Submitted: Oct 27, 2025 | Accepted: Dec 29, 2025
Vol. 8/No. 2/July-December, 2025 Case Report

Custom Dual Impression Tray Technique: A Case Report on Management of Flabby Maxillary Ridge

Kerishna Kansakar[1], Shaishav Dhital[2], Barsha Ghimire[3]
[1]Post- graduate Resident, Department of Prosthodontics, Kantipur Dental College, Kathmandu
[2]Assistant Professor, Department of Prosthodontics, Kantipur Dental College, Kathmandu
[3]Associate Professor, Department of Prosthodontics, Kantipur Dental College, Kathmandu

ABSTRACT

With an increased prevalence of edentulousness, dentists can encounter individuals who are partially edentulous in the mandible and completely edentulous in the maxilla. This clinical scenario commonly presents with flabby tissue in the maxillary ridge. Flabby tissue is challenging to manage as this affects the stability and retention of the prosthesis. Such cases can be managed by surgical approach, by use of implants or by conventional method where we use various impression techniques to carefully capture the flabby tissue. This case report describes the use of customized dual impression tray based on the modification of Osborne's technique which was developed by Devlin to manage flabby maxillary ridge in a patient.

Keywords: Complete Denture; Dowel Pin; Dual Impression Tray; Impression; Mucostatic Impression.

INTRODUCTION

Fabrication of a complete denture is in itself a technique sensitive procedure. When clinical difficulties are added such as the presence of flabby tissue the prosthesis may be ill fitting due to distortion of such tissues during impression making.[1] Flabby tissues are excessive movable tissues when the alveolar bone is substituted with hyperplastic soft tissue.[2] Histologically, it presents with loose fibrous connective tissue, dense collagen connective tissue and mucosal hyperplasia.[2] Flabby ridge is prevalent in 24 % of edentulous maxillae and 5% of edentulous mandible.[3]

The poor support provided by flabby maxillary ridge inadvertently affects the retention and stability of the denture.[4] The management strategies include surgical intervention, implant supported prosthesis and conventional approach by using various impression techniques such as selective perforation tray technique, palatal splinting using a two- part tray system, etc.[2] This case report describes the use of customized dual impression trays to manage the flabby tissue.

CASE REPORT

A 75- year- old male patient visited the Department of Prosthodontics in Kantipur Dental College with the chief complaint of wanting to replace his missing teeth. The patient gave previous history of wearing complete denture about 5 years ago. The denture was fabricated 1 month after extraction of the remaining teeth. The patient stopped wearing denture after his upper denture fractured accidentally 1 year after it was delivered. There was no significant medical history reported. On intraoral examination the flabby tissue was present in the region of anterior maxillary ridge and extended towards the region of the

Conflict of Interest: None

***Corresponding Author**
Dr. Kerishna Kansakar, Department of Prosthodontics, Kantipur Dental College, Basundhara, Kathmandu, Nepal
Phone no: 977-9841295865
E-mail: kasakeri@gmail.com

hard palate. The patient wanted a new set of dentures, therefore the process of fabricating a new complete denture was started with the consent of the patient.

Impression compound (Hiflex Impression Compound) was used to make the preliminary impression using edentulous stock trays. (Figure 2) The casts were poured using dental plaster (Kaldent Dental Plaster Class II). A layer of relief wax (Pyrax Modelling Wax) was placed over the denture bearing area 4mm short of the sulcus along with tissue stops in the maxillary and the mandibular casts. (Figure 3) The flabby area was noted in the maxillary cast and a double layer of wax was placed over it.For the maxillary cast dual impression trays were prepared as described by Devlin[2]. First a palatal tray was fabricated in which a dowel pin (Renfert Bi- V- Pin) was positioned in the center. (Figure 4) The pin was proclined in a way that guided the second custom tray to be guided in an oblique upward and backward direction. (Figure 5) Lead foil was used as a separating medium between the two trays. Lead foil (0.1mm) prevented acrylic bonding while allowing precise separation. Custom impression tray was fabricated on the mandibular cast with autopolymerizing resin (DPI RR Cold Cure Acrylic Repair Material).

The double spacer in the region of flabby tissue was removed to prevent the distortion of tissue during border molding. The custom trays were border molded using green stick impression compound (DPI Pinnacle Tracing Stick). (Figure 6) The remaining spacer was removed. In the palatal part of maxillary custom tray zinc oxide impression paste [2] (DPI Impression Paste) was used to record the flabby tissue. (Figure 7) The second tray guided the position of the palatal tray while taking the secondary impression. Tray adhesive (Medicept tray adhesive) was applied over the mandibular custom tray and the second maxillary tray. After the impression in the palatal tray was set the second tray was placed using the dowel pin as the guide. Polyvinyl siloxane (PVS) (Zhermack elite HD+ light body) impression material was used to record the impression of the remaining area. PVS was also used to record the secondary impression of the mandible. (Figure 7,8)

Plaster pumice method was used for beading and the flask was used for boxing the impression after the handles of the trays were removed. The master cast was poured and a record block was fabricated for the jaw relation. After the facebow transfer and jaw relation the casts were articulated in semi- adjustable articulator (Hanau Wide Vue). After try in, processing, finishing and polishing the denture was delivered to the patient. The patient reported after 24 hours for some adjustments. The patient visited after 2 months due to some discomfort in the mandibular denture. Overall, the patient was satisfied with the prosthesis.

