SOME GATEWAYS OF CRYPTOGENIC INFECTION. THE AVEOLAR PROCESSES.*

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The great importance of the tonsils and adenoids as a source of sepsis has been recognized by all, but there are many other conditions to be found in the mouth that may have an important influence upon far distant points of the body. In 1908, the writer reported a few cases of such oral diseases that are very common, hoping to emphasize the importance of early recognition of these conditions. In looking over the Transactions of the Triological Society of the past fifteen years it appears that no paper on this subject has ever been read before that society on this subject, although such men as Osler, J. B. Murphy, Hunter, Knopf, Rhein, Collins, Ebersole and many others have written about the dangers of oral sepsis and many of the foremost dentists are sending out valuable articles which have been most instructive to the writer.

It is safe to say that the x-ray has done more to demonstrate pathological conditions in the jaws than any other measure, and no professional man should fail to make use of the radiograph picture in order to detect pus cavities, caries, alveolar atrophies, improper fillings in root canals,—and even the ordinary fillings themselves,—pulp-stones, odontomas, unerupted teeth, roots remaining after extraction, bone cysts, and many other obscure conditions. As a matter of fact, there is no excuse for the existence of septic and often suppurating conditions in the mouth, which serve to contaminate all food and drink and from toxins which enter the system directly. The old theory that all bacteria are killed by the acid of the gastric secretion becomes clearly absurd when we realize that this acid is only found during the active period of digestion of solid foods. It requires some time for the stomach to provide enough of this free acid to have any effect on the bacteria which have in the meantime escaped into the smaller intestine with its alkaline secretions. Every mouthful of fluid, even the saliva, is contaminated, and these bacteria are not even subjected to any possible effect of the acid, as its secretion is not stimulated except by solid food.

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Unfortunately, owing to the absence of pain and the fact that the septic secretions are poured into a cavity that is already moist, the majority of patients do not recognize their condition and are greatly surprised when it is explained to them. Statistics show that over 98 per cent of all school-children have caries of the teeth—which means that they cannot masticate properly, and in consequence there is a lack of proper development of the jaws and a constant absorption of almost every known form of bacteria. Many have fistulous tracts in the alveolar processes with glandular swellings in the neck due to direct absorption. On the other hand, the premature extraction of decayed teeth is bound to affect the normal development of the jaws and the face.

Figure 1 shows destruction of alveolus over second bicuspid and second molar probably caused by apical abscesses.

A great deal is being done by the dentists and by all those interested in the prevention of disease, to stir up the entire population to an intelligent understanding of the necessity of caring for the teeth, and in some communities the results have already been more than gratifying. Immense sums of money are wasted in our school-systems because of the class of so-called "repeaters," or children who fail to progress, and it has been proved beyond doubt that many of these children are not actually stupid but are suffering from malnutrition and septic absorption resulting from diseased teeth and gums, and that when these conditions have been relieved the children progress as rapidly as others. Germany has thoroughly recognized this fact and has made great strides in the hygienic care and instruction of her children, realizing the immense monetary value resulting from their improved health and development.

In January, 1911, Dr. Wm. Hunter, of London, published an article in the *Lancet*, which aroused the dental profession, and it is

well worth careful reading by our own profession. He shows that these septic oral conditions play an important part in the etiology of a great number of diseases. Besides the glandular swellings of the neck, and gastric and intestinal disturbances, he claims to have found many systemic septic cases, such as ulcerative endocarditis, pleurisies, osteomyelitis, rheumatic joints, nephritis, pyemias, anemias, skin diseases, and even mental diseases. Osler says: "There is not one single thing more important to the public in the whole range of hygiene than the hygiene of the mouth." Dr. Knopf has written extensively on the influence of diseased teeth upon tuber-

Figure 2 shows typical destruction of bone in apical abscess. Apex of root projecting into cavity.

culosis, and shows the possibility of its being one of the chief causes of infection. He also says that it is almost impossible to cure tuberculosis patients who have no teeth or have bad ones. He says: "To put it briefly, I would say that bad teeth, or the loss of teeth during childhood, its concomitant discomfort, depression of spirit and lack of appetite, produce that physiological poverty which renders the delicate system of the child not only more prone to tuberculosis and to the invasion of the germs of serious acute contagious diseases, etc., but also more susceptible to nervous affections, such as melancholia, hysteria, chorea, and St. Vitus' dance." Rosenow

has proved that gastric ulcer is caused by streptococcic infection, and that the bacteria are frequently derived from blind alveolar abscesses. He has also proved the same source of infection to have caused endocarditis and other diseases.

