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.

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 anteriors 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 seated, 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 and the copings picked up using impregum impression material (Fig. 11). The definitive crown and bridgework was then constructed and cemented (Figs. 12, 13).

**Mobile Teeth**

An additional difficulty when taking impressions is if the teeth or some of the teeth are mobile. The force of seating the impression material onto the teeth even with light and medium body polyvinyl siloxane material can move the teeth into positions that are not in a neutral position. Thus the master model will not replicate the natural position of the teeth and inaccuracies will arise in the final restoration.

In order to alleviate the discrepancy between the master model and the natural position, durayal 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 description of this type of bridge will follow in the next part of the series.

**Teeth and Implants**

A further use for the durayal 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 impression 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 making the crowns first on the natural teeth and then at a later stage matching the crowns on the implants) durayal bonnets can be made on the teeth as previously described. These are fitted onto the prepared teeth and standard implant pick up impression copings placed onto...
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. 24-34).

Conclusions
Whilst this technique of duralay bon-

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

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.

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.

Solution
IPS Empress Direct is a well-designed composite system consisting of 32 shades, five levels of translucency and seven characterization shades. With its versatile range of shades, IPS Empress Direct meets all conceivable requirements that could be placed on an esthetic composite. Additionally, the material is characterized by an exceptionally low sensitivity to ambient light, affording dentists sufficient time to layer the composite and mould the restoration to give it a natural shape.

The case presented below provides an example of how an optimal restoration can be achieved with IPS Empress Direct.

Clinical case presentation
A 7-year-old female patient presented with fractured maxillary central incisors. Approximately one third of the mesial area was fractured on both teeth. The patient requested a fast and minimally invasive restoration of the broken teeth. She did not want healthy tooth structure to be cut, which meant that crown restorations were not an option.

A detailed clinical examination showed that the pulpal tooth 21 was exposed but the periodontal tissues were undamaged (Fig. 1). After informing the patient of the treatment choices, we decided to perform endodontic treatment on tooth 21 and then reconstruct tooth 21 and 22 using a composite layering technique (IPS Empress Direct). A lingual sili-cone key would help in establishing the correct tooth shape.

A polishing filter assisted in evaluating the internal and external colour distribution of the natural teeth (Fig. 2). On the basis of the values measured and the natural tooth colour, we selected the appropriate shades for the restoration, including A2 and A3 for the dentin, A2 for the enamel as well as Trans 10, Trans Opal and suitable characterization shades.

To reconstruct the translucent enamel area, Trans 30 was mainly applied, while Trans Opal was mostly applied to imitate the structural features of the incisal edge.

To ensure a high bond strength, I applied the total-etch technique using Tetric N-Bond®. In addition, I recommend using the Optiraculp® moulding instruments. Fillings can be shaped more easily – the Optiraculp 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 prepara-
tion design generally results in an increase in bond strength and enhances the intrinsic vibrancy 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 Teflon 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.