A Comparison between two Methods for Gingival Retraction (Observational and Dr. Amid’s Technique) on The Marginal Accuracy of the Final Models

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ABSTRACT:

Background and Objective: 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.

Materials and Methods: 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 observational method without the gingival retraction. The second impression was handled with the hollow tray based on the new method (Dr. Amid’s Technique).

Results: 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. Results showed that there are statistical differences between the first and second group.

Conclusion: It is concluded that the two methods doesn’t have significant differences. The new method is good and better than the observational.

Keywords: Comparison, gingival Retraction, Observational, Dr. Amid’s Technique, Marginal Accuracy

[1] INTRODUCTION

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 determine 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.

[II] 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

1- Polyvinyl Syloxan Material (Zhermack 45021 BDIA Polesine[Rovigo]Italy)
2- Ging Retraction Cord ( GINGI-PAK Z-TWIST 00 USABellport)
3- The cold Acrylic rezin substance Self-cured (vertex-dental bvJ.v.oldenbarnevelth 62 3705HZZeist The Netherland)
4- Plastic Trays
5- Chamfer and pearl-like bur(Hager&Meisinger GmbH P.O.B.210 355 D-41 429 NEUSS)

Criteria of Patient Selection:
1- 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.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, Dr. AMID's Technique, was also without the retraction cord, but this time with a hole two-third the Occlusal surface of the prepared tooth so that the Putty substances would cause the gingival to be 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 30 seconds(4). Two 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.

The New (Dr. Amid's) Method:
After Preparation Finalization:
1- The suitable Tray for the jaw was chosen.
2- The Tray was marked on a spot two-third the occlusal surface of the prepared tooth.
3- A hole was produced on the Tray (two-third the whole surface of the prepared tooth) Fig.1-2.

Fig.1

Fig.2
4- After mixing the putty, a little amount of it was taken, and located it on the prepared tooth afterword the tooth was pushed on the top surface.

5- A little amount of the substance was saved.

6- The rest of the substance was then located in the Tray, and the Tray was located in the suitable place in the mouth. 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 Fig.3.

7- Pressing was continued till the putty reached a medium toughness in order to decrease stress to minimum.

8- After the final toughening, the tray was removed from mouth. Afterwords, the undercut areas in the putty were removed. Then two grooves were produced on the putty around the preparation tooth’s area before the finish line. This was done in order for the redundant material of the wash to be sent out.

9- 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 Fig.4-5-6.

After getting the impressions, they were filled with the Acrylic Self-Polymerized substance of Vertex (vertex-dental bvJ.v.olderbarnevelth 62 3705HZZeist The Netherland) Fig. 7.

Then divided the prepared tooth from the center of the Mesial to the distal groove and from the center of the Buccal to the Lingual and into four parts, based on the grooves which were on the tooth Fig. 8.
Photos were then taken using digital cameras connected to a light microscope (NovexHoland) which magnified the capture by 4x. The depth and width of the gingival groove was measured by the software Motic plus v.2 on the Micron scale Fig.9-10-11-12-13.

[III] 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 new method which causes the gingival to displace by the pressure of the Putty substances is good. Definitively, 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. Graph number 1 shows the relation between the percentage of success and unsuccessfulness of the two methods. Graph 2 shows the Cochran system for the immaterial studying of the three impressions in 4 levels and 8 points. Graph number 3 indicates the difference between the two methods with the P-value system. 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 three 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. The New Method (Dr. Amid's Method) were the Putty's pressing force for gingival displacement is applied. And finally, the conventional method in which gingival displacement is achieved through the retraction cord immersed in adrenalin.

[IV] 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. After that is the new method which causes the gingival to displace by the pressure of the Putty substances. Definitively, 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.

[V] CONCLUSION
In a comparison between the observation method (patient control) and the new method (Dr. Amid's), the new method showed the finish line better and in a more distinguishable way and the gingival displacement was more than the observation method (patient control).

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