



Variation in impression procedures for difficult edentulous situations: 3 Case reports

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Abstract

Impression making for a completely edentulous situation is a vital step to ensure a good denture prognosis. However in day to day clinical practice, apart from routinely found completely edentulous cases, there are special edentulous situations like advanced mandibular ridge resorption, flabby tissue in the edentulous area, patients with reduced mouth opening and post on co surgery completely edentulous patients, which pose a great amount of difficulties and challenges during the impression making. This article presents few case reports of few commonly encountered but difficult edentulous situations and the variation in impression procedures in such cases.

Keywords: impression, resorption, flabby, microstomia, maxillectomy

Introduction

The performance of a complete denture is often a reflection of its support and retention [1]. The journey towards successful denture fabrication for such patients begins with an accurate impression that will help to ensure that the complete denture is stable, that provides physiological comfort to the patient. A master impression for a complete denture should 'record the entire functional denture-bearing area to ensure maximum support, retention and stability for the denture during use' [2]. However difficulties arise due to sum existing clinical situations which makes impression making a taxing job. A particular problem is encountered if a flabby ridge is present within an otherwise 'normal' denture bearing area. If the flabby tissue is compressed during conventional impression making, it will later tend to recoil and dislodge the resulting overlying denture [3, 4]. Clearly, an impression technique is required which will compress the non-flabby tissues to obtain optimal support, and, at the same time, will not displace the flabby tissues. Similarly a highly resorbed residual mandibular ridge which is commonly observed in older patients, along with thin, atrophic mucosa and lower threshold of pain, with diminished resiliency of tissues and muscle tonicity accompanied by poor adaptive capacity. Providing a stable lower denture for such patients has been a more difficult problem encountered by dentist. Thirdly the provision of a satisfactory denture in case of reduced stomal inlet has always been a trouble for the patient and a challenge to the prosthodontist [5]. Fabrication of complete and removable partial denture prosthesis requires accurate diagnostic impression and diagnostic casts for the development of custom trays and final impression. The decreased mouth opening, technically called "Microstomia," poses problems in tray selection, impression making, jaw records and denture

insertion. Another clinical situation where impression making becomes critical in post onco-surgical cases where partial maxillectomy has been done and where some form of oronasal opening remains [6]. In this article three case reports are mentioned where the routinely done secondary impression methods are modified and customized according to the presenting situations.

Case 1: Completely edentulous patient with flabby tissue in anterior maxilla and grossly resorbed mandibular ridge

A 64 years old male patient reported to the department of Dentistry Vardhman Institute of Medical Sciences, Pawapuri, Nalanda, Bihar with a chief complaint of loose upper and lower dentures and also complained of repeatedly failing complete denture treatment for the past 5 years. On examination it was found that there was flabby and mobile tissue in anterior maxillary region with an otherwise healthy and well-formed maxillary ridge. The mandibular ridge showed marked resorption (At woods class VI). Previous dentures were examined and they showed poor retention and stability. It was decided to fabricate a new pair of dentures using the window technique of secondary impression making for the maxillary arch. The patient was explained about the treatment procedure. Here a window was cut in the special tray corresponding to the flabby tissue region. The rest of the impression was made in zinc oxide eugenol after border moulding, but the flabby area was recorded in a minimum pressure state with light viscosity elastomeric impression material over the window region which did not compress the mobile tissue.

As the mandibular residual alveolar ridge was resorbed and the sulcus depth was shallow, a good preliminary impression with impression compound was difficult to achieve. To

overcome this problem a three step impression making was planned.

- a) In the first step, alginate impressions of maxillary and mandibular arches were made using stock trays. The impressions were poured in dental plaster. Over this cast a double thickness full spacer (to provide space for impression material) and a custom tray was fabricated.
- b) The custom tray was trimmed checked in patients mouth and then a preliminary impression was made using admix material (a mix of impression compound and greenstick compound in the ratio of 3:7). Impressions were poured in dental plaster and a special tray was fabricated with a full spacer.
- c) The special tray was trimmed and checked in the patient's mouth and then the border moulded with green stick and final impressions were made in zinc oxide eugenol impression paste.



Fig 1: Flabby anterior maxillary region



Fig 2: Resorbed mandibular ridge



Fig 3: Window technique for maxillary arch and maccords technique for mandibular arch

Case 2: Completely edentulous maxillary arch and reduced mouth opening

An 18 year old female patient reported to the Department of Dentistry Vardhman Institute of Medical Sciences, Pawapuri, Nalanda, Bihar with a chief complaint of missing upper teeth. On examination it was found to be a completely edentulous maxillary arch and another important finding was a markedly reduced oral opening. It was decided to fabricate a sectional complete denture for the edentulous maxilla. The preliminary impression was made in a sectioned stock tray. For the border moulding and secondary impression, a customised sectional tray was fabricated with screws fitted and a special locking mechanism so that the sectional border moulding and the sectional wash impression could be reassembled outside the mouth.



Fig 4: Secondary impression of maxillary arch



Fig 5: Secondary impression of maxilla

Case 3: Completely edentulous arches following partial maxillectomy with a posterior maxillary defect.

