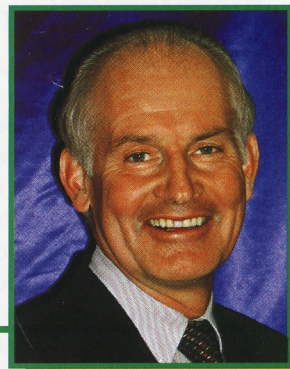


AESTHETIC Update



Compiled by Geoffrey M Knight

Minimal intervention slot preparations

Over the millennia, teeth have adapted to managing carious lesions so that progression is often slow and tooth damage is contained. The advent of the air rotor has dramatically increased pulpal response to the extent that tooth preparation can damage pulps more than the pre-existing lesion.

There is a need to review the manner in which dentists approach the removal of caries, particularly from proximal lesions where extensive tooth structure needs to be removed to gain access.

John McLean was talking about slot preparations in the early 80s. Although, it was a technique that didn't seem to take off, probably due to the difficulties in determining the extent of the lesion and uncertainties about complete caries removal.

Technologies such as KaVo's HealOzone, laser photo activated dye disinfection (PAD) and AgF/KI are emerging to treat caries in situ by disinfection and changing demineralized tooth structure to resist further caries attack.

With these technologies, access is still needed to the caries but complete caries removal may not be required, thus changing the whole dynamics of restorative dentistry.

CLINICAL CASE

The patient is a young adult male whose changing lifestyle had initiated a series of quite rapidly advancing carious lesions. Conventional access to the mesial lesion in 17 would have required removal of a large amount of healthy tooth structure and the distal inclination of the tooth challenged the standard tunnel preparation technique (Fig 1,2).

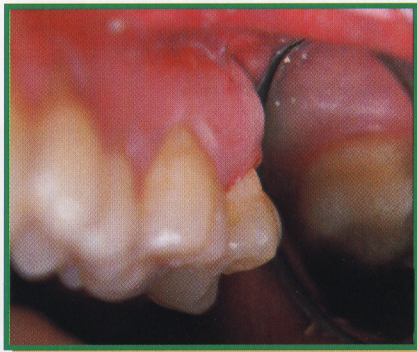


Fig 1. Mesial lesion on 17 requiring extensive tooth removal to gain access.

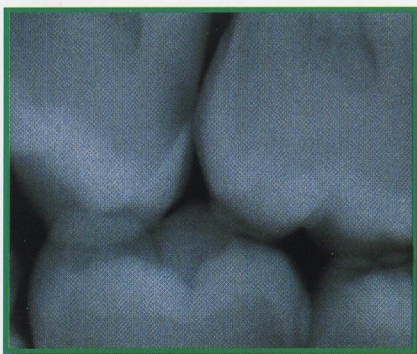


Fig 2. Radiograph of lesion.

Access was achieved using an end cutting high speed diamond, inclined in a slightly apical direction. The preparation had to be deep enough to avoid cutting the proximal surface of the adjacent tooth and preparation ceased when the operator's sensory

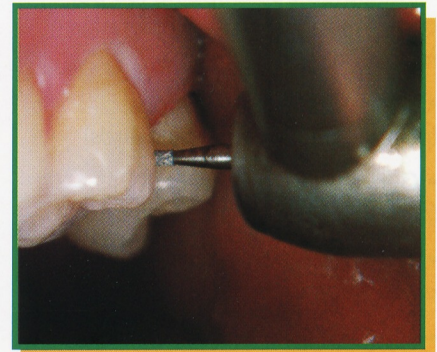


Fig 3. Initial access using high speed diamond bur.

perception of the bur recognized that the tip had reached the lesion (Fig 3).

This was followed by gentle preparation of the cavity using a #6 round steel bur, again relying upon the operator's tactile sensation of the lesion (Fig 4).



Fig 4. Further preparation using a slow speed #6 round steel bur.

Uncertain that all caries had been removed, the preparation was etched for five seconds with 35 per cent phosphoric acid, washed and dried. A solution of diammine silver fluoride (Saforide, Halas Dental) was placed into the preparation with a micro brush followed by several applications of potassium iodide (KI generic) to reduce the staining effects of the AgF. The preparation was flushed with water and dried with oil free air.