With this brief review of some of the many diseases which are at least partly caused by oral sepsis, let us consider the most frequent sources of these infections. They are four in number, and are all readily recognized, if sought for, so there should be no excuse for neglecting them: (1) Dental caries; (2) alveolar caries; (3)

Figure 3: (a) Dark area over second bicuspid shows chronic apical abscess. Note incompleteness of root filling. Also note irregular curves of roots of second molar. (b) Acute apical abscess shown by dark area. Fine wire extends through a false opening in root. (c) Shows loss of alveolus around central and lateral incisors and poor root fillings. Advanced pyorrhea of these teeth.

pyorrhea alveolaris; (4) bad crown and bridge work, bad fillings and impactions.

Dental caries is to be found in practically every human mouth, and comes particularly under the care of the dentist. We could do much to lessen this destruction of the teeth if we would impress upon every patient that every cavity is a septic danger-spot which may lead to serious consequences and great suffering. Alveolar caries is almost invariably caused by disease of the tooth pulp, which becomes infected whenever the dental caries extends deep enough to expose the pulp cavity, or it may be caused by trauma-

tism. It is much more common than is generally supposed and should always be looked for in every patient who has given a history of having had a gum boil or an ulcerated tooth. The fistulous tract may have a most minute opening above the apex of a tooth, or it may be found extending up along the root itself, and will only be revealed by the presence of a drop of pus on pressure. A probe introduced through these minute openings often passes into a really extensive cavity in which roughened carious bone can be felt. Another very suspicious sign is a peculiar bluish color of the al-

Figure 4 shows carious disintegration of whole alveolar process resulting from pyorrhea.

veolar process over any of the teeth, such as is so often found over old carious bone-tracts in other parts of the body. The dental profession has at last been awakened to the ravages of this often painless, insidious disease because of the evidence which can always be obtained by the radiograph, and many patients are being saved much actual suffering and long periods of septic absorption because of the positive diagnosis which can now be made in many doubtful cases. Some claim that blind abscesses often exist with no opening and that these are the most dangerous. It is our duty to have radiographs taken whenever our patients' dentists have failed to

do so, and we should be able to interpret the picture thus obtained. The chief cause of long-continued alveolar abscess lies in the failure to completely fill the emptied root canal, and, as a rule, this latter condition can be easily recognized in an x-ray picture by any one familiar with the tooth structure. It is almost certain that all good dentists will resort to this means of diagnosis whenever they are in doubt, but there are still many who do not, and when one examines the radiographs carefully it becomes plainly evident why they do not wish to know too much.

Pyorrhea alveolaris—i. e., Rigg's disease—is a suppurative pericementitis and an interstitial alveolitis. As a matter of fact, the bone of the alveolar process is very poorly nourished and readily

Figure 5 shows wire passing through a perforation of the hard palate caused by an apical abscess. Also shows advanced pyorrhea, the lingual root of the second molar being entirely free from the alveolus.

