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A NOVEL SIMPLIFIED IMPRESSION TECHNIQUE FOR FABRICATION OF DISTAL EXTENSION ACRYLIC PARTIAL DENTURES

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Abstract

Acrylic partial dentures are still the first line of treatment for the partially edentulous in many countries. Though there are many physiologic and functional techniques recommended to record the supporting form of edentulous distal extension areas, they may not be used in practice because of being cumbersome. Simplified impression techniques may increase the confidence of beginners in the treatment concept of acrylic partial dentures. A novel, simplified and economical impression technique that adheres to principles of RPD impression making is presented. A single tray was used to record the dentulous and edentulous area in a single step by using two impression materials.

Key Words: Acrylic Partial Denture, Distal Extension, Simplified Impressions, Single Tray

Introduction

Despite their frequent use and popularity, the proper technique of Acrylic partial denture (APD) fabrication is not found in textbooks or manuals, and prosthodontists maintain a regretful attitude towards their use in spite of their proven benefits. The advent of Removable partial dentures (RPD) may have preceded complete dentures in India. The popularity of (APD) can be traced back to the latter half of the twentieth century[1].

India is a country of more than 1.3 billion people with different socioeconomic demographics. A study conducted in Northern India revealed that between the ages of 43 and 53, 41.9% of females from rural areas and 48.2% urban females were partial edentulous while 58% of rural males and 51.7% urban males respectively were partially edentulous.[2] Acknowledging the financial constraints that individuals face, the acrylic partial dentures have been an economical and viable alternative to cast partial dentures in other countries too[3, 4].

Christensen stated that the RPD impression techniques taught in dental schools are too time consuming and not suitable for routine use in prac-

tice. He further suggested that Dental curriculum should include simple and dependable methods so that the novice doesn't lose faith in RPD[5].

In this paper we describe a novel, easy to follow and economical technique of recording an impression for a case requiring maxillary and mandibular distal extension APDs.

Technique:

A 56-year-old female patient was referred to the Department of Prosthodontics, for replacement of missing teeth. On clinical examination it was found that the patient had several missing teeth in both the arches (Kennedy class 2 situation in both maxillary and mandibular arches) (Fig.1). The teeth present were 11, 12, 13, 14, 21, 22, 23, 24 in the maxillary arch and 31, 32, 33, 34, 41, 42, 43, 44 in the mandibular arch. Grade I mobility was observed with 11, 21, 22 and 31, 32, 41 after completion of periodontal therapy. Various possible fixed and removable treatment options were given to the patient, but due to monetary reasons patient opted for acrylic removable partial dentures.

Fig. 1: Intraoral view

1. Primary impression of maxillary and mandibular arches was recorded with alginate impression material. Primary casts were obtained using Type 3 gypsum (Fig.2).

Fig. 2: Primary casts

2. On these primary casts, a 4mm (2 wax sheets) wax spacer was adapted on the dentulous area extending 2mm beyond the gingival margins of teeth labially and lingually. A 2mm wax spacer (1 wax sheet) was also adapted on the edentulous areas except in post palatal seal region and kept 2mm short of the peripheral sulcus (Fig.3). Provision for tissue stops was made in both dentulous and edentulous regions.

Fig. 3: Spacer design with tooth and tissue stops

3. Custom trays were fabricated with self-cure poly methyl methacrylate (PMMA) that extended only 2mm beyond the gingival margins of teeth on the labial sides (Fig.4). The trays were trimmed 2mm short of periphery in the edentulous areas except in post palatal seal area.

