The advantages of minimally invasive dentistry

In my opinion, during the past several years, there has been an obvious trend in dentistry toward complex techniques and accomplishing more treatment than required. The trend has been mentioned to me many times by colleagues as I have traveled around the world.

Recently, I had the opportunity to speak at the annual meeting of the World Congress of Minimally Invasive Dentistry. It was refreshing to be with a group of fellow practitioners who were attempting to provide optimum services for patients with the minimum amount of treatment. Some have misinterpreted the objectives of minimally invasive dentistry by assuming that the practitioners in this organization are interested only in pits and fissures, sealants and simple procedures. Instead, the group is interested in promoting optimum, minimally invasive treatment for patients in all areas and specialties of dentistry.

The experience motivated me to write this article aimed at identifying examples of minimally invasive procedures in many areas of dentistry, with the hope that readers will consider performing more minimally invasive procedures in their own practices.

EXAMPLES OF MINIMALLY INVASIVE ORAL PROCEDURES

Sealants. Properly placed sealants do not require any cutting of tooth structure. Placement of sealants in suspect teeth within six months of tooth eruption is highly effective in preventing the need for future tooth restoration or potential tooth removal at a later time. I suggest that grooves and fissures should be cleaned with air slurry polishers before placement of sealant material to ensure that plaque has been removed from the grooves.

Placement of preventive resin restorations using small burs or air abrasion. When teeth appear to have minimal dental caries in them, and this suspicion has been verified by using a caries detection device, such as DIAGNOdent (KaVo, Lake Zurich, Ill.) or DIFOTI (Electro-Optical Sciences, Irvington, N.Y.), this situation allows minimal tooth structure removal and optimum small restorations.[1]

Miniature implants versus standard-size implants. Often, patients do not have the minimum six millimeters of bone in a facial-lingual dimension needed for placement of conventional 4-mm–diameter implants. The use of "mini" 1.8-mm–diameter implants allows conservative placement of implants in bone that is only

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3 mm thick in a facial-lingual dimension, thus avoiding bone grafting and significant trauma and expense for patients. Placement of these small-diameter implants in multiples should be considered for optimum resistance and retention of fixed or removable prostheses. One widely used brand of mini-implants is IMTEC Sendax MDI (IMTEC, Ardmore, Pa.); another brand is MTI Monorail System (Dentatus, New York). Mini-implants' minimal cost and ease of placement make them desirable to patients and dentists.[2]

Conservative periodontal therapy. In recent years, I have noticed a decline in interest in periodontal therapy among general practitioners. I have been told that this trend also has been observed by the community of periodontists among their own colleagues. It appears that some periodontists are more interested in placing implants than doing periodontal therapy. In my polling of continuing education audiences, I have found that most general dentists are not doing periodontal therapy.

Dental hygienists easily can treat patients who have moderate periodontal disease by means of frequent visits for scaling and polishing, antibiological rinses, local and systemic antibiotics prescribed by dentists, tongue cleaning and increased patient education. For selected patients, this conservative approach retains teeth without the trauma of conventional periodontal therapy or the inevitable tooth extraction required if periodontal disease is allowed to go without treatment.[3,4]

Placement of inlays and onlays instead of crowns. Most dentists restore teeth with crowns instead of tooth-colored or gold alloy inlays and onlays. The apparent reason is that the crown procedure is believed to be simpler and more predictable than the inlay or onlay procedure. Also, some third-party payers fund crowns more fully than they do inlays and onlays, which is unfortunate.

I contend that, in the hands of an experienced practitioner, inlays and onlays can be easily placed, predictable, long-lasting and minimally invasive. Additionally, as gingival tissues recede around inlays and onlays, the gingival portions of the restored teeth have their original color and anatomy, thereby providing the potential for a more optimal esthetic result over the long term.[5]

Bleaching or placement of veneers instead of crowns. In many situations, teeth that are acceptable in anatomy and occlusion but are discolored receive crowns instead of the more conservative tooth bleaching or veneer placement. Crowns are invasive. They hold a potential threat to tooth vitality. They require replacement after only a few years, and in most practices they seldom simulate natural teeth on a long-term basis.[6,7]