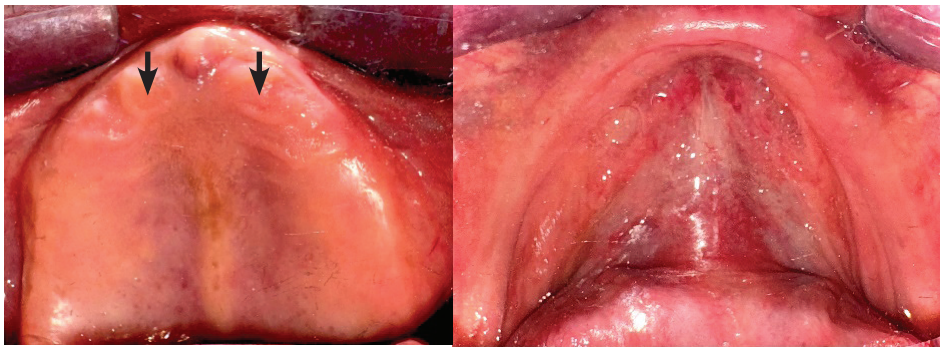

Figure 1: *Intraoral photograph of maxilla and mandible.*

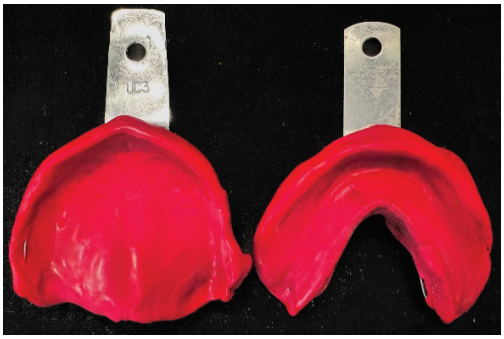

Figure 2: *Primary impression of maxilla and mandible using impression compound.*

Figure 3: *Wax spacer placed on maxillary cast.*

Figure 4: *Fabrication of palatal tray with dowel pin placed at the center and proclined posteriorly for oblique tray guidance.*

Figure 5: *Fabrication of palatal tray and secondary tray for maxilla.*

Figure 6: *Border molding of custom trays along with removal of wax spacer and application of tray adhesive.*

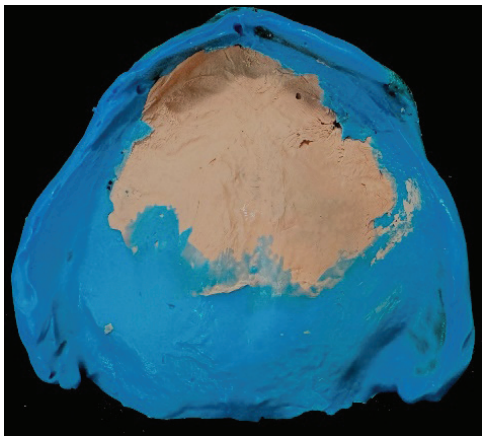

Figure 7: *Final impression of maxilla where zinc oxide impression paste has been used in the palatal tray and PVS has been used in the secondary tray.*

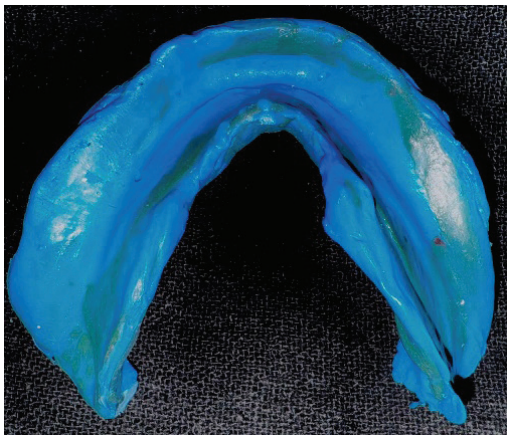

Figure 8: *Final impression of mandible.*

DISCUSSION

Anterior mandibular natural teeth opposing edentulous maxilla often leads to flabby anterior maxillary ridge.[4] The trauma directed to the soft tissue by the natural teeth leads to fibrous replacement of the bone.[4] Presence of flabby tissue compromises the denture stability and retention due to its distortion during impression making.[4] This condition can be managed by either invasive or conservative measures.

