Fibre reinforced post systems

DR MARK LANG looks at restoration techniques using the DT Light Post 'Illusion' Post System…

MODERN dental techniques allow restoration of increasingly difficult and compromised situations. In addition, today's dental patient is more discerning and the appearance of the final restoration, particularly in the aesthetic zone, is liable to close scrutiny.

The technique of placing a post or "pivot" to retain an artificial crown in a pulpless tooth was described in 1871[1]. The rise of implant retained restorations may influence the frequency of post placement but on the assumption that implant retained restorations should predominantly be used to replace missing rather than restorable teeth, the placement of posts looks set to continue. The NHS Scotland Dental Statistics (2007/2008) confirm that 47,443 teeth required some form of intraradicular reinfor-cement as part of the restorative protocol.

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Prefabricated

Metal post systems have been in use for many years and may be prefabricated or custom systems. An inherent problem with metal posts is a tendency for their underlying appearance to shine through the final restoration. In recent times this has become of greater significance with the rise of reinforced all ceramic crown systems, which are increasingly being favoured over porcelain fused to metal crowns. Additionally, their composition and natural rigidity increase the chance of corrosion[2] and the likelyhood of increased stress concentrations apically inside the compromised root. [3-7]

Double taper

The DT Light-Post (DT referring to Double Taper) has been in use for 10 years and is one of the original fibre reinforced post systems. The DT Light Post is composed of pre-silanated translucent quartz fibres reinforcing a heat-cured epoxy resin and is supplied in four sizes with matching tapered drills for post preparation. Placement of this type of post and a tooth coloured core material facilitates placement of an aesthetic, all-ceramic crown.

There are well established traditional guidelines as to the optimal properties and restorative rules of post placement and these have been described by various authors. Post length is critical and should always be at least equal in length to the crown of the tooth to be restored or two-thirds the length of the root canal, whichever is greater[8]. A minimum of four mm of gutta percha should remain in the root canal and at least 1.5 to 2.0 mm of a circumferential ferrule should be available[9]. While creation of this all-important ferrule can be facilitated with orthodontic extrusion and /or crown lengthening surgery, it may now be best practice to consider alternative treatment where this cannot be created[10] and this paradigm applies to all post systems.

Improve adaptation

When considering a prefabricated post the adaptation of the post should ideally be close to the post space and it has been recognised that the root canals of endodontically treated anteriors tend to be larger than most of the available fibre reinforced posts[11]. The double taper of the DT Light-Post attempts to improve post-canal adaptation and increase reliance on the quartz fibre/ epoxy material rather than a bulk of the less favourable composite resin cement (and the interface of this with the post and root face dentine).

Enhanced features

The most recent incarnation of the Light Post system is DT Light Post X-RO and the manufacturers have enhanced some features over a product that has already received a *Five Star Reality Rating* for the last five years. Radio-opacity has been improved and 'Illusion' patented technology, which is temperature sensitive, colour codes the post to allow easy identification of size. On placement of the post, the colour disappears. The elastic modulus of the Light Post is close to dentine and this is favourable since it helps to reduce the incidence of root fracture. When failure does occur, it has been demonstrated that a fibre post reinforced situation is more likely to still be restorable[12].

Fully restored tooth using a DT Light Post 'Illusion'.

Conclusion

In conclusion, while it is encouraging that the properties of the described post system allow predictable and aesthetic restoration of the endodontically treated tooth it would be remiss not to mention that the best approach to avoiding problems is to minimise the risk of endodontic therapy being required. It seems that every journal has examples of extensive dental restorative work and tooth substance seems to be expendable in the pursuit of aesthetics. It is incumbent on the dentist to consider all restorative possibilities and to discuss this fully so that the patient is fully aware of the risks involved. The best solution will always be that which looks and feels good but with minimum intervention and loss of healthy tooth tissue.

DT Light Posts are availible direct from Dental 21 on 01245 237195 or www.dental21.co.uk ■

About the Author

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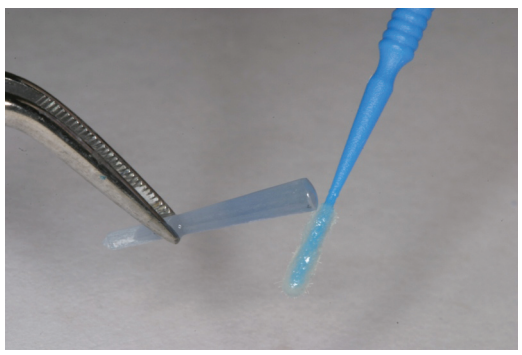

Top left: Coating the DT Light Post with Ultima Light Cured Adhesive
Top right: A radiograph of the DT Light Post in situ
Bottom left: The DT Light Post's colour disappears on placement in the tooth
Bottom right: The DT Light Post with trimmed core material.
Clinical photography kindly supplied by Dr Tony Pensak BSc. DDS. FACD.

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