Occlusal splints instead of full-mouth reconstruction. Occlusion often is forgotten in dental practice. Every dentist sees the teeth of bruxers or clenchers worn nearly to the gingival tissue in patients who are 30 or 40 years of age. These destructive habits are observable easily in the late teenage years. Placement of occlusal splints to be worn at night and in times of stress can prevent the invasive, destructive and expensive placement of crowns just a few years later.[8]

Removal of third molars at the most opportune time. If third molars are extracted at the correct time, their removal is simple and relatively atraumatic. If they are removed earlier than the optimal time, the procedure is difficult, because bone surrounds the tooth, and if they are allowed to develop fully—including total root structure—they can be extremely difficult to remove.[9] The time to remove them is when the third molar is perceived to be unable to move into proper position because of anatomical limitations, and it has erupted to the level that the occlusal surface is about one-half of the way in an occlusal direction from the distal cementoenamel junction of the second molar. The root ends still are not fully formed at this point. The periodontal ligament space is about 0.25 mm wide, and the follicle surrounding the tooth still is about 2 mm wide. These conditions that allow minimally invasive third-molar removal usually exist between the ages of 16 and 19 years.

Preventive therapy for patients undergoing orthodontic treatment. In recent years, dentists practicing orthodontics have moved from use of zinc phosphate or glass ionomer cement containing fluoride to use of resin cement "with fluoride added." Although it is possible to develop resin cements that release a slight amount of fluoride during service, this release is minimal compared with that of the cements of the past. The result is a well-known epidemic of demineralized white spots or overt dental caries in patients whose orthodontic work is completed. High-level fluoride

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toothpastes such as Prevident 5000 (Colgate, Canton, Ohio), Fluoridex (Discus Dental, Culver City, Calif.) or Control R_x (Omnii, West Palm Beach, Fla.) can reduce or eliminate this problem. The fluoride toothpaste is applied twice per day, after breakfast and before retiring, to the teeth undergoing orthodontic therapy. Patients who use these high-fluoride toothpastes have fewer invasive carious lesions after orthodontic therapy.

Digital radiography versus conventional radiography. Many dentists have changed to digital radiography, but numerous practitioners still are using standard radiography. Digital radiography reduces the amount of radiation dental patients receive by at least 80 percent, with the obvious advantages of less cumulative radiation exposure during therapy.[10]

Repair of crowns instead of replacement. Over many years of service, the gingival margins of full crowns begin to develop carious lesions. When these crowns are in the posterior portion of the mouth and do not require an optimal esthetic result, repair of margins is indicated. Easily placed, high-fluoride–releasing restorative materials are recommended for the repair. Fuji II LC (GC America, Alsip, Ill.) or Vitremer Restorative Material (3M ESPE, St. Paul, Minn.) are excellent materials for such repairs. Many repaired crowns continue to serve for decades when this minimally invasive repair technique is used.

WHAT ARE THE EFFECTS OF MINIMALLY INVASIVE DENTISTRY?

I have discussed only a few of the many potential minimally invasive dental therapies. Embracing the concept of minimally invasive dentistry and implementing it in practice creates some changes.

I have observed that patients are impressed with a conservative orientation in their dentists. When dentists offer alternatives for treatment rather than just the "highest level," patients see that their dentist is concerned about them, rather than being promoters of the highest-cost therapy. Such dentists can truthfully say, "If I were you, and I had your oral condition, I would do the following." Practitioners know that they are preserving dentitions and supporting structures, instead of merely selecting the easiest or most expensive alternative, and patients appreciate this.

Is the dentist's income influenced detrimentally by the practice of minimally invasive dentistry? It is apparent that some of the minimally invasive procedures have the potential to reduce a dentist's income; however, that effect may be avoided by having dental staff members perform many of the conservative procedures (where such activity is legal).[11,12] Increasing office efficiency and organization also allows more procedures to be accomplished in a given period.

SUMMARY

Minimally invasive dentistry, in cases in which it is appropriate, is a concept that preserves dentitions and supporting structures. In this column, I have discussed several examples of minimally invasive dental techniques. This type of dentistry is gratifying for dentists and appreciated by patients. If more dentists would practice it, the dental profession could enhance the public's perception of its honesty and increase its professionalism as well. ■

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The views expressed are those of the author and do not necessarily reflect the opinions or official policies of the American Dental Association.

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