

# Secondary Caries, A Problem of Primary Concern

These are some of the thoughts that surfaced while I was reviewing a thesis that focused on instruments to detect caries, and specifically, secondary caries. By common usage, the term “secondary caries” indicates those lesions occurring at the margins of existing restorations. A review of the literature should prompt dismay among clinicians, since the frequency of restoration replacement appears to be based primarily on this phenomenon, and the occurrence seems to be accelerating rapidly during recent years. Despite improvements in restorative materials and techniques, the longevity of our restorations appears to be decreasing at an alarming rate, and patients, insurance companies and health care professionals seem to be tacitly accepting of this trend.

The frequency of publications related to secondary caries has increased almost exponentially during the last two-plus decades, which suggests that the clinical problem has become much more compelling. However, the focus of the majority of the research deals with means of detecting the problem at an early stage, rather than determining the causative factors and possible solutions to prevent the problem. While the development of early caries detection methods is laudable and should be pursued, the fact that secondary caries is such a recognized factor in restoration replacement deserves our attention as well.

The occurrence of secondary caries appears to be most prevalent at the cervical margins of restorations. This suggests that, while our restorative materials and techniques may be acceptable at readily accessible cavosurface areas, they are somehow lacking at gingival margins. It may also suggest that the technical details of our hard tissue surgical intervention are not as precise as may be required for minimizing this problem. Even as I write this, I am supervising a Class II cavity preparation by a graduate student, and we are trying to take precautions to minimize the possibility of secondary caries at the cervical margins. This includes good isola-

tion for visibility, optical magnification and the use of sharp hand instruments to insure that all cavosurface margins are as defined as possible.

One of the major impacts of high-speed rotary instrumentation and adhesive dentistry has been, in my opinion, a marked reduction in the use of hand instrumentation. While some of this may be appropriate, studies showing the shattering effect of a bur at high-speed on enamel margins seem to be forgotten. The fact that this effect is most noticeable as the bur exits the preparation at a cavosurface margin begs the question, is this rough, crazed surface really the best margin ... even for adhesive restorations? Will polymerization shrinkage and thermal stresses eventually compromise the marginal seal and allow bacterial ingress? Can we adapt non-adhesive materials (amalgam, cast metals, etc) adequately to insure margin closure at a microscopic level? Would we not serve our patients' long-term health better by delivering the best fitting restorations possible, including taking the time and effort to refine our margins to the best of our ability?

Another aspect of good restorative dentistry that is often overlooked with excuses, including it takes too much time, is too difficult to do or is not really necessary, is the appropriate isolation of the operating field. There is no doubt that the cervical margin is frequently the most difficult to visualize due to the approximation of the gingival tissues and, often, the presence of tissue fluids and hemorrhage. Dentistry done by “feel” alone cannot be considered adequate, and any attempt to achieve adhesive bonding in a contaminated environment is wishful thinking at best. The ability to actually see whether or not the enamel or dentin is sound and that no decalcification remains requires a clean, dry field that can be maintained for more than a few seconds. While leaving affected (and even infected) dentin over the pulp has been shown to be a reasonable procedure if a good marginal seal is maintained, it is not acceptable to leave any disease process at a margin.

Proper isolation insures that inadequate removal of primary caries is not labeled secondary caries in the future.

Along with isolation, optical magnification helps us to visualize our preparations in much greater detail than that allowed by the unaided eye. With this technology, we are able to see that our preparations meet all the requirements of caries removal and operating finesse. If all restorations were placed with a near perfect tooth interface, what would be the impact on the occurrence of secondary caries?

Finally, we must accept the fact that operator skill, good knowledge of the advantages and disadvantages of all the restorative materials in our armamentarium and constant attention to detail have a tremendous impact on the quality and longevity of the care we provide our patients. While it is easier to blame our restorative failures on our patients' lack of cooperation or inadequate home care, our dental materials and their manufacturers, and even our heavy work load, in reality, we must shoulder the ultimate responsibility for our successes and failures. It is a difficult burden to bear, since we are all human and prone to error even when our intentions are honorable. The human factor makes the delivery of quality healthcare a demanding ideal.

These ideas remind us that we are expected to be very discerning in the minute details of our operative work. Also, it is a fact of our life that, being careful will diminish some of the undesirable effects but not likely eliminate them. As a teacher, I must ask myself the final question ... is the training of our dental students in the areas of ethical responsibility as well as all the technical aspects of restorative dentistry adequate and appro-



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priate? The balance between the business and financial part of dentistry and our major role as quality health-care providers must not tip in the wrong direction. Convenience and cosmetics must not replicate clinical longevity. Our intentions may be the best, but reality suggests that there is ample room for improvement.

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