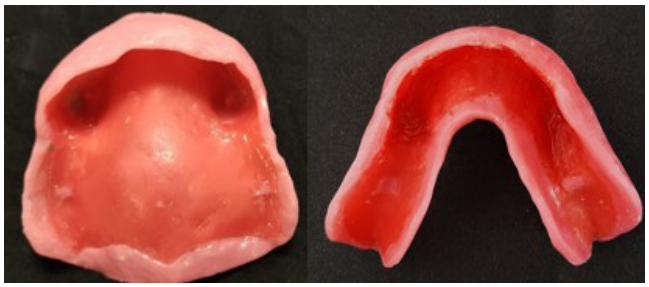

Fig. 4: Special tray

4. Border molding was done in edentulous regions alone for both arches using low fusing green stick.

5. Spacer was removed and multiple holes (3 to 4mm diameter) were made all over in the area of the tray covering the teeth. Palatal relief holes (2mm diameter) were also made (Fig.5).

Fig. 5: Border molding carried out with low fusing compound; Wax spacer removed; vent holes made followed by application of tray adhesive

6. Tray positioning inside the patient's mouth was practiced using the edentulous area as guide. Application of an adhesive in the dentulous area of tray is optional.

7. Zinc oxide eugenol impression paste was mixed first. Since alginate impression material has a shorter working time, its mixing was delayed till the mixing of impression paste was almost completed. The impression paste was loaded first in the edentulous area of tray followed by alginate impression material in the dentulous section.

8. The tray is placed in the mouth as practiced before and removed when both materials have set (Fig.6).

Fig. 6: Final impression made with dual material

Discussion

With the advances in dentistry, various definitive impression techniques (physiologic/ functional) and impression materials have been used to fulfill the objectives of impression making.[6] However, as most of the impression techniques are tedious, a single impression made with elastomeric materials has been proposed by many. [7, 8] One of the well-established functional impression material is Zinc-oxide eugenol impression paste[9]. Hence a simplified technique using economical materials like zinc oxide eugenol impression paste and alginate would benefit the dental fraternity in making efficient acrylic partial dentures, especially in the more demanding Kennedy's class I and class II partially edentulous arches. This is particularly true for developing nations where acrylic partial dentures are mainstay. Hence, an innovative and simplified approach using cost-effective materials in a single custom tray was adopted to overcome the difficulties associated with two tray approach which may be commonly followed in Asian developing countries.[10]

The single tray method can save clinical time without compromising the objectives of impression making. Clinical studies may be conducted to compare the efficiency of the novel single tray impression versus the conventionally followed two tray technique. Simplified, efficient

and economical impression techniques should become a part of the teaching curriculum.

The advantages of the current technique are:-

1. As a single tray was used to record the impression of both dentulous and edentulous areas in a single step, there are less chances of inaccuracy in the impression which is a possibility with Hindle's technique (2 tray technique). The inaccuracy can happen in a two tray technique, when the outer stock tray fails to accurately orient to the inner custom tray during impression removal.
2. There is no possibility of double borders in the edentulous section of the impression, which is commonly seen with two tray technique.
3. Very often, partially edentulous patients present with periodontally compromised teeth with wide embrasures due to which impression making with elastomers (medium viscosity/ monophase) can be uncomfortable for the patient. The material becomes rigid on setting and is often difficult to retrieve when embrasures are not blocked. In such situations using alginate in the dentulous area would be an advantage.
4. One of the major advantages of alginate impression material over elastomers is its hydrophilic nature which helps in better wetting and easy recoding of the tissue details.

Conclusion

In conclusion, the innovative impression technique discussed in this article marks a significant advancement in the field of prosthodontics, particularly for the fabrication of distal extension acrylic partial dentures. This novel approach offers numerous advantages, such as improved accuracy, enhanced patient comfort, and streamlined clinical workflow. By simplifying the traditionally intricate process of capturing accurate impressions in distal extension cases, this technique not only reduces the potential for errors but also minimizes patient discomfort, ultimately leading to higher patient satisfaction.

Moreover, the simplified impression technique outlined in this article holds great promise for the broader dental community. It has the potential to save both time and resources while maintaining high-quality results, making it an attractive option for dental practitioners seeking to optimize their clinical practice.

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