British Institute
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Technologists

CPD Article

ISSUE 23

Proud of our History, Looking Forward to the Future

BIDST CPD

This learning session has been judged as being equivalent to one hour of verifiable CPD. To claim your verifiable CPD you will need to answer the questions at the end of this article and submit them either by email to secretary@bidst.org or by post to the BIDST Membership Office 44-46 Wollaton Road, Beeston Nottingham NG9 2NR. You will also need to keep a copy of the article together with your feedback sheet and certificate for revalidation.

1 HR VERIFIABLE CPD

Ref No. 37/03/01

Full upper arch rehabilitation

Helen Horton- Full upper arch rehabilitation

Dr Wilhelm Grotepass, Clinician – The Mews Dental Studio

Jon Dolding, Technician – Jon Dolding Dental Cosmetics

Helen had for several years worn a partial upper denture and had old crowns which needed replacing. As Helen was a long term patient she had come to us looking for a fixed solution to restore her upper arch, but due to clinical reasons was not suitable for implants.

After we had carried out the initial consultation for study models, articulation and diagnostic wax ups, we decided that a telescopic bridge would be the best form of treatment. Wilhelm had experience of doing many telescopic bridges and dentures in South Africa, but until we started working together, he had not felt comfortable working on complex cases in other labs in the area.

In choosing telescopic bridges or dentures, some of the benefits for the patient can be a longer functional period of integrated construction, the simple handling of dentures with double crowns, other benefits include easy cleaning, repairs, extractions or additions in comparison to fixed bridge work. (Figure 1)

Helen presented with heavily filled, some non vital teeth and missing teeth in the upper right quadrant.

Only after completing the planning of the prosthetic treatment, can the preparation, bite taking and impression be carried out in order to construct the master model.

The teeth were prepared and the impressions sent to the lab these were cast in stone, sectioned and trimmed in the normal way and mounted on the articulator with a face bow registration.

Individual pre-planning is essential. Two points to be considered are, the request for sufficient space for the double crown, and is there a danger of putting the vitality of dentition at risk?

The path of insertion is mainly determined through the long axis of the prepared teeth. Ideally this is at right angles to the occlusal plane, respectively slightly labial both in the maxilla and mandible. This was then calculated to achieve an adequate thickness of gold on the primary crowns allowing for a 2 degree taper and suitable space for the bridge components.

Fortunately Helen doesn't have a high smile line and small gold collars were therefore acceptable in the anterior zone.

The dies were then dipped in a yellow wax which was trimmed to a minimum thickness of 0.3mm. The milling wax was then built by hand using the surveying tools as a guide for the taper. Once cooled the copings were milled using a 2 degree wax bur and reduced to minimum thickness at their thinnest part (yellow wax showing through) ensuring that at least 3.5mm² on at least 2 sides and in turn parallel to each other was milled to ensure adequate frictional grip.

The copings were then sprued, invested, burnt out and cast in the normal way using a 60% gold.

Once de-vested and fitted to the dies the occlusal surfaces and collars were ground and polished, then began the time

Fig 1: Gold Primary Copings – Occlusal view

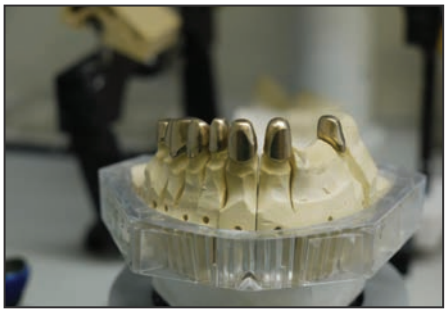

Fig 2

Fig 2 & 3: Gold Primary Crowns - labial view.

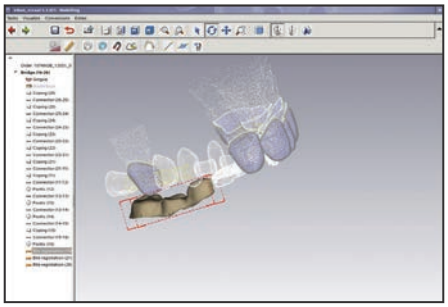

Fig 4

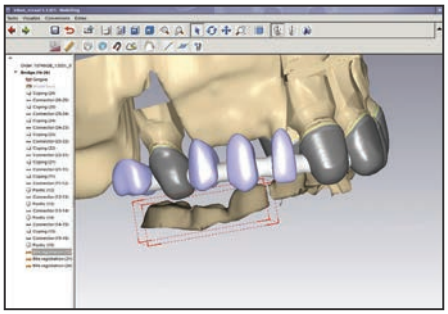

Fig 4 & 5: On Screen Design Images showing antagonist, grey copings, blue pontics and white connectors.

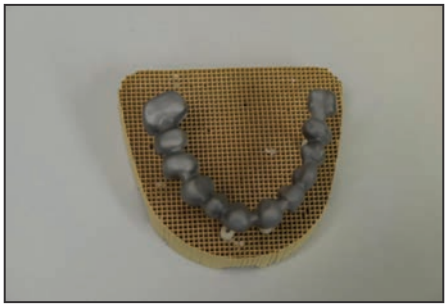

Fig 6

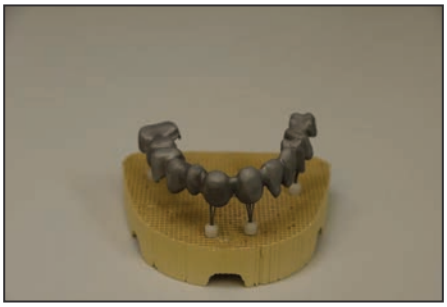

Fig 6 & 7: Coron Frame, pre opaque.

Fig 8: Waxed up and sprued ready for investing.

