

CASE REPORT

Multiple suction cup dentures-a rejuvenation of the centenarian – A Case report.

Rupkumar P,^a Meenakshi Akshayalingam,^b Prabha T^c

ABSTRACT

The heart of prosthodontics, whether it is a Removable denture, Obturator or Maxillofacial prosthesis, the first goal is the Retention. The best mode of retention is always the remaining oral soft tissues, bone and teeth. But not always hard and soft tissues provide the desired retention. So in these types of cases the mode of retention is generally from implants, extraoral supports and pre prosthetic surgery which are quite invasive, complicated and expensive. This paper is all about a simple technique which aids in achieving retention in the removable complete denture patients with resorbed ridge, knife edge, and flabby ridge in an inexpensive, time saving noninvasive and least complicated way using a heat-cured multi-cup silicone liner. This technique solves many of the physiologic and psychologic problems associated with denture wearing with compromised retention

Keywords: Multiple suction cup, Molloplast Permanent soft liner, Trepine Tissue punch.

How to cite this article: Rupkumar P, Meenakshi Akshayalingam, Prabha T. Multiple suction cup dentures-a rejuvenation of the centenarian – A Case report. *J Clin Prosth Impl* 2023;5(2):59-62. <https://doi.org/10.55995/j-cpi.2023013>.

INTRODUCTION

In the era of implants and bone grafting, there are many patients who are either unaffordable to go for implants or their systemic health is so compromised and are contraindicated for implants. Therefore this technique is designed to provide satisfactory result in these kinds of patients. This procedure involves incorporating multiple suction cups on the intaglio surface of the denture. These cups create a vacuum beneath therefore increases the retention and stability of the denture. Though this concept is not new to dentistry, earlier quacks tried using this technique with a single suction cup and heavy force which resulted in lot of palatal perforation and mucosal hyperplasia. Later in 1976 Jermyn discovered this technique of multiple suction cup denture after many research work in this concept proved this technique a successful one.¹ Although Jermyn technique was successful it did not become very popular in India due his usage of silastic liner material which is available only with the European traders. Englemmeir later used Molloplast in place of silastic with a special -drill for the master cast preparation,² which was quite cumbersome to fabricate the customized drill. To overcome all these difficulties, we have used molloplast liner and trephine tissue punch which are readily available in Indian market at lower cost

CASE DESCRIPTION

A 60 year old male patient, reported to the department of Prosthodontics with bad experience of wearing multiple loose complete dentures also who has uncontrolled diabetes with other related systemic problems for past 15 years. He belongs to an economically weaker section too. Intra oral examination revealed class I Ridge relationship with flabby maxillary ridge and flat mandibular ridge with sufficient vertical dimension. So we planned for a multiple suction cup Complete dentures. Discontinuation of the previous denture is recommended for 2 days for the conditioning of the tissues. Primary impression taken with impression compound and primary cast is poured with dental stone. Special tray is fabricated with self-cure acrylic resin and border moulding done with green stick compound and Secondary impressions were made with light body condensation silicone. The master cast is poured with good quality dental stone (poor quality stone are brittle and die stone are too hard to prepare multi cup trephine). Jaw relations were recorded. Articulation done on mean value articulator and teeth setting with Acryl rock and wax try in was done and checked for vertical dimension, centric relation phonetics, esthetics and all were found satisfactory.

^a Associate Professor, Department of Prosthodontics and crown and Bridge, Tamilnadu Government Dental College and Hospital, Chennai.

^b Professor, Department of Prosthodontics and crown and Bridge, Tamilnadu Government Dental College and Hospital, Chennai.

^c Postgraduate, Department of Prosthodontics and crown and Bridge, Tamilnadu Government Dental College and Hospital, Chennai

MASTER CAST PREPARATION FOR MULTICUP SUCTION

Small punches are given all over the surface of the master cast leaving 2mm from the sulcus and frenum area. The depth of the punches should be 1mm and the distance between two punches should be 1.5 to 2mm approximately. These punches were made with the help of 2mm trephine tissue punch with contra angle handpiece used in micromotar [Fig. 1, 2].



Figure 1: Prepared master cast



Figure 2: punch hole drilling with tissue punch and contra angled handpiece



Figure 3: Conventional dewaxing



Figure 4: Wax spacer adaptation for accommodation of soft linner

The wax tried denture base is fused with master cast for proper peripheral sealing so that the plaster don't enter the space between the record base and cast during flasking conventional packing & dewaxing is carried out [Fig. 3]. 2mm wax spacer is adapted on the ridge of the master cast [fig 4] which provides the space for the permanent soft lining. Heat cure acrylic resin is packed and bench cured for 1 hour, flask is opened carefully and the molloplast adhesive is applied on the partially cured acrylic resin [Fig. 5] and dried for 15 mins. After the drying time heat cure molloplast permanent soft liner is packed and cured in water bath for 2 hours in 100°C [Fig. 6].

