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THE COMMERCIAL CASE for minimal intervention dentistry

Mark Twain once said that everyone talks about the weather but nobody ever does anything about it. These days there seems to be more talk about the weather than ever before. There is broad agreement on a link between carbon dioxide and climate change but, nevertheless, few wind farms or solar energy plants are presently under construction.

In dentistry, there is general agreement on the philosophy of minimal intervention (MI). Most dentists identify themselves as practitioners and, whenever possible, lecturers point to how their procedures conform to MI principles. It has virtually become a modern paradigm.

In reality, though, minimal intervention dentistry is usually endorsed more as a high minded aspiration than a raft of techniques suitable for busy general practice. When faced with mesial or distal decay, most of us still cut proximal ridges and enamel walls and we routinely remove caries affected dentine close to vulnerable pulps. Everyone speaks politely about MI dentistry but, like the building of wind farms, not a great deal is actually being done.

There are a number of reasons. Paradoxically one is that MI dentistry involves little capital outlay and, in many cases, little special expertise. Browse through a commercial dental magazine or even just open the daily mail and one is inundated with advertisements for expensive equipment and training courses. Technologies such as CAD/CAMs and implants are exotic and exciting. While they are costly to bring to the profession they also involve high profit margins for manufacturers and retailers and accordingly are heavily marketed. They can easily be perceived as the essence of modern dentistry.

In most cases, this type of *high intervention* is usually the latest in a long series of treatments which have failed to arrest deterioration. Graeme Mount¹ wrote recently, "As suggested by GV Black, operative dentistry must begin with cariology and it is essential that it again become the dominant discipline in the profession." Advanced technology is applaudable but its glamour and promotion can distract from the basics of treating primary caries.

APROXIMAL DECAY

It is widely accepted that many of Black's teachings have been superseded. In a post fluoridation era fissures are rarely drilled out and, when adhesive materials are being used, undercuts are not deliberately prepared. However, the approach to, for



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beveling of the enamel margins. They wrote "It is reasonable to expect that if the source of nutrition for the cariogenic bacteria could be eliminated; the organisms would die, thus arresting the caries process." After a decade the sealed 'restorations' performed as well as the amalgams and "arrested the progress of the lesions."

It would seem that the situation with sealed, *residual* decay is very different from that of *recurrent* decay. The latter is often linked to pulpal damage and is usually associated with poorly sealed margins that leak both bacteria and nutrient. Very often deep preparations have already exposed millions of tubules, opening up pathways to the pulp for microbial byproducts.

So, is it essential to remove all decay, especially when it is deep and approaching the pulp? Some authorities advocate removing only gross and peripheral caries, particularly at the enamel-dentino junction (indirect pulp capping). The remaining softened dentine is sealed with GIC and serves as a protective mat over the pulp.

This strategy of inactivating microbes has an analogy with the advice dentists give their patients about controlling the bacteria in plaque – their number will inevitably drop if they are deprived of substrate (food debris).

A MEDICINAL APPROACH

Perhaps eliminating bacteria should not be seen as synonymous with physically excising them, together with their housing of dentine. Treating decay *medicinally* rather than *surgically* may be another viable alternative and not lead to complications such as mechanical weakening and pulpal trauma.

In the late 1970s Graham Craig⁶ used ammoniated silver fluoride topically to manage gross decay in deciduous molars. After two years 74 per cent of the cavities had not progressed.

Silver fluoride stimulates remineralization and is intensely bactericidal. Silver ions are lethal to *Streptococcus mutans* at concentrations of 20-200 ppm, while a 40 per cent silver fluoride solution achieves levels of 3,000-12,000 ppm.

A potential complication of AgF is its unsightly staining of surrounding enamel. Craig has suggested that, when used on a cavity of prepared carious dentine, its application should immediately be followed by that of potassium iodide. Staining is avoided because the resultant precipitate of silver iodide is yellow-white rather than black. *In vitro* studies have confirmed that AgF and KI, used in combination, inhibit both caries progression and demineralization.

Silver fluoride has great potential. It has been used intermittently for many years in the 'atraumatic restorative technique' (ART) for deciduous teeth, but it also has broad application for treating permanent teeth.

When deep decay is being managed and the clinician seeks to limit the extent of preparation, it can almost immediately disinfect the surface of exposed dentine. When approximal caries is being treated, it compliments the internal preparation by disinfecting caulky, porous enamel and stimulating remineralization. Used in conjunction with GIC, it would appear there may be the capacity to both kill cariogenic bacteria and seal the dentine in otherwise deep preparations.

THE BOTTOM LINE

The clinical case for minimal intervention dentistry should be compelling but it has failed to significantly alter day-to-day practice. Too often it is seen as impractical and finicky and more suited to academics than general practitioners aiming to run a successful business. Marketing executives might say it has an image problem.

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Occasionally, its promotion lacks conviction. A few years ago, one researcher⁷ wrote in the *News Bulletin* about the "demanding nature" of the internal restoration and commented "it requires excellent lighting, magnification aids and good visual access." This does the restoration a disservice because it is, in fact, much easier to perform than a traditional Class II filling.

More than anything, though, work practices are difficult to alter because they become engrained. Techniques that are familiar instil ease and confidence; new approaches are awkward and daunting. It takes quite an incentive to bring about change.

If the clinical argument has faltered perhaps the commercial case may prove more appealing. The reasoning is straightforward.

Profitability depends largely on efficiency. Treating caries remains a major part of any practice and, if it can be accomplished smoothly and quickly, the number of units performed per hour can rise significantly.

Minimal intervention dentistry is certainly efficient. Occlusal cavities require less depth of preparation. Most approximal lesions do not need enamel walls and ridges removed and matrices need not be placed. The time taken for shaping and polishing is reduced markedly.

In addition, less preparation leads to fewer incidences of sensitivity and pulpal complications. When any restoration precipitates a need for endodontic treatment, credibility can unfairly be undermined, irrespective of the original decay's depth. It goes without saying that patient flow and perceived credibility are closely related.

Back in 2004 the respected British academic Edwina Kidd⁸ wrote in a landmark paper "The concept of removing infected, demineralized tissue and its replacement by a filling material has spawned a profession, a public and political paymasters who consider that removing infected tissue and filling teeth is an essential management of dental caries."

Some time earlier this particular author had waited patiently for the paymaster to forward on his cheque. It never arrived in the mail. He eventually decided it was better for his patients' dental health, and better for his cash flow, to adopt a more minimal intervention style of dentistry.

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REFERENCES

References supplied by the author are available by emailing newsbull@ada.org.au