



Fig. 17: Silver dies left hand side view



Fig. 18: Copings and implant abutments right hand side view



Fig. 19: Copings left hand side view



Fig. 20: Completed bridge – anterior view



Fig. 21: Completed bridge – left hand side view



Fig. 22: Copings cemented in the mouth – phosphate cement



Fig. 23: Bridge cemented over the copings with 'soft cement'

ration is required (which may not always be possible) and there are also two finish lines. Although advantageous in an aesthetic restoration (Fig. 12 to 23), it may not always be possible to keep both of these metal margins sub-gingival. Should extra tooth preparation not be completed then an over-contoured bridge or one that shows excess opaque porcelain on the labial surface may result.

Conclusions

Gold copings can be an excellent long-term, or provisional restoration as the coping can protect the tooth from caries and cementation failure. Maintenance is made easier by the ability to remove the superstructure at will. Aesthetics can often be compromised by the need for greater tooth reduction and often two visible metal margins. [DOI](#)

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Professor Paul Tipton BDS, MSc, DGDRC (UK)
DENTAL SURGEON

Visiting Professor of Restorative and Cosmetic Dentistry, City of London Dental School | www.colds.co.uk
SPECIALIST IN PROSTHODONTICS | www.drpaulltipton.co.uk
T Clinic @ Manchester, London | www.tclinic.co.uk
TIPTON TRAINING Ltd | www.tiptontraining.co.uk
www.bard.uk.com
President of the British Academy of Restorative Dentistry (BARD)

Endodontic treatment, retreatment and permanent cementation of full ceramic CAD/CAM crown in one visit

Clinical case

By MUDr. Marek Šupler, MPH

Introduction

One visit dentistry is becoming more and more popular among patients nowadays. The reasons behind are various – lack of time due to work, unwillingness to come several times, parking issues, and many others. A rising demand for treatment that includes as few steps as possible is becoming a strong trend among patients. In some cases, all that needs to be done is acquire more knowledge on endodontic treatments, a suitable rinse protocol and usage of FRC pins. As far as the prosthetic work is concerned, modern chairside CAD/CAM systems allow to achieve a very efficient and rapid post-endodontic completion and reinforcement of the tooth.

This study reports how one visit treatment can cover endodontic,

endodontic retreatment, through usage of FRC pin, and permanent cementation of full ceramic crown, using MyCrown.

Patient first contact

32 years old woman came to our dental clinic with broken tooth no. 14 and asked for emergency treatment as the tooth is in the smile area and the patient stated she felt deficient and uncomfortable when working and speaking with people. (Fig. 1, Fig. 2) After taking an intraoral X-ray and status analysis, we suggested RCRT (root canal endodontic retreatment), followed by treatment with FRC (fiberglass-reinforced composite) post and reconstruction with ceramic crown, made by CAD/CAM system MyCrown.

Endodontic treatment

During the treatment with Zeiss Opmi Pico microscope, it was found,

that the palatal root canal was not treated at all. Subsequently, the vestibular root canal retreatment and palatal root canal treatment were performed using a standard rinse protocol using 5% NaOCl, 0.2% CHX and EDTA. To fill the root canals M-Two system ISO 25/06% - gutta-percha and Bee-Fill system were used. (Fig. 3)

Immediately after the endodontic treatment, the palatal part of the gingiva was removed by electrotome. The FRC ENA post was placed in the palatal root canal. After removing a portion of gutta-percha from the filled root canal, 6mm deep, the dentin was etched with orthophosphoric acid for 30 seconds and then rinsed with water from syringe for 30 seconds. The ENA bond was mixed with the polymerization activator in a 1:1 ratio and applied to the dentin with microbrush and also to the pre-silanised pin. Subsequently,

ENA CEM - dual curing resin cement was applied to the duct and FRC post was introduced. Enlightenment with curing light 30 seconds. The crown part of the tooth was rebuilt by the same ENA CEM - dual curing cement. Thus, the tooth was ready for shoulder preparation before the digital impression. (Fig. 4)

Gingiva management

After shoulder preparation and preservation of all parameters for the next restoration, the tooth was prepared for digital impression. Firstly, it is most important to make the edge of the preparation as clear as possible. This is the most important thing in defining the future restoration. This has resulted in proper gingival management. In this case, a two-cord technique was used. (Fig. 5) A thinner fibre was first put into sulcus without haemostasis solution. Subsequently, a fibre with thickness 3, impregnated with aluminium

chloride, was put for faster and better haemostasis and retraction. After 5 minutes, the thicker fibre is drawn, the thinner one is left and the edge of the preparation is clearly visible.