A 50 year old female patient, reported to the Department of Dentistry with a chief complaint of unpleasant appearance due to loss of all teeth following a surgical removal of a portion of her maxilla. Her history revealed a partial maxillectomy done in the right maxilla 4 years back. Her tissues showed good healing and a small hard palate defect remained which was asymptomatic. It was decided to give a complete denture prosthesis to the patient with a special acrylic extension to shut the defect area. After making initial impression with irreversible hydrocolloid in a stock tray, a full thickness spacer was adapted on the cast and acrylic special tray was prepared. A small acrylic extension was made in the defect area to retain the recording material. Border moulding was done with putty addition silicone. Putty was added on the extension loop and the defect was recorded. A final wash impression was made with light bodied addition silicone.

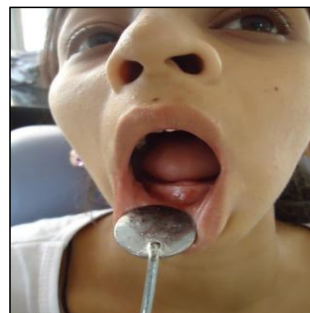


Fig 6: Reduced mouth opening



Fig 7: Sectional border moulding



Fig 8: Sectional secondary impression



Fig 9: Assembling of the impression



Fig 10: Completely edentulous maxillary arch with partial maxillectomy



Fig 11: Intra oral defect in left posterior maxillary segment



Fig 12: Defect blocked with putty addition silicone in a special tray



Fig 13: Wash impression with a light bodied addition silicone

Discussion

A multitude of impression techniques have been described for overcoming the problem of the flabby ridge. Liddlelow^[7] described a technique whereby two separate impression materials are used in a custom tray (using 'plaster of Paris' over the flabby tissues, and zinc oxide and eugenol over the 'normal' tissues). Osborne^[8] described a technique whereby two separate impression trays and materials are used to separately record the 'flabby' and 'normal' tissues, and then related intra-orally. Watson^[9] described the 'window' impression technique where a custom tray is made with a window or opening over the (usually anterior) flabby tissues. A mucocompressive impression is first made of the normal tissues using the custom tray and zinc oxide and eugenol. Once set, it is removed, trimmed, and re-seated in the mouth. A low viscosity mix of 'plaster of Paris' is then painted onto the flabby tissues through the window. Once set, the entire impression is removed. In this case report Watson's window technique was followed only a slight variation was the use of light bodied elastomeric impression material instead of impression plaster because of the easy handling and manipulation of light viscosity elastomer over plaster.

In the atrophic mandible, one of the principal functional problems, other than instability, arises from the inability of the residual ridge and its overlying tissues to withstand masticatory forces^[10]. Furthermore, the muscle attachments are located near the crest of the ridge, with greater dislocating effect of the muscles. For these reasons, the range of muscle action, as well as spaces into which the denture can be extended without dislocation, must be accurately recorded in the impression. Modern approaches often involve dental implant therapy as a means of improving the denture foundation and supplementing the mechanics of prosthesis support, retention and stability. Regardless of implant availability, physiologically optimal denture contours and physiologically appropriate denture tooth arrangement should be achieved to maximize prosthesis stability, comfort and

function for patients. This article tries to present a novel method to achieve the above mentioned denture qualities by simple usage of materials available by the chair side with every dental clinician. The Anthropoidal pouch technique¹¹ which is a three step impression making procedure was followed.

Making impressions in microstomia patients is often cumbersome. A modification of standard impression procedure is often necessary while treating such patients. Cases of limited mouth opening are often discussed in prosthodontics. Microstomia may be the sequelae of orofacial burns, carcinoma, cleft lip, trauma, scleroderma, Plummer Vinson's syndrome, genetic disorders, surgery, or natural ageing processes^[12-14].

Several stock and custom tray designs have been described in literature. Sectional impression trays have been fabricated using recesses, orthodontic screws, go blocks (Lego systems Inc., Enfield, CT), dowel plug holes and a screw joint for rigid connection, locking levers, and interlocking tray segments. Flexible impression tray with silicone putty has been also used in making impression in a microstomia patient. The locking mechanism used in this article is simple and the small size of the arch also allowed using of just two screws and an acrylic lock for reassembling the impression.

Lastly obturation of an intra-oral defect along with a complete denture prosthesis poses the maximum difficulty during the impression making step because the blocking of the undercut in the defect area is crucial as well as the accurate recording of the resected area is required to get a satisfactory peripheral seal. Putty was used to record the defect area because of its elastic nature. Light bodied elastomeric impression material was chosen for wash impression because of its favourable properties over zinc oxide eugenol impression material. Some lab work and technical support was taken from outside private clinic and the work was self-funded.

Conclusion

Advances in health care have resulted in a number of long term denture wearers. Highly resorbed residual mandibular ridge or flabby tissue in the edentulous area is commonly observed in older patients, along with thin, atrophic mucosa and lower threshold of pain, with diminished resiliency of tissues and muscle tonicity accompanied by poor adaptive capacity. Similar difficulties arise when there is reduced oral opening due to different congenital or acquired factors. Impression making also becomes arduous and challenging in partially resected jaws with intra oral defects. But these are not uncommon findings and they have to be tackled in day to day clinical practice. The aim of this article was to describe the simplified management of these compromised edentulous situations which can be accomplished by expanding on the basic principles of complete denture construction without recourse to surgically invasive procedures.

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