A stainless steel sectional matrix was placed into the interproximal space and lightly wedged from the facial and lingual to secure the matrix and prevent overhanging margins (Fig 5).



Fig 5. Sectional matrix secured with buccal and lingual wooden wedges.

A fast set capsulated glass ionomer cement (GIC) (Fuji IX, GC Corp; Ketac Molar, 3M ESPE; Riva, SDI) was placed to slightly overfill the preparation and allowed to set (Fig 6).

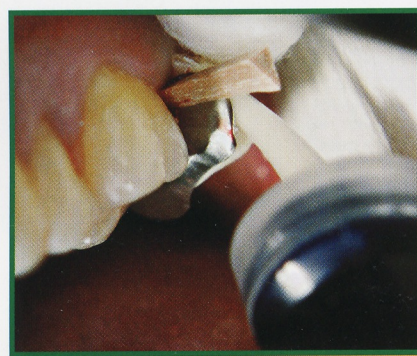


Fig 6. Placement of fast set GIC from capsule.

After setting, the matrix was removed and the GIC contoured to the tooth (Fig 7).

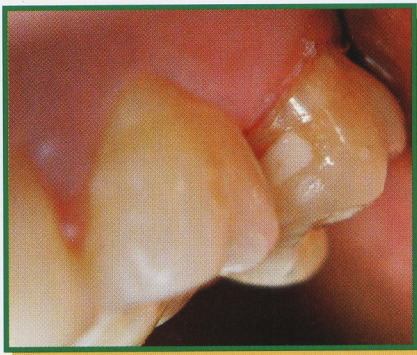


Fig 7. Inserted GIC restoration.

A radiograph of the completed restoration shows the GIC restoration in place, requiring much less tooth preparation than either a standard Class II preparation or tunnel preparation (Fig 8).

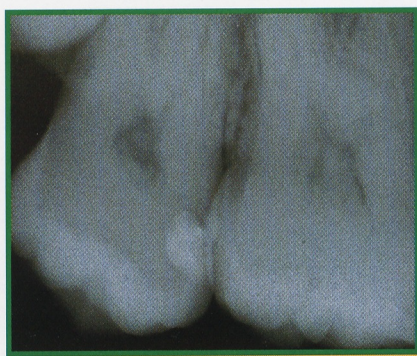


Fig 8. Radiograph of the completed restoration.

The trans-illuminated bicuspid shows a carious lesion in the proximal surface (Fig 9).



Fig 9. Trans-illuminated lesion on proximal surface.

“The next generation of dentists may wonder why it took today’s profession over 150 years to apply non surgical modalities to the management of caries” Dr Geoff Knight

Cutting a slot to the depth of the dentine enamel junction (DEJ) removes most of the caries (Fig 10). Treatment of the remaining caries with AgF/KI will disinfect the preparation and prevent caries developing at the restorative margins.

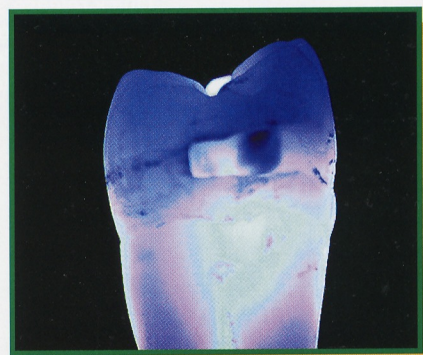


Fig 10. Caries remaining for AgF/KI treatment.

THE FUTURE

Over the last few years there has been an emerging interest in using a non surgical approach to the management of dental caries. It is early days but it clearly points to the future direction of caries’ management.

The next generation of dentists may wonder why it took today’s profession over 150 years to apply non surgical modalities to the management of caries and no doubt somewhat confused why we found it necessary to remove healthy tooth structure to achieve temporary changes in oral cosmetics.

“With these technologies...complete caries removal may not be required, thus changing the whole dynamics of restorative dentistry.” Dr Geoff Knight