Treatment with MyCrown

The scanning area must be dry before every digital impression. For better access to the oral cavity we use OptraGate. By using DryTips, the saliva of gl. parotis is stopped. Lingua-Fix fixes the tongue while removing saliva with suction from the sublingual gland. (Fig. 6)

After drying the area of interest and applying sufficient amount of HD FONA spray, scanning can begin. First, the area of restoration is scanned, then the opposite jaw, and finally a buccal scan to register the occlusion. After correlating the



Fig. 1. Subgingival tooth fracture



Fig. 2. First patient check



Fig. 3. During endo with FRC endodontic posts.



Fig. 4. After endodontic treatment



Fig. 5. Two-cord technique

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Fig. 6. Saliva isolation (other patient)

models with the software, the edge of preparation is drawn (Fig. 7) and after defining the insertion axis, the crown is designed.

MyCrown Design software calculates the first proposal based on the surrounding teeth and gives a patient-specific and aesthetic restoration proposal. A quick adjustment was required due to a small improvement of contact points with neighbouring teeth. (Fig. 8)



Fig. 7. Margin draw

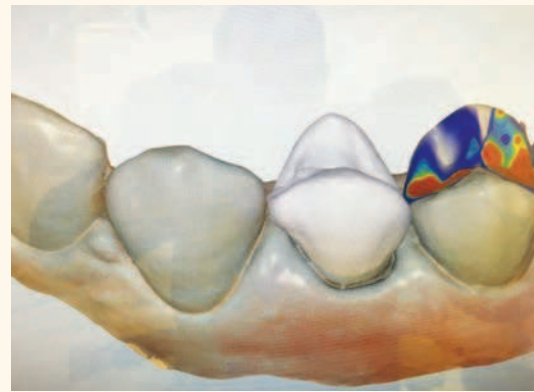


Fig. 8. First crown proposal

After crown modelling, contact points and occlusal contact points satisfaction, we went to the next step - Manufacture (Milling process). Once the milling was over, we polished the tooth and sat it on the preparation. After checking the points of contact and occlusion, the crown could be cemented. Cementation was done by Variolink by Ivoclar due to its great cementation shade/opacity control and adhesive attributes.

Result

The colour of the crown seems to be darker after cementation. Lighter shade of the neighbouring teeth is caused by loss of moistness due to the length of the procedure. (Fig. 9) We asked the patient to come in several hours or the next morning to check the colour. She called only to say everything is perfect and she is very satisfied with this restoration. We have to rely on her judgment and believe that the colour really is satisfying.

Conclusion

This clinical example demonstrates, that if we have sufficient knowledge of latest dental trends and suitable equipment, we can help the patient in one session, even in more complicated cases that would otherwise require multiple appointments.

MyCrown allowed to create a perfectly fitting restoration within one visit. The initial software proposal of the crown design was approved al-

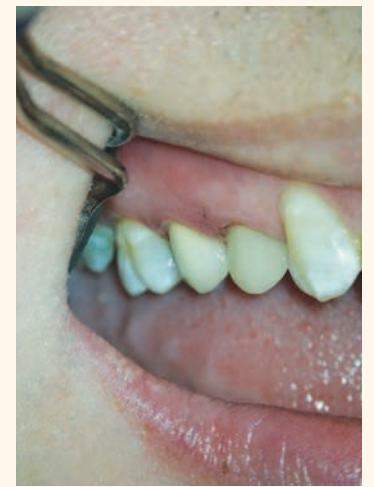


Fig. 9. Aesthetic final result and happy patient

lowing to place the restoration into the patient mouth within minutes of its completion.

We should always consider every patient is different and should be treated with a unique approach, based on the indication. MyCrown illustrated the benefit of being able to offer restorative treatment in a single visit. ^[D]

Aesthetic rehabilitation and tissue preservation in the anterior region

By Dr Jan-Frederik Güth & Hans-Jürgen Stecher, Germany

While there are often several adequate prosthetic treatment options to choose from for one single case, there are some cases where none of the proven solutions seems to be perfectly suitable. The prosthodontist and his team have to balance the pros and cons for each available option – they have to decide which treatment is best suited to fulfil the needs of the specific patient. This was the case with a 16-year-old female patient who presented at the Department of Prosthodontics of the Ludwig Maximilians University of Munich, Germany in 2015. An orthodontic treatment had just been completed and a further prosthetic rehabilitation was required.

