The chairside use of a dual-cure composite for temporary restorations

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Dr Janine Sohota *graduated in 2012 from Birmingham Dental School (United Kingdom). She has worked primarily in private practice for 6 years now and has a special interest in cosmetic dentistry and smile makeovers. Janine has obtained a postgraduate degree in Implant Dentistry at the London College of Oral Implantology and regularly attends dental courses to ensure her practice is dynamic and progresses with the current surge in the demand for cosmetic dentistry in the UK.*

Cosmetic dentistry has rapidly been gaining momentum over the past decade but now it is not just for the wealthy. Many more patients are choosing to invest in their smile, there is ever increasing demand for dental practitioners to be able to provide beautiful, aesthetic results for a diverse range of patients. Any dentist providing crown-and-bridge work must be able to place high-quality temporary restorations which do not only look good but are also durable to withstand masticatory forces whilst the final restoration is manufactured.

What do we desire from our temporary restorations?

- Look natural and aesthetic. Patient's having dental work don't want it to be obvious that they are amidst treatment.
- Maintain the soft tissue. Particularly anterior restorations, if the soft tissue is not respected by a well fitting temporary then there is danger the gingiva could recede, leading to black triangles which could compromise the aesthetics.
- Provide function for mastication. We need temporaries to last, they need to be durable so a patient can still function as normal.
- Maintain the occlusion and space. A temporary will prevent adjacent tooth movement and drifting as well as preventing over eruption. Hence, when the final restoration is delivered, there should be no occlusal interferences.
- Ease-of-use for a general dentist for a quick chairside construction.

The two cases below aim to show the importance of a correct provisional for the long term success of a treatment.

Case 1: a fractured central incisor

Fig. 1: Fractured incisor #21

A 65-year-old gentleman presented to me as an emergency patient. His upper left central incisor had severely fractured (Fig. 1). Luckily, there was no pain or any pulpal exposure. However, it was not a good indication for a direct restoration. After radiographs and vitality testing, it was decided to restore the tooth with a crown. The shading of the adjacent teeth was extremely varied with the most unusual presentation, particularly on the upper right central incisor. It is known that the most challenging treatment for a dentist is the replacement of one single central incisor.

Luckily, the patient had brought along the fractured portion of his tooth (Fig. 2).

Fig. 2: The detached tooth fragment

I reattached this piece using G-ænial Universal Flo X (GC) composite for the purpose of taking an alginate impression that I would then use after the preparation to make a chairside temporary with TEMPSMART DC (GC).

The treatment plan:

- Prepare tooth abutment for a zirconia crown with buccal porcelain layering. This would enable an aesthetic outcome with the desired effects on the buccal surface to include translucency and micro-fracture lines.
- Take a two-stage putty wash impression using retraction cord.
- Note stump shade of abutment and photograph for the ceramist
- Construct chairside temporary crown using TEMPSMART DC (GC), shade A2 and affix with temporary cement (Fig. 3).
- Wait two months before placing the crown to leave sufficient time for assessment of a possible devitalisation after preparation.

Using the VITA Toothguide 3D-MASTER® (Vita), a detailed lab sheet was sent to the ceramist. This was by no means a beautiful case or a smile makeover with bright white teeth but rather a case of accepting nature and mimicking the adjacent teeth which was all the patient wanted. He had no desire for a smile makeover or whitening, he just wanted his front tooth back.

Fig. 3: TEMPSMART DC dual-cure composite for temporary restorations

The tooth was vital and asymptomatic; despite the limited amount of tooth tissue there was certainly an adequate ferrule (Fig. 4), which is the key to retention and longevity of the crown. Hence, an elective root canal treatment and post placement, could be avoided. Recent studies show that the insertion of a post does not enhance the load-bearing capacity of an all ceramic crown[1].

Fig. 4: Rough preparation before final polish and refinements

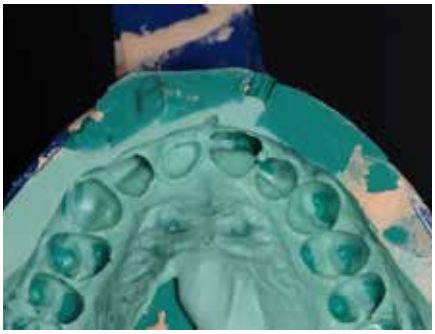

Fig. 5: Two-stage putty wash impression of the preparation

Using the preoperative alginate (Fig. 5), a temporary crown was fabricated and inserted with temporary cement (Fig. 6). TEMPSMART DC has excellent handling properties and the fact that the setting process can be increased by the dual-cure function ensures a good final result. There were no air bubbles or voids which unfortunately I have learnt to expect with other materials.

Two months later, the temporary crown was removed. The interdental papillae had been maintained and there had been no issues with fracture or displacement of the temporary crown. No hypersensitivity was reported and the tooth had remained vital. The zirconia crown was placed, looking natural, full of the desired characteristics (Fig. 7).

An upper night guard was created because of the patient's traumatic edge bite to prevent any overnight shear/tensile forces from displacing the crown.

The tooth is to be monitored now, and the patient was informed that a future root canal treatment may be required if late pulp complications would occur.

Fig. 6: Temporary restoration with TEMPSMART DC

Fig. 7: Final restoration (a) intraoral view; (b) detailed intraoral view; (c) smile

Case 2: replacing an old porcelain fused to metal (PFM) bridge

This next case was much more straightforward.

A patient presented with a lower left quadrant 3-unit bridge (PFM). It had been present for some years but recently the porcelain had chipped off exposing the underlying metal. The patient found the sight of metal in his mouth unacceptable and requested a replacement bridge.

After making radiographs and a full clinical examination, I decided we would remove the old bridge and re-prep for a monolithic zirconia bridge. This has the advantage that this material has an increased fracture resistance (1200 MPa).

The patient was very conscious about the temporary restoration needed during the two weeks in which the bridge would be fabricated. He had recently completed Invisalign treatment and wanted to ensure that the temporary bridge was compatible with his retainers so as to prevent any unwanted tooth movement.
Once the bridge had been removed and re-prepped, pre-operative alginate was used to construct a temporary bridge with TEMPSMART DC (Fig. 8).

Fig. 8: Temporary bridge made with TEMPSMART DC

After some finishing/trimming, it was filled with temporary cement (Fig. 9) and then placed *in situ* over the abutments (Fig. 10).

Two weeks later, the final bridge was delivered (Figs. 11 and 12); the occlusion was stable and no adjustment was needed.

Conclusion

The ease-of-use of TEMPSMART DC was excellent; the ability to dual-cure with a curing light increased the speed at which a temporary can be placed therefore allowing appointment times to be utilised efficiently. I also found it easy to adjust and trim the restorations with just scissors, which I prefer. All temporaries lasted during the entire time in function.

Fig. 9: Temporary bridge before cementation

Fig. 10: Temporary bridge in situ

Fig. 11: Final zirconia bridge (a) occlusal view; (b) intaglio surface

Fig. 12: Final zirconia bridge. Intraoral after placement

References

1. Magne P, Lazari PC, Carvalho MA, Johnson T, Del Bel Cury AA. Ferrule-Effect Dominates Over Use of a Fiber Post When Restoring Endodontically Treated Incisors: An In Vitro Study. Oper Dent. 2017 Jul/Aug;42(4):396-406.