 & 9).

In the third and final visit the dentures were fitted intra-orally after minor adjustments. The patient was

Figure 8. Finished and polished dentures.

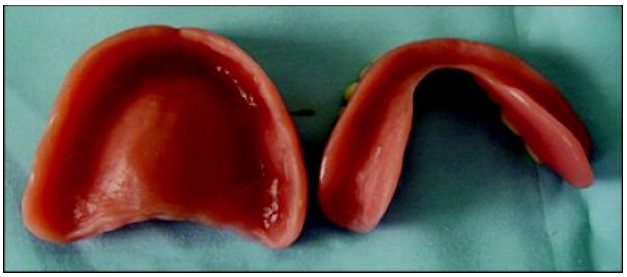
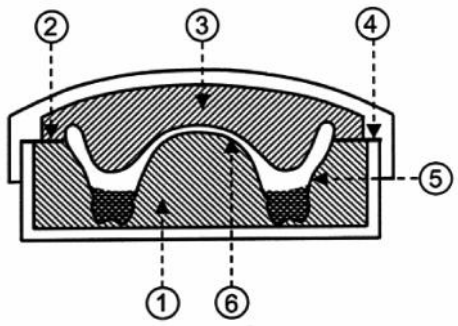


Figure 9. Impression surfaces of new dentures.

called for review and follow up visit at 24 hours post-operative and after 1 week. During the follow up visits the patient was found to be satisfied with the function,



esthetics, occlusion and phonetics of the new dentures. This method is simple and utilizes materials and

Table 1: Clinical and Laboratory procedures at each Visit.

Patient Visit	Stage	Clinical Steps	Suggestions
1.	Clinical	Diagnosis and treatment plan If the pt. is suitable for copy dentures then;Invest/Impression of dentures to be copied.	List those aspects of the existing dentures that will be modified and those aspects that will be copied.
	Lab	Construct copy templates with self cure acrylic resin.	
	Clinical	Record Maxillo-mandibular relation using replica denture	
	Lab	Mounting of the Copy Templates. Arrangement of teeth for trial dentures.	It is important to remove/grind only one or two teeth from the templates at a time so that the remainder acts as effective guides to accurate positioning of the new teeth.
2.	Clinical	Denture trial for the patient. Take reline impressions within the templates in wash-viscosity elastomeric / zinc oxide eugenol impression material.	Record the wash impression with close-mouth impression method.
	Lab	Final wax up, Flasking, Dewaxing, Packing of acrylic, Curing, Finishing and Polishing of dentures.	If it is required wax can be added to the acrylic palate and wax up is finalized before flasking. During the Flasking, Dewaxing and Packing, the remaining cold curing resin and impression material are discarded and the flask is packed with heat cure acrylic resin.
3.	Clinical	Denture insertion	Selective spot grinding of the new teeth intraorally. Patient put on review / recall

equipment commonly available in almost all dental surgeries[20].

The various clinical and technical stages of a copy denture technique are summarized in Table-I. It is possible to undertake more than one clinical stage at the same appointment.

DISCUSSION

Provision of replacement complete dentures for an increasingly elderly population presents problems for the prosthodontist. This is due to reduced adaptability to new prosthesis because of decreased neuromuscular skills in geriatric patients[22]. The existing denture that needs to be replaced due to wear, tooth loss, discoloration, chipped and cracked bases provides the dentist with many useful information in planning new dentures. It is therefore helpful to reproduce familiar features of a patient's old prosthesis, especially if these have been used successfully for some years[23-26]. With replacement dentures, copying of suitable features using a copy denture technique is indicated[24]. The existing denture provides superior trays and registration of maxilla-mandibular relations are easy and more predicable in terms of accuracy. With copy dentures information available in the patients existing dentures is used to simplify and quicken the procedure of making new dentures[23-24]. A local publication of a case report has described the benefits of the copy dentures and a technique of using copy denture flask specifically designed for duplicating existing dentures[24]. This techniques of obtaining replica dentures from the moulds of existing denture obtained in laboratory alginate or laboratory silicone as a duplicating material in copy denture flasks as described by Basker and Davenport[20] and Ghani[24] is widely employed all over the world. However, in case, these denture duplicating flasks are not available, then the trays technique and method may be used for obtaining the replicas of the existing denture as is the case in the present study.

The current case presented is a classical example of fabrication of the replacement dentures by the copy denture technique. Also, at the treatment option discussion, the patient wanted minor modifications within the existing dentures for improved comfort and function. Implant retained over-denture was not feasible for the patient due to high cost and surgical morbidity (advanced resorption). Relining was not suitable due to history of previous failed attempts and existing denture problems like, discoloration, flat occlusal surfaces and unstable dentures. All of these issues led to the indication of new replacement complete dentures with copy technique. This technique helped to reduce the patient's clinical chair-side time as well as the reduction in appointments. With the new teeth there was improvement in the esthetics as well as chewing efficiency, and reduced OVD was improved with the new jaw relation record. Finally, well fitting new complete dentures was a direct result of the new impression surfaces.

The clinical value of a copy denture method enabling reproduction of selected features of old dentures compared to fabrication of new complete dentures in replacements is no longer in doubt[26]. The success of the present and earlier methods using copy technique in overcoming problems arising from disparities between new and old dentures constitutes a powerful argument for more widespread application of such a method as first line of treatment for appropriate indications[22-26].

CONCLUSION

For elderly and frail patients who have used their old dentures successfully for a significant period of time, provision of replacement complete dentures by copy denture technique is a simple and cost effective procedure. The replacement dentures will have better adaptability with reduced chair-side and laboratory time.

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