



ONE FOR ALL , 4 FROM 1 ! – AN INNOVATION IN MAKING DENTULOUS IMPRESSIONS WITH ADJUSTABLE TRAYS

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Abstract:

Aim: It aims to provide an easy and efficient method of recording dentulous impressions by adjusting a single tray for various mouth sizes.

Settings and Design/Methods and Material: Sectioning the maxillary and mandibular tray each in three parts and attaching 3 screws (regular stainless-steel wood screws were used) in the upper and 2 screws in the lower tray was done. A demonstration model for the same has been constructed with nickel-titanium screws. The objective of writing the article is to propose the idea and demonstrate the functioning of the tray.

Results: The trays were sectioned, screwing and unscrewing was done (with-Taparia flat tip mini head screw driver - 10.0 x 1.2 mm) and change in tray size from number 1 to 4 and vice-versa was observed. Matrix bands were placed on the sides to provide stability to the tray and to prevent movement of the sectioned parts while in use.

Conclusion: The expandable tray is an easy and effective method of recording impressions. It can be easily modified according to the clinical scenario saving on valuable clinical time and effort.

Keywords: expandable tray, dentulous tray, impression making, modified perforated tray, adjustable tray

Introduction:

Impression making is an art. Various materials and methods have been used in order to obtain an accurate impression with maximum reproduction of details of both the hard and soft tissues involved. The choice of the impression material used depends on the purpose of impression making (Primary or Secondary), the tray used, operator's preference etc. Alginate is the most commonly used impression material; it is economical, simple and an indispensable part of clinical dental practice.

Following selection of impression material, it is essential to select the correct impression tray. Though custom-made impression trays minimize distortion and material wastage, clinicians prefer using stock trays owing to time constraints and to reduce patient chairside time [1]. Tray rigidity is an important parameter in FPD impressions because even slight flexing of tray causes distortion of the impression [2]. Stock trays used in dental practice may be metallic (aluminium or stainless steel) or non-metallic (plastic). The most commonly used stock trays are stainless steel due to their rigidity, ease of availability and economical concerns. In a study conducted in Azeezia college, Kerala on 'A comparative evaluation of plastic and metal impression trays on the accuracy of cast', concluded that metal impression trays were more accurate in making

impressions but the data was statistically comparable with plastic stock trays.

Usually four sizes of impression trays are available. The most common mouth sizes observed in Asian population being upper and lower 2 or 3. The stock trays would sometimes require customization in the form of tray modification. Modifications can be done with wax, tracing stick impression compound, or heavy-bodied silicone, depending on the operator's convenience. Stick compound is preferable as wax is nonrigid. Impression trays and their modifications should be rigid [3].

Another way of making modification without the addition of a secondary material is demonstrated here. It helps us expand the tray depending on the ridge extension of the patient thereby allowing us to use a single tray in patient with ridge size corresponding to tray number 1 or 4.

The impression material used in our research model is alginate. Elastomeric impression materials may also be used with the trays.

Materials and Methods:

To achieve the goal of this experiment, the following steps were performed -

1. Maxillary and Mandibular stainless-steel dentulous metal trays of size 1 were selected and sectioned as seen in figure (fig.1 and 3)

2. Screws were attached to the three parts of the tray to make it a functional model (3 in upper and 2 in lower) (fig.1 and 3)

3. The horizontal screw in the upper tray is a freely movable screw that adjusts according to the opening and closing of the lateral screws.

4. Matrix bands have been attached to both the sides of the tray for support.

5. The two lateral screws can be opened and tray size can be adjusted according to the arch size of the patient. (fig.2 and 4)

6. In this way, a single tray can be used to obtain an impression from patients with different arch size.

Results:

The functional model thus constructed fulfilled all objectives and was presented at the 22nd IPS convention, Kerala. Further, replacement of screws with biocompatible advancing screws soldered on the tray would be done considering the advantages of the 'one for all' system.

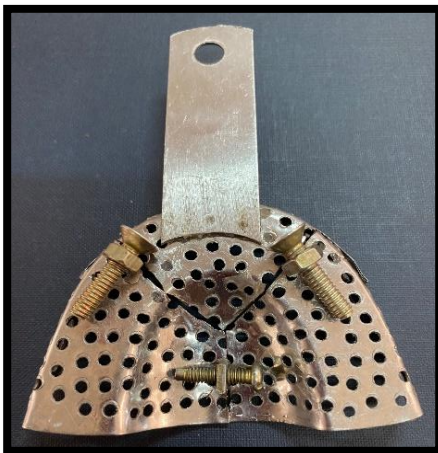


Figure 1: U1 tray with 2 lateral and 1 horizontal screw

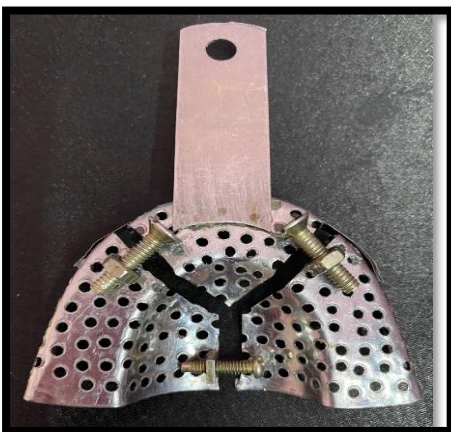


Figure 2: U1 tray expanded by unscrewing the screws



Figure 3: L1 tray with 2 lateral screws



Figure 4: L1 expanded by unscrewing lateral screws

Discussion:

Making a good impression is the key to a good prosthesis. Being the first step in the fabrication of a prosthesis, it is generally overlooked but an accurate impression is extremely essential.

Stock perforated metal trays are most commonly used for making primary impressions for RPD/CPD with alginate or with elastomeric impression materials for FPD/Implants. The rigid nonperforated stock trays, both plastic and metal, could be an alternative for custom trays for multi-implant impressions when used with medium viscosity impression materials [4].

Custom trays used in dentistry are attributed to be more accurate as they are customised specifically for the patient. A number of studies have been done to identify the pros and cons of using a stock or custom impression tray. A study conducted by Millestein et al concluded that impressions made from custom trays were more accurate and consistent in reproduction than were stock tray impressions [5].

In today's era, digital impressions are emerging rapidly on the high-tech horizon. They promise to eliminate all inaccuracies, are faster, less messier than the conventional

methods but proper soft tissue management and isolation of tooth preparation is still necessary. The relative cost of digital impressions to conventional elastomer impressions is very high but a dentist must use a digital impression system for a significant amount of time to compensate for the cost of the device [6].

Among all, the conventional metal stock trays are the most widely used trays in daily clinical practice due to economic reasons as well as ease of use and availability and hence were chosen in our research model.

Some of the drawbacks of this system may include time taken in adjusting the size and difficulty encountered while cleaning the impression tray. Both these drawbacks can be minimized by knowing the technique well and practice. The tray can be sterilised in an autoclave similar to other stainless-steel trays.

The research mainly focuses on the importance of making good impressions by adjusting the tray to accommodate different mouth sizes. This not only helps in making

accurate impressions but also eases the process and allows us to work faster.

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