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Practicing Esthetic Dentistry for the New Millennium

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We have seen an explosion of new technology in the past decade. The whole world seems to be in fast forward getting ready to meet the requirements for the new millennium. The public expects high-technology to be incorporated into all types of services, from industry and education to home life and health care -- every facet of life.

Dentistry too has benefitted from the high-tech revolution. The old days of a single dentist meeting just the functional needs of a patient are gone. Limiting the available services to only what the patient needs is not acceptable today. Rather, the dentist must help a patient recognize what he or she wants -- both functionally and esthetically -- and then consider enlisting the help of a specialist to reach the goal set by the patient and dentist together.

Dentistry today varies considerably ranging from countries which are primarily giving only basic care consisting of extractions and amalgam restorations, to sophisticated state-of-the-art high-tech dental practices providing the most advanced techniques available -- described as esthetic restorative and proactive care. The United States has seen an emergence in the past decade of dental practices that have evolved from

providing only traditional and basic dental care to up-to-date operatories with high-tech equipment and a highly trained dentist.

The public is now almost demanding that any new office opening should have virtually all of the high-tech equipment and services available for patient care.

Effect of the Media

Whereas dentistry has been lagging in changing to the high-tech approach, in many countries the media has driven the public to demand high-tech diagnostic and treatment care. However it is my estimate that 70% of the offices still have a great distance to go before attaining total renovation or providing the basic high-tech care that should be considered standard dental care today.

One of the problems with offices converting to a high-tech office, is the inability of technology and dental equipment to be totally integrated. This no doubt will be the future of dentistry. Stand alone high-tech systems, whether it be esthetic imaging, an intraoral camera, air-abrasive technology, digital radiography, lasers or any of the others, will all be totally integrated in the future.

The problem that many dentists face is: Should I wait until these systems are totally integrated, or should my practice begin to incorporate the technologies currently

available? The answer to the question seems to be based on the practice=s patients. In other words, certain types of patients are demanding more high-tech services than other groups of patients. Dentists should seek to meet the expectations and demands of the majority of his or her patients. Certainly this is true in the United States, and that is the reason why the inclusion of stand-alone systems has been the rule rather than the exception.

Office Management Systems

Fortunately today, most computerized management systems integrate several systems needed for quality patient care. They help offices schedule patient procedures, are a database of patient information -- both related to treatment and finances -- and integrate treatment systems such as intraoral photography and computerized radiography. A smaller number of offices add imaging capabilities to their system. This makes it possible to e-mail an x-ray or other patient record from dentist to dentist. When the two dentists both possess the same capacity of technology, communication is much easier and more accurate.

Perhaps the one thing that is not meeting dental patients= expectations in the new millennium are total office and operator design. Most dentists are still utilizing the same basic operator units and chairs over the past several decades. New implementations will improve the dentist=s posture, the lighting in the operatory, communication between the patient and dental team, and the length of time required for different

procedures. Certainly this will change in the future.

The Future: Information Transfer

Within the first decade of the new millennium information transfer will be at an accelerated rate that can only be dreamed about today. The way we communicate with each other -- between the patient, general dentist, specialist, auxiliaries, laboratory technician and, in fact, the entire esthetic team -- will be instantaneous. Imaging patients will become standard, and every practitioner will be able to contribute immediately to the diagnosis and treatment plan. Meeting the overall objective will be more coordinated -- optimizing effort from both patient and therapist.

Esthetic Imaging

It is not unreasonable to predict that within the near future patients will expect to see their image computerized so that the planned esthetic changes can be visualized by them and whomever they wish to help govern their esthetic decisions. Eventually such images will be holographic so three-dimensional changes will be easily predicted and mutually understood by both patient and the dental team. Patients have a right to know how their smile and face may be affected by cosmetic changes, whether it is through dentistry, plastic surgery, dermatology, etc. In past years, many practitioners were charged with malpractice claims, due to misunderstanding and unmet expectations related to projected images. This is not the case today. The computerized image serves as a model or visual illustration which both parties are trying to achieve; it

certainly does not guarantee a result nor should it be interpreted as a promise.

However, the importance of both patient and dentist looking at the same image from the same angle assures that tooth form, shape, artistic arrangement and even to some extent color or shade is an agreeable objective.

One of the most significant benefits of esthetic imaging has been the ability to show patients how their smile would look with gingival changes. Patients who show too much gum tissue when smiling, have extreme difficulty visualizing how their smile or face will look after tissue raising procedures are completed. The teeth-to-face proportion can change drastically and this change must be shown to patients before such alterations are begun.

The facial effects of moving upper teeth lingually can cause undue emphasis on the middle part of the face, therefore making the nose appear more prominent. Only through viewing proposed images can the patient and practitioner together determine if dental alteration alone is desired or if plastic surgery should be included to complete the esthetic transformation.

