Understanding e.max as the ideal material for indirect posterior and anterior restoration

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Posterior restorations are among the most frequently performed treatments in dentistry today, yet various challenges and limitations still exist in their execution. Whether for cases involving full coverage, partial, implant-supported, or aesthetic restorations, the process of selecting the appropriate material for indirect posterior treatments can be wrought with confusing information because the requisite demands may seem contradictory.

Among the considerations for posterior restorations are establishing proper isolation for adhesive cementation, ensuring fracture resistance of the selected restoration to achieve a good occlusion and great aesthetics, and resulting restorations used in posterior treatments. Additionally, aesthetics in posterior restorations has become an increasingly important consideration for both patient and clinician despite their location in less visible areas of the mouth. Shade and color matching between the restorative material and natural tooth structure is necessary for creating lifelike restorations. Combined, ideal anatomic form, marginal adaptation, and appropriate proximal contact and contour are required of materials and resulting restorations used in posterior treatments. High-strength allceramic materials are recommended for posterior restorations based on their strength. However, some have lacked aesthetics. Recently, non-ceramic materials have evolved to compete with ceramic in posterior restorations. The numerous indirect resin composites now available may perform well in certain clinical situations, but they still require further research to determine whether they are viable for long-term success.

Lithium disilicate
Lithium disilicate (e.max) is categorised as a glass-based ceramic. It is generally composed of quartz, lithium oxide, phosphorus oxide, alumina, potassium oxide, and other components. These powders are combined to make a glass melt that is moulded and then formed into blocks or ingots. The manufacturing process creates a highly thermal shock-resistant glass-ceramic due to the low thermal expansion that results during manufacturing. Within the material, needle-like crystals form and comprise about two-thirds of the volume.16 The ingots can be processed using the lost-wax hot pressing technique, whereas blocks are milled using the CAD/CAM technique. Lithium disilicate can be cemented using adhesive bonding (such as Multilink N Automix, Ivolcar Vivadent) or conventional cementation techniques.5 The monolithic property of e.max contributes to the strength and aesthetics of the restoration. The traditional use of a highstrength core material made of zirconia or alumina decreased aesthetics owing to the high value and increased opacity compared with glass-ceramic materials. Even though these high-strength core materials demonstrated excellent mechanical properties, the added layers of veneered ceramic, which have a much lower strength, caused the overall strength of the restoration to decrease. Lithium disilicate circumvents these problems and offers both overall strength and high aesthetics for an expanded range of indications other ceramics. e.max offers 560 MPa in strength, which is over twice the strength of other materials.
30 cases of dental trauma for five years, recording complications and responses to treatment. Root resorption was observed in 45 and responses to treatment. Root resorption, ankylosis and destruction is present and in which advanced periodontal disease is observed radiographically.

After six months, no root resorption or ankylosis was observed radiographically. Although the period of evaluation was short, the authors suggest that IR maybe an alternative approach to extraction in cases in which advanced periodontal destruction is present and no other treatment can be considered.

Among 14 mandibular molars, the success rate in first molars was 85.7%, and 71.4% in second molars. Of the four maxillary molars, three first molars and one second molar, one second molar first failed, resulting in a 66.7% success rate in first molars.2 Among the treated teeth, the success rate was 72% and 25% with follow-ups of between one to 22 years in posterior teeth.1,17 Benader and Rossmann40 reported a success rate of 77.8% in molars. Among 14 mandibular molars, the success rate in first molars was 85.7%, and 71.4% in second molars. Of the four maxillary molars, three first molars and one second molar, one second molar first failed, resulting in a 66.7% success rate in first molars.2 Among the treated teeth, the success rate was 72% and 25% with follow-ups of between one to 22 years in posterior teeth.1,17

Conclusion
For extraction and replantation to be successful, the following criteria must be met:

- Informed consent must be obtained from the patient.
- All roots need to be conically shaped.
- The teeth need to be somewhat mobile.
- A good knowledge of oral surgery is needed with respect to extraction.

Intentional replantation is a treatment alternative that should not be underrated, especially when conventional endodontic or surgical treatment is not possible. This is an excellent treatment with a predictable result, I have performed approximately 50 replantations, and have lost only one tooth to date.

In order to be successful with extraction and replantation cases, the practitioner must have the right patient and the right rapport with that patient. The practitioner must also be able to assess the tooth and be confident that it can be extracted without breakage. Additionally, the practitioner must be able to recognize tooth morphologies that may lead to extraction problems. This is a skill that is perfected through experience.

Replantation is a predictable and acceptable method of treatment in my office when patients present with root canals that require retreatment due to failure or those that cannot be completed owing to sclerosing of the canals.