



A comparison between two methods for gingival retraction (traditional and observational) on the marginal accuracy of the final models

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ABSTRACT

This study aims at comparing the appearance of the finish line using the observational method, and a new method in taking the impression and displacement of the gingival tissue without the gingival cord. In this research, Twenty one (21) patients were chosen. Who did not suffer from any supportive tissue diseases (such as inflammation or gingival bleeding). The patients needed crowns for their molars. Three impressions were taken from each patient, and the total number of impressions was 63. After preparation, the first impression was handled with the traditional method (putty – wash) without the gingival retraction. The second impression was handled with the observational method. All the final impressions were filled by Acryl, either completely or only for the prepared tooth area. After that, the bases were filled with gypsum. Cochran and McNemar test were used to study the differences among the two groups' averages. Results have shown that there are statistical differences between the first and second group. It was concluded that the Traditional Method is better than the other one. Although the observational method is good, the traditional one is much better.

INTRUDUCTION

An impression is an imprint or negative likeness of the hard tissues of teeth, and the soft tissues surrounding structures. It is used for performing restorative or prosthetic tasks in the laboratory [1]. Before forming the impression, and determinate the exact prepared tooth, the gingival tissues located around teeth should be observed carefully.

The most important consideration need to be taken care of is gingival displacement. Gingival displacement is a crucial task for achieving a good mold from the finish line. This is workable by either operation, or mechanically [2]. A suitable mold for cast restoration should have the following features:

1. It should be an exact duplication of the prepared tooth, including all of the preparation and enough uncut tooth surface beyond the preparation to allow the dentist and technician to be certain of the location and configuration of the finish line.
2. Other teeth and tissue adjacent to the prepared tooth must be accurately reproduced to permit proper articulation of the cast and contouring of the restoration.
3. It must be free of bubbles, especially in the area of the finish line and occlusal surfaces of the other teeth in the arch.

MATERIALS AND METHODS

- 21 patients with the following features were chosen :
- They all needed preparations for their first or second Molar teeth in the maxilla or mandible
- They had no systemic disease
- Their ages were among 25-50
- There was no decay and sub gingival restoration in their molars
- They didn't have gingival and PDL inflammation
- Polyvinyl Syloxan Material (Zhermack 45021 BDIA Polesine[Rovigo]Italy)
- Ging Retraction Cord (GINGI-PAK Z-TWIST 00 USABellport)
- The cold Acrylic resin substance Self-cured (vertex-dental bvJ.v.oldenbarnevelth 62 3705HJZeist The Netherland)
- Plastic Trays
- Chamfer and pearl-like bur(Hager&Meisinger GmbH P.O.B.210 355 D-41 429 NEUSS)

Criteria of Patient Selection

Good oral hygiene (based on Selence Value) [3].All patients should need an only crown.

The Study Method

21 patients who needed a sole crown were chosen. The initial impression was taken from them all, after word, the chamfer tooth preparation began. The amount of preparation was as follows: Buccal side 1.2 millimeters and the other side layers 0.7 millimeter, functional cusp 1.5 millimeters and nonfunctional cusp 1 millimeter. In order for the measurements in all the impressions to be the same four grooves (0.5 millimeter each) were made in the four walls (sides) of each tooth.

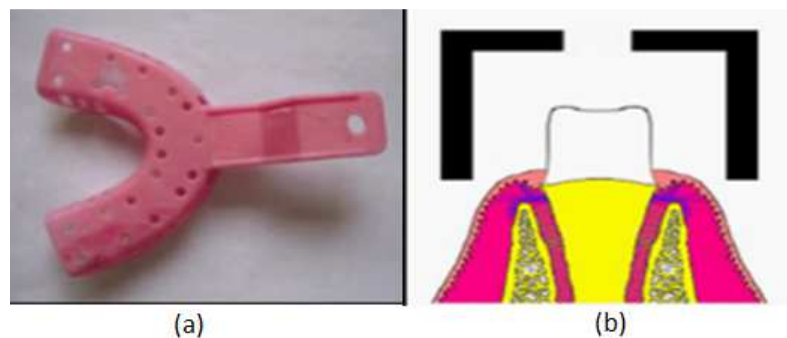


Fig. 1:A hole was produced on the Tray (two-third the whole surface of the prepared tooth)

Two impressions, from two different methods were taken from each patient. The first method, patient control, was without the retraction cord or any mechanical means. The second method, named "Traditional method" was by using the retraction cord with adrenalin, a common and accepted way.



Fig.2: The extra amount of putty was then placed on the hole, and pressed it with a finger so that with a little bit of mechanical pressure, the gingival was displaced

The impressions were then taken constantly and with an interval of 15 minutes. The chronological interval was implemented because of the returning of the gingiva to the initial place. However, according to the research done by Laufer BZ, et al, after using the retraction cord, the gingival will return to its initial place in less than 30seconds [4].

