Advanced restorative techniques and the full mouth reconstruction: Duralay Bonnets. Part 7

By Prof. Paul Tipton, UK

Impressions techniques demand a high degree of accuracy for the completion of advanced restorative cases. Often this is a difficult procedure for the restorative dentist when taking impressions both sides of the mouth at the same time (as a full arch impression where there are multiple teeth present) or undertaking an impression of mobile teeth as in the case of a Lindhe/Nyman-style bridge.

The following article will review the technique of using ‘Duralay Bonnets’ or copings as an impression technique and suggest circumstances where the technique would be most appropriately used.

Complex Bridgework

The standard way of completing a full mouth or partial reconstruction is always to follow the following principles:

- Establish posterior stability
- Prepare anterior teeth
- Establish correct anterior guidance
- Restore anterior crowns/teeth
- Restore posterior crowns/teeth

In this way, following the basic rules, the full mouth/partial reconstruction is broken down into easily negotiable stages.

Complete Crown and Bridgework

However, from time to time the rules are made for breaking and if anterior and posterior teeth are connected together in the form of bridgework, an alternative solution is required. In cases like these the same steps 1-3 are taken, however step 4 is preparation of posterior teeth and fitting of prototypes. Impressions are then taken of anterior teeth and posterior teeth in three different impressions – i.e. UR, UL and anterior and the impressions are silver plated before duralay copings are made on them.

The technician sends back duralay copings, coat hanger wire for strength, special tray, and often a second set of copings to use as a jaw registration. Once the copings are placed onto the tooth preps in the mouth and verified as properly seat ed, the coat hanger wire is placed and connected to the individual copings with further duralay using the “dead on technique”. A further pick up impression is then taken.

Once in the lab, the technician places the silver dies into the master impression and casts the master model. He can then produce his definitive work on this model of the whole arch. In case 1 the gentleman had an upper reconstruction including crown and bridgework. Mr. W was referred with missing upper teeth and worn remaining upper dentition (Figs. 1-4). Upon manipulation back to RAP we had an edge to edge occlusion. The teeth were individually prepared and mesh prototypes fitted (Figs. 5, 6), and initial impressions taken for the definitive silver dyes. Duralay copings were fabricated by the technician and placed onto the tooth preps at the next visit (Figs. 7, 8). These were connected together with duralay and coat hanger wire using the “dead on technique” (Figs. 9, 10). A final impression was then taken with missing upper teeth and worn remaining upper dentition (Figs. 14). Upon manipulation back to RAP we had an edge to edge occlusion. The teeth were individually prepared and mesh prototypes fitted (Figs. 5, 6), and initial impressions taken for the definitive silver dyes.

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taken and the copings picked up using im-
pregum impression material (Fig. 11). The de-
finitive crown and bridgework was then con-
structed and cemented (Figs. 12, 13).

Mobile Teeth
An additional difficulty when taking impres-
sions is if the teeth or some of the teeth are mo-
bile. The force of seating the impression mate-
rial onto the teeth even with light and medium
body polyvinyl siloxane material can move the
teeth into positions that are not in a neutral po-
sition. Thus the master model will not replicate
the natural position of the teeth and inaccura-
cies will arise in the final restoration.

In order to alleviate the discrepancy between
the master model and the natural position, du-
ralay bonnets are used. If not, then bridgework
often will not fit passively; the occlusion will be
incorrect and need major alteration; contact
points may be open or tight and margins will
not fit.

Case study 2 shows a case of a lady with mobile
teeth who opts for a Lindhe/Nyman bridge
rather than implants (Figs. 14-23). A full descrip-
tion of this type of bridge will follow in the next
part of the series.

Teeth and Implants
A further use for the duralay bonnets is when
there are teeth and implants in the same jaw
that need restoration. The standard way of
restoring implants is by the use of pick up im-
pregnum copings onto the head of the implant.
In order that the crowns on the implants and
on the teeth can be made together (rather than
risking problems of colour matching if mak-
ing the crowns first on the natural teeth and
then at a later stage matching the crowns on
the implants) duralay bonnets can be made on
the teeth as previously described. These are fit-
ted onto the prepared teeth and standard im-
plant pick up impression copings placed onto

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the implants. A pick up impression is then taken as before. Case study 3 shows the technique where both teeth and implants are restored with crowns in the same arch (Figs. 24-29).

Conclusions

Whilst this technique of duralay bonnets requires two lots of impressions (two stages) and appears to increase the clinician’s time, the benefits of having excellent fit, occlusion etc. far outweigh the extra time taken.

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Solution

IPS Empress Direct is a well-designed composite system consisting of two composite layers. These properties include brightness, saturation, hue, translucency, opalescence and fluorescence. A well-considered layering technique and accurate shade selection contribute towards an optimal outcome.

Challenge

A natural tooth is composed of different layers of tissue. This plays a particularly important role in the restoration of anterior teeth.

Characteristics of the natural tooth structure should be reflected in each composite layer. These properties include brightness, saturation, hue, translucency, opalescence and fluorescence. A well-considered layering technique and accurate shade selection contribute towards an optimal outcome.

Challenge

A natural tooth is composed of different layers of tissue. This plays a particularly important role in the restoration of anterior teeth.

To obtain a natural-looking vibrant restoration, the natural tooth has to be replicated in fine detail. In addition to the anatomy, the optical characteristics of the natural tooth structure should be reflected in each composite layer. These properties include brightness, saturation, hue, translucency, opalescence and fluorescence.

Clinical case presentation

A 7-year-old female patient presented with a fractured maxillary central incisor. Approximately one third of the incisal area was fractured on both teeth. The patient requested a fast and minimally invasive restoration. A composite layering technique (IPS Empress Direct) was performed on the right tooth.

A polarization filter assisted in evaluating the internal and external colour distribution of the natural teeth (Fig. 3). On the basis of the values measured and the natural tooth colour, we selected the appropriate shade for the restoration, including A2 and A3 for the dentin, A2 for the enamel as well as Trans 30, Trans Opal and suitable characterization shades.

Dental tissues exhibit different degrees of mineralization and therefore show different optical properties.

By Dr Yao Lv, China

Impressive developments have been introduced in the market of composite materials in recent years. Nano-hybrid composites such as IPS Empress® Direct have enabled dentists to offer their patients adhesive restorations that meet the requirements for functional and esthetic excellence. A well-considered layering technique and accurate shade selection contribute towards an optimal outcome.

Minimum invasiveness – optimum results

Achieving a functional esthetic restoration using a state-of-the-art treatment method is the overriding objective of any dental treatment.

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To reconstruct the incisal area, Trans 30 was mainly applied, while Trans Opal was mostly applied to imitate the structural features of the incisal ridge. To ensure a high bond strength, I applied the total-etch technique using Tetric N-Bond®. In addition, I recommend using the Optiartic® polishing instruments. Fillings can be shaped more easily – the Optiartic Pad is particularly handy when contouring anterior restorations. A rubber dam was applied to provide absolute isolation and adequately expose the tooth surfaces to be restored.

Step by step

With a minimally invasive technique, wave-shaped bevels were prepared on the teeth. This preparation design generally results in an increase in bond strength and enhances the intrinsic vibrance of the restoration (Fig. 3). Once the teeth were prepared, 37 % phosphoric acid was applied. The bonding surfaces were etched for 20 seconds (Fig. 4). The adjacent teeth were covered with Tektron tape to prevent the phosphoric acid from coming in contact with them during the etching procedure. Subsequently, Tetric N Bond was applied to the enamel surface and allowed to react for 10 seconds.

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