

Personal Oral Hygiene; A Serious Deficiency in Dental Education

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EVERY person needs to keep his or her natural teeth healthy and normally functional throughout a potentially long life time. No one does now. The necessary information is not available at the present time; even to those who need it, want it and would follow it.

The incidence and the rate of advancement of the lesions of both caries and periodontoclosia—the principal diseases affecting the teeth and their related tissues—are influenced largely by the very variable personal oral hygiene practices of each different individual. Even inadequate or inappropriate methods of home care of the teeth usually do some good, but complete prevention and control can be achieved only by application of the necessary effective method.^{1, 2} In the light of the facts as to the local etiological and pathological conditions in each of these two diseases, they can not be entirely prevented unless this particular method of personal oral hygiene is followed. It differs substantially from, and in vital particulars it is quite the opposite of, methods generally advocated³ and followed.

If the above statements are true, and I am prepared to substantiate them to the entire satisfaction of any competent person who is willing to make the necessary investigation, then countless millions of the American people every day have active, advancing, ultimately destructive dental disease which could be prevented if they could have, and would follow the

necessary correct information relative to personal oral hygiene.

People rely upon the dental profession for information relative to their dental health. For the most part they seek and receive treatment of disease and repair of damage that has already taken place. They do not know or realize that such disease damage could have been prevented. More important, at the moment, they do not know that further disease and damage therefrom can be, for all practical purposes, entirely prevented in the future. The dentist does not know this either. Therefore he is not prepared to give his patients the advice and information in this regard they have to have in order to maintain the highest degree of dental health.

Unfortunately there are too many people who are complacent or unconcerned about preservation of their teeth. This results largely from lack of information as to the importance of the teeth and the seriousness of the diseases from which they suffer and are ultimately lost. There are many others who *are* concerned about the welfare of their teeth and would adopt and follow the necessary method of personal oral hygiene to preserve them if, indeed, they could know what that is. Their information in this regard must come, either directly or indirectly from the dental profession upon which they depend for treatment, restorations and advice.

Dentists can pass on to their patients only such advice and information as they themselves know. A dentist cannot be expected to successfully teach his patients effective personal oral hygiene, and in-

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fluence them to follow it, if he does not know it and follow it himself. He can be expected to bring to his patients practical application of only such facts relative to the cause and prevention of dental disease as he learned in the dental school.

The exact method of personal oral hygiene which is absolutely necessary for the highest degree of oral cleanliness and dental health is not taught, as must be done sooner or later, in the dental schools of the country. This means that those who graduate now, and those who graduated previously, are not prepared to successfully instruct their patients how to prevent the diseases of their teeth or to prevent further advancement of existing disease. The purpose of this paper is to call attention to this serious deficiency in dental education; also to urge responsible leaders in this important field of human health-welfare to investigate this matter and get the facts in this regard for such use of the information as they wish to make of it in the future.

Microscopic Study Necessary

Both caries and periodontoclasia are caused by microscopic organisms. The lesions at first are microscopic in extent, they advance microscopically, the tissues involved are composed of microscopic elements and the destructive processes, are microchemical. Under these circumstances the dental student can learn, and know of his own knowledge, the etiological and pathological conditions at the locations where the lesions originate and advance, only through proper study and observation of suitable material under the microscope.

The binocular dissecting microscope is essential, as is also the compound microscope. Each student must have adequate access to, and make much use of, these instruments; of course, under competent instructor guidance. Without full use of these specific facilities the students' information as to the etiological conditions which must be prevented to prevent or control these diseases, will be secondhand

at best, often confused and too often incorrect.

Study of large numbers of extracted tooth specimens is absolutely necessary. These are available from extraction clinics. Formalin preserved specimens are suitable for almost all purposes. Quite simple technical procedures are adequate, and in fact preferable, for most purposes.

Study of Caries

Early stage caries lesions (chalky enamel) must be prevented and further advancement of such as have already occurred must be controlled, if damage from the more advanced stages of the disease (cavities) is to be prevented. The nature and the prevalence of early stage caries lesions can be learned and appreciated by the student by studying many, and a great variety of such specimens with the aid of the dissecting microscope, but not without this procedure.

A good way is to dip the specimen in hydrochloric acid solution (5 to 10 per cent by volume) for half a minute (or longer) to set free the enamel cuticle. Dip gently in water and then in a weak solution of acid fuchsin (or other stain). Examining such a tooth preparation under the dissecting microscope one can tease off or float off the loosened enamel cuticle and make preparations of pieces of it for other microscopic study. He will no longer be in doubt or confused, as is usually the case, as to the presence of enamel cuticle.

Chalky enamel can be seen and worked with under the dissecting microscope much more satisfactorily after the cuticle (with its adhering bacterial film) has been removed. In studying large numbers of specimens (as everyone should do) it is convenient to prepare them by first dipping the tooth in acid and stain as above, and then brush it off with a toothbrush to remove the cuticle. By working with such preparations one learns the very much greater incidence of such lesions and their relation to more advanced lesions better than he could possibly know otherwise. Sections cut through chalky

enamel lesions, examined under the dissecting microscope, enable the student to see for himself the way in which this condition (caries) extends and advances into the tooth.