Fig 9 : On investing former.

consuming finishing of the milled surfaces with staged burs to achieve high shine tapered surfaces on all of the primary crowns. (Figures 2 & 3)

With all of the gold copings painstakingly cast milled and finished a small pattern resin nipple was applied to all of the primary copings on the palatal and buccal surface to allow for accurate positioning and hold in the pick up impression.

It was around this time that I decided to invest in the Straumann CAD/CAM scanning system. Had I known how the scanner would have simplified the whole process, from determining the path of insertion, design and manufacture of the primary crowns in polycon cast with 2 degree taper and collar, I would have purchased it sooner!

The design of the bridge was done with the help of Jeremy Foster at Straumann, I felt that for a first case this might be a bit too technical regardless of how simple the software is to use. Once the design and cement gap had been agreed upon the digital information was e-mailed to the milling centre in Leipzig, Germany for manufacture in Coron milling alloy. (Figures 4 & 5)

Two days later the Coron bridge was back in the lab where the fits of the individual primary crowns inside the bridge could be checked and the overall seating accuracy and retention of the bridge on the model was checked, all exceeded my expectations. (Figures 6 & 7)

The bridge was sandblasted according to the manufacturers' specifications and opaqued with Ivoclars' InLine PoM ceramic, full contour wax ups were then copied from the original diagnostic wax ups using silicone keys and the information transferred onto the metal framework. The occlusion was carefully checked and the sprues attached to the wax frame. (Figures 8 & 9)

Once the positioning guide was placed I realised that the restoration was too high in the ring and needed more ceramic than the 6 pellets allowed, which meant I would not be able to proceed with the planned PoM technique.(Figures 10 & 11)

The wax was boiled off and the opaque was removed using 30% hydrofluoric acid as I didn't want to damage the metal framework by over blasting with aluminium oxide. The frame was then cleaned and re-blasted ready for opaquing

Fig 10

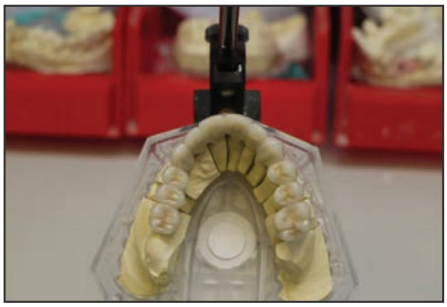

Fig 14: Occlusal view

Fig 18: Primary crowns in situ.

Fig 10 & 11: On former and positioning guide showed bridge was too large for PoM technique.

Fig 15: Labial view

Fig 19: Bridge in place right buccal corridor.

Fig 12: Finished Bridge - built in ivoclar d.sign 97 porcelain. Left hand view.

Fig 16

Fig 20: Bridge in place left buccal corridor.

Fig 13: Right hand view

Fig 16 & 17: Fit surface lightly polished with 50 micron glass beads.

Fig 21: Labial view.

with Ivoclar IPS d.sign ceramic using traditional veneering techniques. (Figures 12, 13, 14, 15, 16 & 17)

The Coron alloy had a favourable CTE to the d.sign ceramic which allowed the bridge to be completed with just three body firings and one glaze firing where small areas of staining were applied to the cervical, interproximal and occlusal surfaces.

The copings and bridge were tried in to ensure that the patient was happy with the aesthetics and the surgeon happy with the clinical aspect, no adjustments were necessary. After the copings were cemented the bridge was placed using Vaseline allowing a week for any micro movement to occur in the patients' natural dentition prior to cementing with temporary crown cement. There were a couple of areas of slight blanching but this was felt to be acceptable and no adjustments were made. (Figures

Fig 22: Fit surface 1 year later showing no sign of wear or tight spots

18, 19, 20 & 21)

Helen returned to the practice one week later for the bridge to be checked. Fortunately everything was fine and Helen asked Wilhelm not to cement the bridge in place as the frictional grip was proving more than adequate holding the bridge in place, in all eating situations so far, and did not need the Vaseline.

She also loved the fact that she could remove the bridge and clean around the primary copings easily. Wilhelm agreed to this advising her that when the bridge is removed the primary construction lacks any antagonistic contact. Therefore it is important that she wear her bridge over night and only remove it for short periods for cleaning. Also if the bridge started to become slack then she must return and have it cemented.

Helen had a 6 month review where all went well and showed improvements in her oral hygiene.

I was invited to attend her 12 month review and was delighted to see her again and find out how pleased she was with what had been achieved.

The small gold collars that had been visible 1 year earlier were now not showing due to her improved gum condition. The improved gum condition had been as a result of easy and thorough cleaning by the patient and the exceptional fit of the primary copings and telescopic bridge. The milled fit surface was also smoother than any cast surface and so was not causing any wear to the gold primary copings allowing Helen to continue removing the bridge at her convenience. (Figure 22 & 23)

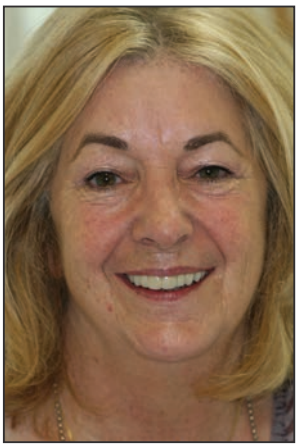

Fig 23: Very happy patient Helen.

CPD Questions Ref No. 37/03/01

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Q1.) Helen presented with heavily filled, some non-vital teeth and missing teeth in which quadrant?

Q2.) Why was individual pre planning essential?

Q3.) Why were the small gold collars acceptable in the anterior zone?

Q4.) When the copings were sprued, invested, burnt out and cast, how much gold was used?

Q5.) Which system simplified the whole process?

Q6.) Which alloy was the bridge manufactured in?

Q7.) At the 6 month review, where did the patient show improvements?

Name:

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