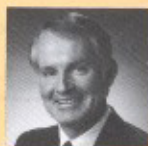


Compiled by Geoffrey M. Knight



There is an aesthetic solution known as the full upper and lower denture that provides practitioners with total cosmetic control over the clinical environment. It is unfortunate that patients no longer see this as a preferred option, and dentists are now being asked to find creative solutions within the fiscal and biological constraints imposed by their patient's perception of dentistry.

## The metal reinforced direct resin laminate bridge

While nothing works all of the time, some things work most of the time and the following case describes the handling of an unusual clinical problem by constructing a metal reinforced direct resin laminate bridge.

Direct composite bridges are a simple and reliable clinical means of replacing a missing tooth. However, if a patient has a heavy bite, the prognosis of a double cantilever direct resin bridge is unacceptably poor.

Composite bridges may be reinforced with various types of fibres or metal frames with surfaces that have been etched to enable the resin to bond to them. The advantage of metal over the fibres is that it provides a fixed framework which acts both as a spatial guide and a template from which pontics may be constructed.

The attachment section of the frame is constructed to form a band that circumvents the abutment tooth. Preparation should be minimal and is usually limited to removing just over half a millimetre of enamel at the proximal region to enable the band to pass through this area. Compared to conventionally prepared abutments, the greater diameter of the band affords a superior retention and resistance form (Diagram 1) that is further enhanced by the higher and more predictable adhesive strengths achievable by bonding the frame onto enamel and not dentine. Furthermore, if there is no exposed dentine there is a reduced likelihood of caries at the restorative interface.

The disadvantage of this type of prosthesis is the presence of the metal band on the labial and lingual surfaces and while there are procedures to accommodate this, some clinical situations may be unsuitable for the application of this technique.

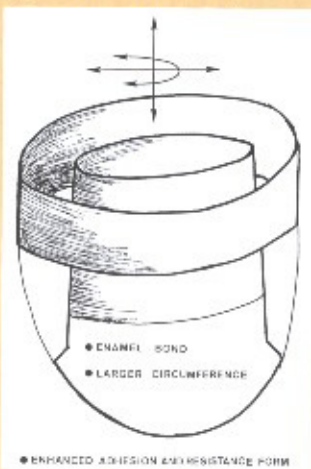


Diagram 1.

A metal band on the labial creates a two-fold problem. Firstly, the dark colour has to be opaqued out and secondly, there is an increased bulk on the labial surface. Masking techniques have generally solved the opacity problems; however, the subsequent veneer required on the facial surface of the abutment may not blend into the overall aesthetics of the smile. This can be resolved by veneer-

ing the adjacent incisors in order to blend in with the labial contour of the abutment tooth. As the band should not encroach beyond the incisal third of the abutment, a feather edge can be created with the resin at the gingival margins to avoid an inflammatory reaction of these tissues.

A closed occlusion will require removal of enamel from either the lingual of the abutment prior to impression taking or from the incisal edge of the antagonist, or both. As the thickness of the band should not exceed one half a millimetre it is usually a straightforward task to accommodate it into the occlusion.

## Case report

The following case report describes a patient who presented with an upper right canine that had been crowned and a cantilever bridge placed to replace the lateral incisor. The root of the canine had subsequently split necessitating an extraction. The aesthetic requirements were only to replace the missing canine and lateral. Furthermore, the patient did not want a partial denture and was adamant not to undergo any further tooth preparation as he believed that this was the cause of the fracture of the canine.

The upper central and left upper lateral incisors had previously been bonded and the only preparation required was the removal of the resin overlays and an unsatisfactory restoration on the distal of 21 (Fig. 1). There was adequate occlusal clearance on the lingual aspects of both central incisors.

Rubber base impressions of upper and lower arches were taken and an etched cast metal frame was constructed that wrapped around both central incisors and extended, within the occlusion, over the areas of the right lateral and canine teeth ►

(Figs. 2 and 3). It was this frame that was to form a base for the construction of a direct resin cantilever bridge.