Background

At the age of 10, the patient had suffered an anterior tooth trauma with avulsion and replantation of the maxillary central incisors (teeth 11 and 21, FDI notation). Despite all efforts, it had not been possible to preserve tooth 21. The former dentist had replaced it with a four-unit metal-ceramic adhesive bridge (Maryland bridge) (Figs. 1 & 2).

Unfortunately, the dismal prognosis for tooth 11 was confirmed in the course of treatment: it had to be extracted during orthodontic therapy. In order to replace both central incisors for the duration of this therapy, a provisional bridge with artificial gingiva was manufactured and attached to the fixed orthodontic appliances (Fig. 3).

Prosthetic treatment plant

At the patient's first visit in the private dental office of the LMU Munich, the lateral incisors had large composite restorations not only on the vestibular surfaces, but – due to

the previous rehabilitation with an adhesive bridge – also on the palatal surfaces (Fig. 4).

Tooth 22 had received an endodontic treatment. This fact significantly limited the prosthetic options and had a negative effect on the prognosis of this tooth. The developmental stage of the cervical vertebrae assessed by the orthodontist using lateral cephalometric radiographs revealed that only minimal transversal and horizontal growth was still to be expected for this patient. Due to this fact and the unfavourable prosthetic value of the abutment teeth, the prosthodontic team – in consultation with the patient – decided to place an all-ceramic adhesive bridge with two wings bonded to teeth 12 and 22. The aim of this treatment was to postpone the placement of implants as long as possible in order to ensure that the patient was fully grown when this intervention was carried out. By use of a fixed restoration, the team strived for the best possible support and preservation of the surrounding soft and hard tissues.

First steps

After removal of the fixed orthodontic appliances, the direct restorations of the maxillary lateral incisors were replaced by new composite restorations. Tooth preparation had already been carried out on these teeth to place the former metal-ceramic bridge. Hence, it was not necessary to remove large amounts of additional tooth structure, however, the existing palatal preparations required refinement. Subsequently, gingiva management was carried out with retraction paste. An impression was taken with the 3M True Definition Scanner and uploaded to the 3M Connection Center. The patient received a removable interim prosthesis (Fig. 5).



Fig. 1: Situation prior to the orthodontic treatment with an adhesive bridge used to replace tooth 21.



Fig. 2: The adhesive bridge shows a compromised fit after repeated removal and placement.



Fig. 3: Snapshot during orthodontic treatment with temporarily replaced central incisors. (Image 1–3 courtesy of Prof. A. Wichelhaus)



Fig. 4: Situation at the first visit of the young female patient at the LMU Munich private dental office.



Fig. 5: Patient with interim prosthesis after removal of the orthodontic appliances, replacement of the fillings and palatal tooth preparation.

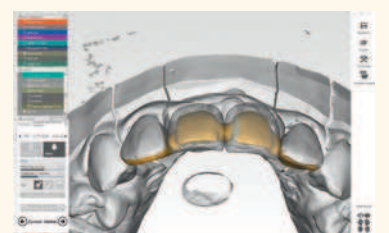


Fig. 6: Computer-aided framework design starting from the anatomical tooth shapes using the Zfx CAD Software.



Fig. 7: Precise fit of the sintered framework on the model.



Fig. 8: Try-in of the restoration in its fired, unglazed state.



Fig. 9: Precise fit of the wings in the palatal area.

Laboratory procedure

In the dental laboratory, the digital impression file was downloaded, a physical model ordered and the data set imported into the Zfx CAD-Software for the design of the adhesive bridge framework.

The bridge was designed in full contour. The recommended parameters (minimum wall thickness, connector strength etc.) for the selected material – 3M Lava Plus High-Translucency Zirconia – were entered into the soft-

ware. Then, the bridge was automatically reduced to the framework (Fig. 6).

This procedure is beneficial in that it provides for a uniform strength and optimal support of the veneering porcelain. The framework was milled, thinned out at the margins using a fine diamond rubber polisher, individualised with dyeing liquids, and sintered. The precise fit of the wings to the palatal tooth surfaces was confirmed on the model

before the porcelain layering was performed (Fig. 7). Figure 8 shows the situation at the biscuit-bake try-in.

Finally, the adhesive bridge was finished and glazed. On the model, a highly accurate fit was obtained (Fig. 9), and the restoration showed a natural appearance (Fig. 10). This is in part due to the high translucency of the framework material (Fig. 11).