Diagnosis in The New Millennium

The diagnostic phase of patient care will see a giant step forward when computer programs are implemented that will greatly enhance the proactive status of patient care.

This means that not only will facial and intraoral lesions be much easier to detect and

predict, but even the aging of the face will be mapped out to the point where patients will be advised when and how to intervene to obtain optimum esthetic appearance throughout their lives. As holographic projections become possible, new ways to look at facial appearance procedures will not only become easier to forecast but patients will obtain a more secure blueprint for longer lasting facial appearance. Indeed the future of esthetic dentistry becomes even more important in the scheme of overall facial appearance. This understanding and acceptance of the role dentistry plays will help move all of the appearance-related specialities into new territory.

Interdisciplinary Therapy

Dentistry of the future will be total patient care utilizing interdisciplinary therapy. This means a diagnostic approach based on all of the options available to help make patients look as good as possible, meeting their expectations and desires, as well as their needs.

We have been practicing this type of therapy since long before I authored my first textbook, *Esthetics In Dentistry* (1976, J. B. Lippincott) and wrote about interdisciplinary therapy. We have had close working relationships with virtually all of the specialities, but especially those in orthodontics, periodontics, oral surgery and endodontics. For the past eight years we have had prosthodontic, periodontic, and orthodontic specialists treating patients within our own office. So when we diagnose a new patient, usually a specialist=s perspective is included in the diagnosis. In addition the laboratory

technician plays a vital part in treatment planning.

The patient pictured in Figure 1 presented desiring simple replacement of her anterior crowns. It is not too difficult to see that it would have been impossible to achieve the end result she now enjoys if we had just met her initial request.

Indeed, thoroughly educating the patient before the patient appears for treatment with a consumer guide, such as *Change Your Smile*, helps the patient understand that what may seem simple is in fact many times more complex, and requires an interdisciplinary approach. This has been extremely helpful in informing patients of potential treatment choices, advantages and disadvantages of each treatment, life expectancy of a restoration, maintenance expected, and most important, a realistic fee range.

Video Exam

Standard diagnosis in my dental practice today includes not only clinical examination with mirror and explorer, but also a video exam,[≡] consisting of an intraoral camera or stereo microscope and letting the patient view every tooth surface on the monitor as I see it. This diagnosis permits transillumination, which is invaluable in diagnosing microcracks, especially in areas of marginal ridge or facial cusps, which may well change the treatment approach to a particular tooth. This converts my diagnosis from being reactive to being proactive, and may prevent more potentially serious fractures from ever happening. It also allows me to alert the patient to early problem

development in their mouth that neither of us would have been aware of without the intraoral camera.

Ultimately it becomes the patient's choice whether or not to restore these areas, but at least he or she can become much more careful in the selection of food and caution in biting. For instance, if a patient was not aware of a mesial or distal microcrack, and bit down on a raspberry, the biting of a tiny seed in that microcrack area could result in a vertical fracture and potential tooth loss. From what seemingly was a simple, everyday act of mastication could have occurred an almost predictable act.

By being prognosticators and saviors of one's dentition will not only make us much more valuable diagnosticians, but also should continue to raise the status of dentistry in the eye of our patients. Anytime we can predict and perhaps prevent an accident from happening, we are doing our best work, and certainly one which patients will ultimately appreciate.

Summary

For the past 40 years I have tried to provide my patients with the finest dentistry possible. To accomplish this has made it necessary to include the valuable input of virtually all the dental, and many medical, specialties and technologies.

The dawn of the new millennium should serve as a challenge to all of us to update not

only our offices to current technology, but also our minds to be receptive to the challenges of the future.

LEGENDS

Figure 1. Before smile of a 53-year-old lady who thought she could improve her appearance by simply replacing her 4 upper anterior crowns. Note excessive gingiva, multiple shades, and eroded, chipped, crowded lower anterior teeth.

Figure 2. Retracted view reveals irregular crown length.

- Figure 3. Periodontal crown lengthening was done by periodontist team member Dr. Maurice Salama.
- Figure 4. Note tissue healing with more favorable gingival height and contour.
- Figure 5. The lower anteriors were cosmetically contoured and bonded.
- Figure 6. Posterior composite resins were chosen for the most conservative approach. Note special total access E.T. burs being used because of limited opening.
- Figure 7. The total access finishing system (Brasseler/Komet).
- Figure 8. Note the different number of shapes and sizes plus the short shank advantage provided by the Total Access System.
- Figure 9. Next the teeth were prepared, impressions made and these temporary restorations constructed.
- Figure 10. The patient can now visualize how she will look with the newly fabricated, lighter colored temporaries.
- Figure 11. Since the technician wanted to pull in the buccal aspect of the lower

bicuspid tooth preparations, he constructed a metal coping which could help identify the amount of reduction to be done on the model.

Figure 12. Note the protruding buccal aspect to be reduced.