The canine was extracted and haemorrhage was controlled with trichloroacetic acid. The abutment teeth were cleaned with pumice and water and trichloroacetic acid was further applied at the gingival margins to prevent crevicular exudate contamination during the laminating process. Once the framework had been tried in, the abutments and left lateral were etched for 10 seconds with 37 per cent phosphoric acid, washed and dried with oil free air and a mylar strip was placed proximally between the left central and lateral incisor.

The frame was cemented into place using a light-activated glass ionomer cement (Fig. 4). These materials have an extremely high fracture resistance, inhibit the formation of caries under the abutments and generally give the clinical impression of out-performing the resin cements when used for this purpose.

After cementing the framework, dentine conditioner and universal bond were applied to the etched teeth and metal frame.

A white opaquer was placed over the framework and labial surfaces of the centrals in order to mask the metallic colour (Fig. 5). White opaquer is superior to a tooth-coloured product for blocking out such discoloration. A thin layer of P50 yellow shade (3M) was then placed over the labial surfaces to create a monochrome base shade in preparation for laminating the veneers (Fig. 6).

A mylar strip was placed over the wound at the canine site to prevent contamination of the composite resin from fluid exudates and to provide a highly polished gingival surface for the pontics at the tissue interface (Fig. 6).

The labial veneers were then built up using a multi-layered laminate technique as described in the May 1993 *News Bulletin*. Interproximal surfaces were developed by packing incisal shade resin into a mylar strip and wrapping the strip around the tooth prior to curing (Fig. 7).

A similar multi-layered laminate veneer was placed on the upper left lateral incisor in order to accommodate the slightly fuller labial contour created by the thickness of the metal framework on the abutment teeth.

The laminates were then contoured to create correct anatomical form and to comply with the occlusion of the lower arch. Once this had been achieved the veneers were polished with rubber wheels and discs to bring them to a high lustre. Special attention was spent at the cervical margins of the veneers and to clear the proximal spaces and assure that there were no overhangs that could potentially inflame the adjacent gingival tissues (Fig. 8).

From the lingual aspect it is apparent how the framework fits within the occlusion and provides adequate support for the resin pontics (Fig. 9).

The patient returned at six months for a recall visit to check the bridge.

The healthy state of the gingival tissues was noted as was the slight recession occurring at the cervical margin of the right pontic where the canine had been extracted (Fig. 10). This was considered to be of little clinical consequence as the patients lip line fell well below this point even during the broadest smile (Fig. 11).

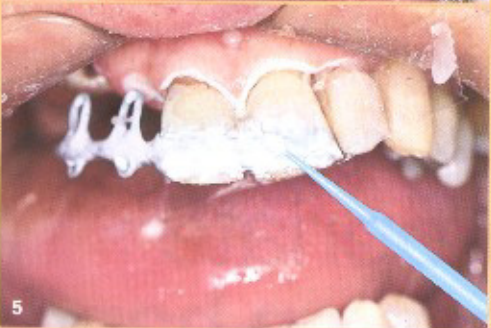
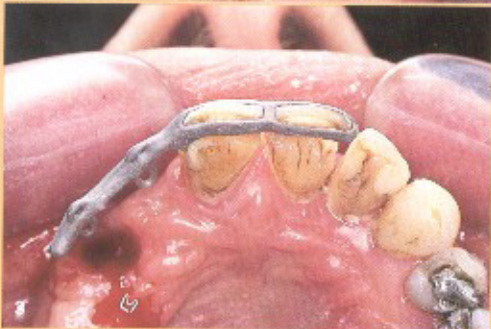
#### Closing remarks

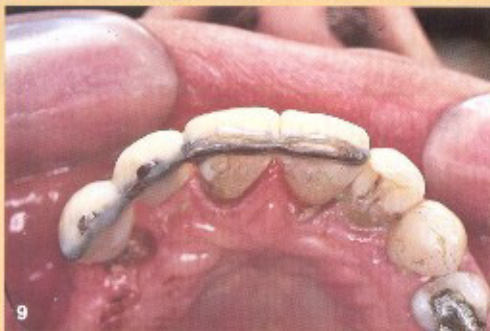
This case study is presented to stimulate practitioners to challenge their perceptions, to investigate the many new materials and to search out creative solutions for some of the clinical problems that daily confront the practising dentist. It is not intended to represent a standard approach to handling this type of clinical situation.

#### Acknowledgement

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