

## CLINICAL AND TECHNOLOGICAL PARTICULARITIES REGARDING UNIDENTAL RESTORATION USING CERAMIC CROWNS WITH A ZIRCONIA INFRASTRUCTURE. A CASE REPORT.

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### ABSTRACT

For a predictable result the clinician should master both the clinical and the technological dimenssions in such a way that the two components will be synergetic in the benefit of the patient. A 38 years old female patient came to our clinic accusing pain at the level of tooth 2.2. Clinically we could see that the tooth was cover by a PFM crown which as incorectly adapted at the cervical level. The patient said that during the last years she had many crowns replaced at the level of the same tooth but the discomfort still persisted. Although the technological procedure of manufacturing a zirconia based ceramic crown is much demanding than the one for the PFM crown, in anterior unidental complex restorations, it is highly indicated because it will provide superior periodontal stability.

### Introduction

Anterior fixed restorations associated with periodontal and endodontic complications are one of the most challenging dental treatments due to the high degree of complexity and interdisciplinary approach. [1]

For a predictable result the clinician should master both the clinical and the technological dimenssions in such a way that the two components will be synergetic in the benefit of the patient.[2,3]

### Case report

A 38 years old female patient came to our clinic accusing pain at the level of tooth 2.2. Clinically we could see that the tooth was cover by a PFM crown which as incorectly adapted at the cervical level. The patient said that during the last years she had many crowns replaced at the level of the same tooth but the discomfort still persisted.

We have ordered a digital OPG and a periapical x-ray in order to see what is the endodontic and periodontal status of that tooth. (Fig. 1A-B)



Fig. 1A - Initial OPG

After the x-rays we could have noticed that tooth 2.2 has an incorrect endodontic



Fig. 1B- Periapical x-ray

treatment associated with the placement of a metallic post.

The treatment plan included [2]:

- the ablation of the PFM crown
- removal of the metallic post
- endodontic retreatment
- placement of provisional acrylic crown
- placement of a zirconia based ceramic crown

The ablation of the PFM crown was successfully done and afterward we removed



Fig. 2A During the re-treatment

as well the metallic post. The endodontic space was retreated using the rotary preparation technique and a fit radiological test with the master guttapercha point was done. (Fig. 2A) Afterwards the tooth was correctly retreated from the endodontic point of view and we have achieved a very good outcome. (Fig. 2B)



Fig. 2B After the re-treatment

After the endodontic treatment the geometry of the abutment was reconstructed using a heavy flow composite (GrandioSO -Voco) and

we have corrected the clearance and axis throughout additional preparation. (Fig. 3)



Fig. 3 Abutment after reconstruction

### Results and discussion.

An impression was recorded and we have ordered in the dental laboratory a provisional acrylic crown shade A1. Although we have advised the patient that VITA shade A1 is too light in comparison with the adjacent teeth, she insisted to have it in this shade. After we have

received the crown from the dental laboratory the patient noticed that the provisional crown's shade is too light and it doesn't disimulate nicely among the other teeth. So she understood that for final restoration we have to choose a darker shade. (Fig. 4A-B)



Fig. 4A Provisional Acrylic Crown (frontal view)



Fig. 4B – Provisional Acrylic Crown (lateral view)

The provisional acrylic crown was fixed with temporary cement that allows the easy removal of the crown whenever needed for doing the clinical tests necessary for the final restoration. [3]

After ten days the patient was invited back to the clinic for recording the impression for the zirconia based ceramic crown. We used the

double cord eviction technique and a silicone with addition reaction.

The impression was disinfected and sent it to the dental laboratory. After they have fabricated the zirconia base the sent the working model back to the dental clinic for clinical fit test. (Fig. 18A-D)



Fig. 5A Abutment prepared for the impression



Fig. 5B Zirconia structure



Fig. 5C Silicone fit test



Fig. 18D –Zirconia clinical fit test

The working cast was poured out of class IV plaster and the technicians used the removable dye technique for more accuracy. The model was scanned and the zirconia base

was fabricated with the CAD-CAM device. (Fig. 6A-B)



Fig. 6A Working cast with removable dye

We have noticed that clinically we have less occlusal clearance than on the working cast that's why we registered a new occlusal silicone key that we sent back to the lab in

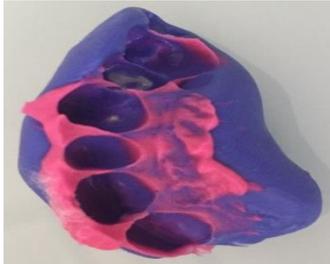


Fig. 7. Occlusal silicone key

In the same time we placed some fluid silicone inside the zirconia structure for the technicians to reevaluate the contact areas



Fig. 9 Dentine fit test

The dentine clinical fit test was excellent and no adjustments were necessary. The crown was sent to the dental laboratory for the final glaze. (Fig. 9)

The final result was outstanding putting



Fig. 6B – Zirconia structure

order for the technicians to readjust theocclusal relationship. (Fig. 7)



Fig. 8 - Fluid silicone test inside the zirconia structure

between it and the abutment and make the necessary adjustments. (Fig.8)



Fig. 10A Final result

into evidence a very nice cervical adaptation of the zirconia based ceramic crown and in the same time an excellent aesthetic outcome. (Fig. 10 A-D)



Fig. 10B Cervical adaptation



Fig. 10C – Final result at recall



Fig. 10D – Final result at recall

Although what we have exposed several important advantages during this case report The PFM crowns still remain the most frequently used crown in the posterior area

#### Conclusions

The zirconia based ceramic crowns offer a better aesthetic outcome than the PFM crowns especially in the anterior area, when periodontal and endodontic complication are present.

The interaction between the zirconia base and the marginal gingiva is minimal and usually we see no signs of inflammation compared to the PFM crowns where the

due to its multiple advantages and relatively low cost price compared to the zirconia based crown. [6]

metallic infrastructure can induce inflammation and coloration of the marginal gingiva.

Although the technological procedure of manufacturing a zirconia based ceramic crown is much demanding than the one for the PFM crown, in anterior unidental complex restorations, it is highly indicated because it will provide superior periodontal stability

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