breaks down as the result of infection, it being only a temporary structure placed on the maxillary bones to hold the teeth. It is not present in the new-born child, and it disappears entirely after extraction of all the teeth. Pyorrhea is always the result of failure to clean the teeth properly. Mucous plaques deposit around the necks of the teeth, and the calcium salts deposit in these plaques, forming tartar. These deposits gradually set up a gingivitis which slowly advances up the roots of the teeth, separating the pericementum or dental ligament from the tooth and allowing the tartar deposits to extend even to the apices. As the disease progresses, the bone of the alveolar process is destroyed (see Figure 4), the gums recede from the necks of the teeth (see Figures 5-9) and they be-

come loose and eventually fall out. There is a constant flow of septic pus from each diseased socket. The breath is generally very foul but, strange to say, this is not often appreciated by the patient. There is little, if any, pain, but the gums become very tender and swollen, and as they bleed very easily the cleansing which is so urgently needed is more and more neglected. Although it is both an offensive and a dangerous disease, because of its tendency to produce other infections, it is nevertheless found in countless numbers—the rich as well as the poor. It does not matter whether we

Figure 6 shows carious pocket around roots of molars and also left lateral. Also shows shrinkage of alveolar margin from the teeth and calcareous deposits on the roots of the second molar.

say that is caused by systemic disturbances, improper food, defective mastication, bacteria, by misplaced teeth, or by purely local conditions. Undoubtedly, each plays a part in causing the disease, but it is enough for us to know that the disease can be arrested and all suppuration be stopped, if taken in time.

Vaccine treatment has been advocated by many, and all kinds of diet have had their advocates, but it is well to realize that no case of pyorrhea has ever been actually cured until each and every infected tooth has been scaled and polished, and then kept so. Unfortunately, even in these times and in spite of the brilliant work

Figure 7. Note destruction of both upper and lower alveoli and the calcareous deposits on the exposed teeth roots.

Figure 8: Moderately advanced pyorrhea.

Figure 9: Advanced pyorrhea: Each socket continually discharges pus and countless bacteria.

which is being accomplished by many eminent dentists, there are thousands of dentists who absolutely neglect this dangerous disease, and even tell their patients that it is incurable—either because of ignorance or because of laziness. When diagnosed early it is very easy to control, and intelligent co-operation on the part of the patient as to diet, exercise, and proper cleansing of the teeth should prevent loss of teeth, and also many ill-effects which are bound to follow both the sepsis and the defective mastication resulting from

Figure 10 (a) shows impaction of canine. Note the open root canals of two bicuspids which have not completely developed. (b) shows appliance which has opened space between lateral incisor and bicuspid and allowed canine to descend rapidly.

the diseased alveolar processes and the loss of teeth. It is now well known that many obscure diseases have been cured by the removal of diseased tonsils after other measures had failed. The same cures result in thousands of cases after the teeth and jaws have been put in a healthy condition, and the medical profession should recognize this fact and be the first to diagnose such conditions.

The slides presented show the actual destruction which takes place in the alveolus as a result of apical processes or gum boils,

and also the shrinkage or atrophy which results from pyorrhea.

It is not the purpose of this paper to go into detail as to causes, effects, or methods of treatment, but the writer earnestly hopes that the importance of these conditions be recognized by the medical men, for by doing our share we can materially help in the great work which is being done by the dental profession and by all those who are working along the lines of preventive medicine.

The grave dangers which arise from bad and unscientific crown and bridge-work are many, and should receive more attention. With much of this work it is absolutely impossible for the patient to cleanse his mouth, and food is bound to accumulate and decompose in the interstices and under the edges of the improperly fitted crowns. Every dentist of repute would be thankful to have the members of our profession join with them in their efforts to stop

Figure 11. (a) Note very bad fillings. (b) Note badly fitted crown on bleusplé and pyorrhea involving canine.

such work, realizing that it is bound to injure the best interests of their profession, and also because it leads to so much suffering and disease from the septic absorption. We all know the discomforts of food impacted between the teeth but do not stop to think that if the teeth were in proper contact this would not take place; nor do many realize the damage that is done by the presence of this impacted food and its decomposition.

If old cases are examined carefully the gums will be found badly receded, and the x-ray will show that bone-absorption of the alveolus actually takes place, much the same as occurs in pyorrhea. Impacted teeth that were never suspected, are being recognized very frequently now, and many very distressing nervous diseases are being relieved by remedying these impactions, either by operation or by orthodontic measures. The writer desires to extend thanks to Dr. U. F. Spies, for several of the illustrations which have been copyrighted.

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