Figure 13. The coping permits accomplishing a precise amount of reduction using a 30 micron OS1 ET diamond (Brasseler/Komet).

Figure 14. Now the teeth in the mouth are exactly as the altered dies in the laboratory, so no time was lost, nor no new impressions were made.

Figure 15. Dr. Ronald Goldstein and Pinhas Adar view the patient. Note the overhead television monitor, which permits the patient to see herself as well.

Figure 16. The laminates on the first molar and cuspids were seated first.

Figure 17. Next the upper bicuspids were glazed and cemented in place with a resin cement (Vitremer, 3M).

Figure 18. Before seating the anterior crowns, a diode laser was used to remove some excess tissue.

- Figure 19. Air-abrasive was next used to remove the shine from the gold post core build-ups, since all ceramic crowns were constructed for these teeth.
- Figure 20. Vitremer cement (3M) provides fluoride release and a good resin seal.
- Figure 21. The 4 anterior Procera (Nobel BioCare) crowns were seated with careful pressure, holding the crowns in place using resin cement (Vitremer).
- Figure 22. BEFORE -- Lower arch showing the erosion on the anterior incisal edge as well as a defective amalgam and crown.
- Figure 23. AFTER -- Lower arch showing a conservative approach of cosmetic contour, bonding and crowns, keeping the well-fitting gold restorations which improves the form and color of the remaining teeth.
- Figure 24. The occlusal view of the upper arch shows the porcelain laminates on both cuspids and first molars preserving the enamel of these teeth.
- Figure 25. The right side before shows how unattractive the smile was.
- Figure 26. Note the total improvement in the right aspect of the smile.
- Figure 27. The left lateral view shows how asymmetrical and noticeable the left

lateral was to the smile.

Figure 28. New tissue levels plus better color and more attractive crowns and laminates made for a much more attractive smile.

Figure 29. Close-up of healthy tissue proves how well fitting crown margins are essential for proper function.

Figure 30. This labial view identifies how crowded and worn the lower anteriors were in addition to the unattractive maxillary teeth. The incisal views of the before picture also point out how crowded the teeth were.

Figure 31. A-year-and-a-2 later shows how well the new smile is doing.

Figure 32. Close-up view of the poorly fitting crowns.

Figure 33. The new ceramics by ceramist Pinhas Adar helped provide a much better look.

Figure 34. The final smile can be compared to the first photograph to see the dramatic result.

Figure 35. This shows a beautiful woman whose result was made possible by interdisciplinary therapy rather than simply meeting the patient's original request of replacing 4 crowns. Her self-image has greatly improved.

REFERENCES

Goldstein CE, Goldstein RE, Garber DA. Esthetic imaging in dentistry. Chicago: Quintessence, 1997.

Goldstein CE, Goldstein RE, Garber DA. Computer imaging: an aid to treatment planning. Journal of the California Dental Association 1991; 19 (3): 47-51.

Goldstein RE. Esthetics in dentistry. Hamilton, Ontario; B C Decker 1998; second edition, Vol 1.

Goldstein RE. Change your smile. Chicago; Quintessence 1997.

Goldstein RE. Communicating esthetics. N Y State Dent J 1985; 51; 77-9.

Goldstein RE. Current concepts in esthetic treatment. Proceedings of the Second International Prosthodontic Congress 1979: 310-2.

Goldstein RE. Study of need for esthetics in dentistry. Journal of Prosthetic Dentistry 1969; 21: 589.

Goldstein RE. The difficult patient stress syndrome: Part 1. Journal of Esthetic Dentistry 1993; 5; 86-7.

Goldstein RE. Esthetic dentistry -- a health service? Journal of Dental Research 1993; 641-2.

Goldstein RE, Miller MC. High technology in esthetic dentistry. Current Opinions in Cosmetic Dentistry 1993; 5-11.

Goldstein RE, Garber DA. A Δ gap \cong in our understanding . . . why those who can don't seek esthetic treatment. Journal of Esthetic Dentistry 1996; 8:99.

Goldstein RE, et al. The changing esthetic dental practice. Journal of the American Dental Association 1994; 125: 1447-57.

Goldstein RE, Lancaster JS. Survey of patient attitudes toward current esthetic

procedures. *Journal of Prosthetic Dentistry* 1984; 52: 775-80.

Goldstein RE. Ronald E. Goldstein talks about esthetic care (interview by Lawrence Meskin). *Journal of the American Dental Association* 1991; 122 (4): 32-6.

Goldstein RE. Ronald E. Goldstein talks about esthetic care (interview by Lawrence Meskin). *Journal of the American Dental Association* 1991; 122 (3): 34-7.

Goldstein RE. Ronald E. Goldstein talks about esthetic care (interview by Lawrence Meskin). *Journal of the American Dental Association* 1991; 122 (2): 36-41.

Voss R. Problem of treatment according to the patient's wishes. *ZWR* 1971; 80: 557.