Transition & Production of Occlusal Splints

Since my involvement in these appliances some forty years ago, I have seen significant changes in materials and technique.

The early appliances were made from hard heat cured acrylics using Ball Clasps and/or Adam’s Crib clasps for retention. The greater majority were made for the upper jaw, horse shoe shape, with an anterior platform allowing full disclusion of posterior teeth.

In cases where occlusal contact and opening was required, generally a lower appliance was constructed with acrylic coverage only of the posterior teeth and utilizing a lingual bar and ball clasps.

Improved methods and equipment has seen an increase in the use of vacuum and pressure forming methods for the construction of current day appliances.

The first electric element, vacuum forming equipment reduced the construction time significantly, but still required time and experience to achieve satisfactory results.

Current day vacuum and pressure forming equipment has come a long way and the introduction of computer programmed, signalling equipment is extremely user friendly. Operation can be continuous without concern for over heating blanks. An excellent feature is also the incorporation of an articulated arm, for mounting and accurately indexing the opposing model at the blank forming stage.

Many dentists now train auxiliary personnel to fabricate basic dental appliances in-house, such as temporary shells and bleaching splints. I would highly recommend investment into new generation thermoforming equipment, which allows programmed functions for specific tasks and the amortisation of cost over a short period.

The range of materials available for both vacuum and pressure forming continues to increase with the bi-laminate blanks extremely popular for occlusal splints. This material has a hard acrylic external layer and a soft internal layer, which allows excellent adaptation and retention, which alleviates the need for clasps.

The occlusal splints we fabricate today seem to predominately fall into two categories.

1. **Full upper, horse shoe shape, occlusal splints** with coverage of both anterior and posterior teeth, addition of acrylic canine guidance only as requested. Constructed from bi-laminate blanks, no clasps required.

2. **Anterior jigs**, which are pressure formed to incorporate coverage from 13 to 23 with a small acrylic platform in the 11.21 region, allowing lower anterior contact on the 41.31 only, with total disclusion on all other teeth.

The retention of the anterior jigs can be constructed from a bi-laminate material or by incorporating a hydroplastic material as a liner.

The hydroplastic is a material that quickly softens in hot water to a translucent putty and hardens to a tough unbreakable plastic and is fully remoldable. Currently the hydroplastic material are the most requested, as this material can be heated and adapted to the patient mouth chairside, compensating for any discrepancies in the model and/or impression.

**Anterior jig, hydroplastic lining**

A negative to this method can be over bulk due to greater space required for the layer of hydroplastic and discoloration of the lining material over time.

**Bi-Laminate anterior jig**

Bi-laminate jigs are smaller in cross section, more suitable for cases offering less retention. Negatives can be where cases have extreme tooth positioning and severe undercuts or where models and impressions are compromised.

The advent of advanced new generation pressure and vacuum forming equipment has reduced production time and delivered far more predictable outcomes.