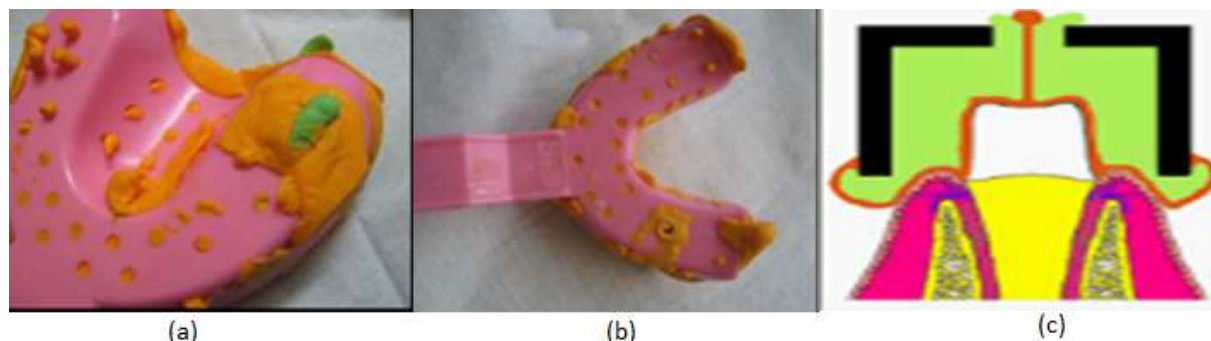


Fig.3: A hole with a diameter of 2 millimeters in the Putty material on the prepared tooth was produced in order for the wash to be easily expelled.

Three impressions were then formed with the same tray size and Additional Polyvinyl Syloxan. The impressions were formed in two steps (Putty-Wash) and without any space.

RESULTS

All the impressions were analyzed in four levels and with the Cochran's method (Mesial, Distal, Buccal and Lingual). For the successful variables, number 1, and for the unsuccessful ones number 0 was chosen. Depth or width less than 100 microns was counted as the unsuccessful conditions:

- The MCNemar method was used to distinguish the difference among the two methods. In this statistical method, both methods were compared with each other.
- Graph number 1 shows the relation between the percentage of success and unsuccessfulness of the two methods in 4 levels and 8 points.
- Graph number 3 indicates the difference between the two methods with the P-value system.
- Methods' Discussion:

Method discussion

The chemical-mechanical method is used a lot in clinics e.g., (using the retraction cord immersed in epinephrine HCL or e.g.). This method is a more active and safer one than the operation way [5]. However, using the retraction cord has its own disadvantages such as: A; it is more consuming B; more effort is required on the dentist and patient's side C; at times, there may be bleeding and pain, especially when no anesthetic is used d .and when used improperly, it may cause injury to the gingiva and recession after a while [6-7-8-9].

Since the traditional methods were time-consuming and/or led to gingival injuries, we decided to think of a new method excluding the two disadvantages.

In both methods, the depth and width of the gingival groove were measured on the micron scale. Because this method has never been assessed, we have to explain the different ways of gingival displacement [5-9] and with different researches on the influence of different methods on displacement the gingival to sides [11-12] and describing the gingival displacement without the cord and its advantages related to the time we take the impressions [13-14] and probably the effect of the kind of material used for impression production on the degree of displacement gingival, e.g. [15].

As the distinguishing power of the human eye is 0.1 millimeter or 100 microns, the limit for gingival displacement is 100 microns, both in depth and width of the mold. Fewer than 100 microns is counted as unsuccessful and it indicates the unacceptability for laboratory work. With this feature, the two impressions were compared with each other:

The Observation Method (patient control) in which the impressions are formed without retraction cords or any other helping device. And finally, the conventional method in which gingival displacement is achieved through the retraction cord immersed in adrenalin.

DISCUSSION

After observing the final percentages of the study, it was concluded that:

The best method for gingival displacement while producing the impressions is using the retraction cord immersed in adrenalin. Definitely, it was considered that the observation method (patient control) was not successful, and that we cannot use it for gingival displacement in the impression – formation process. In addition, in this method, the finish line will not be visible.

Based on the statistical assessments, which were derived from a comparison of the results taken from Mesial , Distal, Buccal and Lingual levels in both directions; (depth and width) the statistical differences below were achieved

CONCLUSION

Having compared the observation method (patient control) and the traditional method, it was seen that the common traditional method was clearer than the observation method (patient control). Observing the results of the two methods “New” and “Traditional” there was no significant statistical difference observable. Having observed all the statistical and clinical methods, it was concluded that the traditional method has the best results.

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