

pathology (AP) enjoyed a 96% success rate^{17,18} whereas only 86% of the cases with pulpal necrosis and AP showed apical healing. Previously treated teeth with AP showed only a 62% success rate after re-treatment. Cross sectional examinations of populations around the world have demonstrated failure in 20% to 40% of root filled teeth.^{19,20} Teeth in which the restoration was defective but the root filling was adequate had a higher incidence of failure than teeth with inadequate root fillings and sound restorations. Teeth in which both the root fillings and restoration were adequate had only a 9% failure, whereas teeth where both were inadequate had an 82% failure.²¹

Tronstad¹⁷ was not alone in pointing out that endodontically treated teeth overall do not have a 100% success rate. In Kirkevange's paper²² 52.2% of endodontically treated teeth had apical pathology (AP) and **AP tended to increase with increasing age.** Hoen and Pink²³ reviewed 1,100 failing endodontically treated teeth and concluded that 65% of the cases demonstrated poor radiographic obturation quality and only 13% noted coronal leakage. Poor technical quality was a recurring theme in papers by Boucher²⁴ and De Moor.²⁵

If however, we accept the ultimate goal of endodontics as therapy to prevent or heal disease—as well as functional retention—and we apply the concept of evidence-based health care, then reviewing studies that provide the best evidence reveal that the chance of complete healing is reasonably high, and the chance for the tooth remaining asymptomatic and functional over time is excellent, provided that the tooth is promptly and well restored.^a

MOLAR TEETH

Unless a large percentage of coronal structure is missing, posts are rarely placed in molars. Work by

Nayyar and Walton²⁶ has clearly shown that a coronal-radicular core is close to 100% successful. Threaded pins have been advocated by Robbins, Christiansen and Kane in both a horizontal and vertical direction in addition to adhesive techniques due to the long-term concern for breakdown of the bond. If posts are required, they should be placed only in the largest canals—upper palatal and lower distal. Hachmeister et al²⁷ concluded that endodontic access through an existing complex amalgam, which is subsequently refilled, compromises the fracture strength of the original restoration.

After completion of the endodontic procedure, all the old amalgam and resin should be removed and replaced with either a bonded amalgam or resin.

ANTERIORES

Posts are used more often in the anterior (cuspid to cuspid) due to the shearing forces generated by the envelope of function. Custom cast and prefabricated metal posts do not provide increased fracture protection whereas carbon fiber posts have been tested both in vitro and vivo with differing results. Mannocci²⁸ et al suggest that the use of a resin based three steps adhesive system can be strongly recommended to obtain a strong link between composite cement, composite core, and the root canal walls. In an earlier study, Ferrari²⁹ suggests that a one-bottle system can also create a mechanical interlocking with the root etched dentin under clinical conditions. When quartz posts with composite cores and full coverage are compared to titanium, glass and zirconia with matching cores and crowns, the quartz shows significantly higher failure loads.³⁰

PREMOLARS

Post placement is based on the remaining coronal structure, the functional requirements of the tooth and an evaluation of the forces which will be acting on the

tooth. A post may be indicated if a premolar will function as an abutment for an RPD or suffers from an attachment loss. In a prospective in vivo study by Glazer⁸ failures in all but one tooth were premolars. *The canal anatomy of premolars is delicate and in order to succeed, the post system chosen must require minimal reshaping and enlargement of the canal space.*

POST DESIGN

Fanned by the work of Kantor, Pines,³¹ Trabert and Caputo³² it was tradition that every pulpless tooth received a dowel to reinforce it and a crown to protect it from fracture. However today most studies suggest that this is not the case. But even with literature saying the opposite, a survey in Sweden revealed that a high proportion of prosthodontists and GPs still believe that a post re-enforces.³³

TYPES OF POSTS

Custom cast

The custom cast post has a long history of clinical success but when compared to parallel prefabricated, both in vitro and in vivo, its superiority is questionable. There are circumstances where custom cast posts would still be the post of choice. These include medically compromised patients where reduced chair time is the imperative as well as multiple posts, restoration of small teeth and changes in angulations. *The greatest disadvantage of a cast post is the inability of the temporary post and crown to seal and prevent bacterial contamination of the root canal.*

Prefabricated posts

Passive tapered posts are less retentive but more conservative as they idealize the existing shape of the root canal. It is an excellent choice for premolars but needs longer length to make up for lack of parallelism. This tapered design works because the length is sufficient to provide axial retention with no canal enlargement.