Measures to prevent early stage caries must be designed to prevent or minimize accumulation and retention of bacterial film (plaque) at the particular location. The student must learn the nature of this material. With the aid of the dissecting microscope small particles may be picked with a suitable teasing needle from any location of interest and prepared for further examination under the high power microscope. In this way the student learns, and knows of his own knowledge, the nature and characteristics of the bacterial film pad, without which caries does not develop and against which effective personal oral hygiene methods must be applied.

Study of Periodontoclasia

Periodontoclasia is a universal disease of man,⁴ originating in childhood and never ending as long as the individual has any teeth left. The cause is foreign material—bacterial film and usually calculus—attached to the surface of the tooth at the entrance to, and within, the gingival crevice. As the chronic inflammatory process continues the periodontal tissues are slowly destroyed and the gingival crevice (now a pyorrhoea picket) advances apexward.⁵

The only way the student can learn, and know of his own knowledge, how this disease advances is by studying, by appropriate technic, large numbers of extracted tooth specimens under the dissecting microscope. There is a demonstrable line⁶—the zone of disintegrating epithelial attachment cuticle (zdeac)—to be found extending part way or entirely around the tooth. This line is located at the very bottom of the gingival crevice (periodontoclasia lesion) when the tooth was in the mouth and serves as an accurate landmark indicating the exact location to which the lesion had advanced. It indicates the exact location of the outer bor-

der of the receding epithelial attachment and of the inner (apexward) border of the subgingival bacterial film on the tooth before it was extracted.

First, one should thoroughly familiarize himself with this line. The best procedure is to stain the specimen in crystal violet (0.5 per cent aqueous solution) for one-half minute (or longer). Then brush it off gently with a soft toothbrush with round or smooth ended bristles. This removes most of the bacterial film and other loosely attached material. It does not remove the zdeac, which may now be studied under the dissecting microscope. One should observe this line (now stained) on many different tooth specimens and learn to recognize and identify it satisfactorily on such preparations.

The brushing does not remove the calculus on the tooth. Examining such stained and brushed off specimens under the dissecting microscope enables one to learn the close relation of the calculus⁷ to the very bottom of the lesion. This is of great importance. Successful treatment, control and prevention of further advancement of the existing lesions of this disease requires that this subgingival calculus, especially the deeper part of it, be thoroughly removed by proper scaling.

After one is familiar with this landmark on stained and brushed off specimens, he can usually locate it on specimens stained but not brushed off. From such specimens under the dissecting microscope, he can pick particles of the soft bacterial film material attached to the tooth at any location desired with relation to the zdeac.⁸ Examining such material under high magnification and from many different tooth specimens one learns, and then knows of his own knowledge, the nature and abundance of this bacterial foreign material on the surface of the tooth within the gingival crevice.

An effective method of personal oral hygiene must provide for removal or minimizing of this etiological material sufficiently frequently (at least once a day) to prevent reaccumulation of harmful quantities in the future. The only way

this could possibly be done is by proper application of the bristles of the right kind of toothbrush and the filaments of the right kind of dental floss to the areas to be cleaned. This is absolutely necessary for prevention and control of this disease.

Comment

Conclusions drawn from clinical trials of measures, remedies and procedures for the prevention and control of the principal diseases of the teeth are of limited use and often confusing and misleading. Clinical diagnosis and observations are concerned with the advanced (diagnosable) stages of the respective diseases and do not take into account the earlier stages. Measures for prevention must be based upon facts (and not guesswork) as to the microscopic etiological conditions at the locations where the lesions originate and advance.

The method of personal oral hygiene referred to above is necessary to prevent or minimize the local etiological conditions. Anyone knowing of his own knowledge, through microscopic study, and understanding these conditions would also know that approximately this exact method would not only be necessary but that it would be effective. He would not have to depend upon clinical trials.

Summary

Attention has been called to a serious deficiency in dental education at the present time.

Those who hold responsible positions in the field are urged to make the necessary investigation and get the facts in this regard.

Brief mention has been made of some of the necessary steps to correct the situation.

References

1. Bass, C. C.: The necessary personal oral hygiene for prevention of caries and periodontoclasia. *New Orleans M. & S. J.* 101:52, 1948.
2. Bass, C. C.: An effective method of personal oral hygiene. *J. Louisiana State M. Soc.* 106:57, 106:100, 1954.
3. Bass, C. C.: Some important developments presently influencing dental health. *J. Louisiana State M. Soc.* 109:201, 1957.
4. Bass, C. C.: Prevalence of periodontoclasia. Published independently. Reprints available from the author.
5. Bass, C. C. and Fullmer, H. M.: The location of the zone of disintegrating epithelial attachment cuticle in relation to the cemento-enamel junction and the outer border of the periodontal fibers on some tooth specimens. *J. D. Res.* 27:623, 1948.
6. Bass, C. C.: A demonstrable line on extracted teeth indicating the location of the outer border of the epithelial attachment. *J. D. Res.* 25:401, 1946.
7. Bass, C. C.: The relation of the inner border of sub-gingival calculus to the zone of disintegrating epithelial attachment cuticle. *O. Surg., O. Med., O. Path.* 3:1125, 1950.
8. Bass, C. C.: The relation of the inner border of bacterial film on the tooth within the gingival crevice to the zone of disintegrating epithelial attachment cuticle. *O. Surg., O. Med., O. Path.* 2:1580, 1949.



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