Invasive surgical procedure produces a firm denture bearing area increasing the stability of

the prosthesis.[2] However it comes with its own set of disadvantages such as reduction in sulcus depth and increase in bulk of the denture base material which replaces the removed tissue.[2] Implant retained prosthesis is a promising alternative because of enhanced stability, function and esthetics, however other factors such as general health of the patient, economic condition and operative complications should be taken into consideration.[2] Therefore conventional or conservative management of the hypermobile tissue is preferred where the fibrous tissue is registered without its displacement.[2] Denture fabricated using mucostatic impression technique gives the denture a good retention during function.[5] The loss of denture adherence during non- functional state due to the reflow of blood changing the tissue configuration of the hyperplastic mucosa is its major disadvantage.[5] The selective pressure impression technique selectively relieves the flabby tissue and applies pressure to the remaining stress bearing area of the denture.

In the current case, the two step double tray technique was utilized to preserve the contour of the deformable mucosal surface while capturing the remaining denture supporting tissues.[2] Shin et al. in 2016 found that open tray technique reduces the displacement of flabby tissue, however since this is a two- step procedure accurate repositioning of the tray is of utmost importance.[6] In addition to this, lack of tray support in the area of the hypermobile tissue can lead to casting errors while pouring the impression.[1] Thus, using a supplementary tray aligned with the primary tray minimizes deformation during casting and it also ensures an even thickness of impression material for dimensional accuracy.[1]

The present technique attempted to overcome certain limitations of Osborne's technique.[9] The incorporation of dowel pins facilitated accurate alignment of two trays, addressing the shortcoming of Osborne's method.[9] The materials used during the procedure are cost effective and readily available which makes it a feasible alternative to record impression of flabby tissues.

Although it has additional clinical and laboratory steps this technique helps to prevent deformation of flabby ridge.[7] According to a study conducted by Goma and El Mekawy single step mucostatic impression techniques produced more soft tissue displacement than two step mucostatic impression technique.[8] Ultimately the prosthesis that is fabricated provides passive fit in the area of the hypermobile tissue along with maintenance of denture retention and stability resulting in optimized patient comfort.[1]

CONCLUSION

The case report describes the use of two impression trays to record the flabby tissues without any displacement where invasive procedures are not a viable option. It represents a straightforward prosthodontic option which will ultimately enhance the well- being of the patient. The dowel pin guided dual tray technique offers a reproducible low- cost solution for flabby ridges in resource limited settings. Accurate tray repositioning eliminates the primary failure mode of classic two- part techniques. Long- term multicenter studies are recommended to validate stability of dentures beyond 2 years.

REFERENCES

1. Mostafa AZ, Alanazi SM, Almarshedy SM. Custom double tray for a special impression technique for flabby maxillary residual ridge: Case report. Clinical Case Reports. 2022 Mar;10(3):e05593. DOI: 10.1002/ccr3.5593
2. Crawford RW, Walmsley AD. A review of prosthodontic management of fibrous ridges. British dental journal. 2005 Dec;199(11):715-9. DOI: https://doi.org/10.1038/sj.bdj.4812968
3. Carlsson GE. Clinical morbidity and sequelae

of treatment with complete dentures. The Journal of prosthetic dentistry. 1998 Jan 1;79(1):17-23. DOI: https://doi.org/10.1016/S0022-3913(98)70188-X

4. Allen PF. Management of the flabby ridge in complete denture construction. Dental update. 2005 Nov 2;32(9):524-8. DOI: https://doi.org/10.12968/denu.2005.32.9.524
5. Bindhoo YA, Thirumurthy VR, Kurien A. Complete mucostatic impression: a new attempt. Journal of Prosthodontics: Implant, Esthetic and Reconstructive Dentistry. 2012 Apr;21(3):209-14. DOI: https://doi.org/10.1111/j.1532-849X.2011.00810.x
6. Shin JO, Huh YH, Cho LR, Park CJ. The Effect of Edentulous Maxillary Impression Tray Designs When Flabby Tissue Is Present: An In Vitro Study. The International Journal of Prosthodontics. 2016 Sep 1;29(5):467-72. DOI: https://doi.org/10.11607/ijp.4777 PMID: 27611750
7. Yee A, Meei TI, Ling GC. Managing Fibrous Maxillary Ridge: A Case Series of Impression Techniques. Primary Dental Journal. 2023 Mar;12(1):51-6. DOI: https://doi.org/10.1177/20501684231153909
8. Gomaa A, El Mekawy N. Impact of various impression techniques on maxillary flabby ridge tissue displacement (within-subject evaluation). Egyptian Dental Journal. 2017 Jul 1;63(3-July (Fixed Prosthodontics, Dental Materials, Conservative Dentistry & Endodontics)):2681-9. DOI: https://doi.org/10.21608/edj.2017.76228
9. Bhatia P, Tripathi S, Agarwal S, Madan R**.** An ingenious approach of recording the flabby ridge in construction of complete denture. Indian Journal of Applied Research. 2019;9(5):1–2.