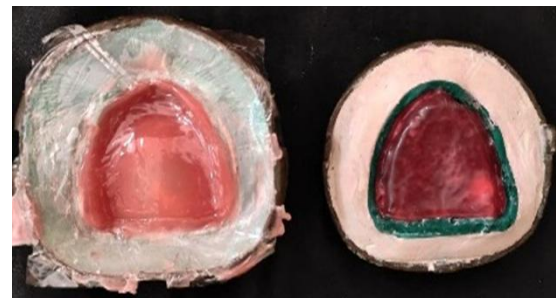


Figure 5: Partially cured heat cure resin



Figure 6: Packing of molloplast



Figure 7: Intaglio surface of suction cup denture



Figure 8: Cameo surface of suction cup denture



Figure 9: Post insertion smile

Since the molloplast is a single component heat cure resin we have enough working time and there is least possibility for manipulation errors. After gradual cooling the flask is opened and the denture retrieved. Trimming done with the help of acrylic stones, molloplast finishing burs and polishing done with pumice for acrylic part and molloplast polishing cup for the soft liner part [Fig. 7] and finally our multiple suction cup denture is ready for the insertion [Fig. 8]. Denture insertion done and post insertion instructions given and patient reviewed periodically [Fig. 9].



Figure 10: Retention assessment with forcemeter

Types of dentures	Dislodgement force for Upper denture	Dislodgement force for Lower denture
Conventional denture	0.71	0.05
Suction cup denture	2.65	0.25

Table 1: Force meter evaluation

DISCUSSION

According After 1 week of follow up patient had increased retention, stability and tissue tolerance, no evidence of inflammation was seen. Patients masticatory efficiency was much better than the conventional dentures. Oblique force test was done to evaluate the retention of the denture with ice cream stick. Results proved denture was very stable. Peanut chewing test was performed to check the masticatory efficiency and the patient was able to chew the peanut with full efficiency. Retention of dentures were evaluated using Force Meter and found that Suction cup dentures were 5 times more retentive than the conventional dentures [Fig. 10] Post insertion maintenance Proper cleaning and maintenance of the denture is must. Care should be taken not to use hard brush which may remove the surface details in intaglio surface. Immersion in dilute sodium hypochlorite solution also was more effective against the fungal growth. Therefore, advised denture cleansing tablets

CONCLUSION

Therefore this technique will be a blessing for those unfortunate patients with highly resorbed ridge and medically compromised patient in whom implants are contraindicated. Punching holes in the master cast in the only tedious processes, if it is done properly with caution this technique will make wonders and great change in the patient's life style. Though This article is demonstrate the multiple cup suction technique in complete denture, this can be incorporated in all kind of removable dentures including partial dentures and maxillofacial prosthesis.

CONFLICT OF INTEREST

There is no conflict of interest

REFERENCES

1. Jermyn A C. Multiple suction cup dentures. *J Prosthet Dent* 1967; 18: 316–325.
2. Engelmeier R L, Gonzalez M L, Harb M. Restoration of the severely compromised maxilla using the multi-cup denture. *J Prosthodont* 2008; 17: 41–46.
3. Schmidt W F Jr, Smith D E. A six-year retrospective study of Molloplast-B-lined dentures. Part II: liner serviceability. *J Prosthet Dent* 1983; 50: 459-465.
4. Ryan J E, Twenty-five years of clinical application of a heat-cured silicone rubber. *J Prosthet Dent* 1991; 65: 658-660.
5. Baysan A, Whiley R, Wright P S, Use of microwave energy to disinfect a long-term soft lining material contaminated with *Candida albicans* or *Staphylococcus aureus*. *J Prosthet Dent* 1998; 79: 454–458
6. Atassi M, Milleman KR, Burnett GR, Sanyal S, Milleman JL. A randomized clinical study to

evaluate the effect of denture adhesive application technique on food particle accumulation under

dentures. Clin Exp Dent Res. 2019 Jun 17;5(4):316-325. doi: 10.1002/cre2.168. PMID: 31452942; PMCID: PMC6704053

Corresponding Author: Dr. Prabha. T, Postgraduate, Department of Prosthodontics and Crown & Bridge, Tamilnadu Government Dental College and Hospital, Chennai.
E-mail: prabhathiyagarajan128@gmail.com, Ph.No.: +91 8870018964

Copyright by the Editorial board for The Journal of Clinical Prosthodontics and Implantology