TREATMENT OF CHRONIC SUPPURATIVE PERICEMENTITIS.

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THE term chronic suppurative pericementitis is applied to that disease of the investing tissues of the teeth in which a pus pocket is formed along the side of the root. The pathological changes presented in the paper by Dr. F. B. Noyes are of two distinct conditions; the one caused by deposits of salivary calculus, in which the infection is described as traveling along those lymphatics which are attached to the vessels of the gum tissue, *on the outer side of the bone of the alveolar process*; the other resulting from an initial gingivitis (caused in the main by injury, or deposits of serusal calculus) which travels along the lymphatics attached to the vessels that course thru the peridental membrane, *on the inner side of the alveolar process*. Clinical observation supports these laboratory studies, and both lead to the conclusion that deposits of salivary calculus are not to be considered a cause of the formation of pus pockets.

Before taking up the treatment of pus pockets, one or two additional statements regarding the pathological changes should be made. In the summer of 1912, I suggested to my father, who was then preparing the manuscript for his book on Special Dental Pathology, that we should examine microscopically the tissues overlying the teeth, to see what changes had taken place as a result of the infection and pocket formation. Soon afterwards, I began cutting away sections of tissue for this purpose, occasionally removing parts of the alveolar

process, peridental membrane and overlying gum tissue with teeth which were condemned for extraction. We soon accumulated many specimens which showed the changes which Dr. Noyes has described in detail. One specimen in particular, Figure I, shows practically all the changes except the actual formation of the pocket. The fringe of short ends of fibres attached to the cementum is very clearly shown.

After there is an actual break in the tissue, which apparently occurs about midway between the surface of the root and the bone, the tissue attached to the cementum is exposed to the fluids of the mouth, and it soon dies, leaving the cementum denuded. At the same time, the vitality of the cementum is lost as a result of the destruction of the cementoblasts, which lie upon its surface. It is comparable to a piece of necrosed bone which can not be exfoliated, and remains as a constant irritant to the adjacent soft tissue. Upon these pathological changes, the treatment which I will present, is based. It should be recognized that practically all hope of reconstruction of the peridental tissues to normal, or of reattachment to the cementum is gone forever.

The pathological picture of these overlying tissues is one of recurrent infection, which agrees with clinical observation of cases in practice. A pocket once formed is therefore a menace to health in that it offers opportunity for the accumulation of organisms in contact with a connective tissue thru which

Figure I.

Section thru root and labial alveolar process of an upper central incisor, showing about one-fourth of the root close to the apex. Patient forty years of age. The periodontal membrane on the lingual side of this tooth was detached almost to the apex and the pocket extended around on both the mesial and distal sides of the root, but was not so deep on either the mesial or distal, as on the lingual. One band of good periodontal membrane fibers is shown near the bottom of the illustration; higher up (towards the gingiva) much degeneration of the periodontal membrane has taken place, altho many bundles of short fibers remain attached to the cementum. The general trend of the blood vessels is apparent. This illustrates the destructive changes which occur within the periodontal membrane in advance of the actual break or formation of a pocket.

there is easy access to the circulation. To treat these pockets in what seems to be the most rational way today requires

Figure II.

Normal periodontal membrane. Section showing fibers attached to the cementum from the gingival line almost to the apex of the root. The section is not quite parallel with the long axis of the tooth and is a little to one side of the apex of the root. The fibers which pass upward into the gingiva, those which pass to the crest of the alveolar process, and those which pass directly from the cementum to the bone are clearly shown as a practically solid mass from the gingival line to the end of the root. A blood vessel is shown arching over the crest of the alveolar process, others may be seen within the periodontal membrane, their course being parallel to the long axis of the root.

that one recognize clearly the meaning of the pathological changes which have been presented. If this is done, then we will give up the idea so long held that our effort in treatment is to bring about a reattachment of the overlying tissue to the root. Having done this, three principal methods of operative procedure may be recommended.

First, the extraction of those teeth about which we may not hope to prevent reinfection by other methods of treatment. The deeper the pocket, the greater the indication for extraction. The position of the pocket must be taken into consideration; for example, a proximal surface pocket of a given depth will indicate extraction, when a pocket of the same depth on a labial or buccal surface might be treated satisfactorily by other means. Much looseness of the tooth, during a period when there is little or no inflammation, would suggest the advisability of removal. Failure to prevent reinfection by other methods of treatment calls for extraction. After a thorough examination, those teeth which are marked for extraction, should be removed at the earliest opportunity.

Second, for those teeth which have pockets, but which are not to be extracted, our problem is that of preventing reinfection. The first procedure is to eliminate irritation, both by the removal of deposits and also by the correction of fillings, crowns, etc., which directly as by bad margins, or indirectly as by bad contacts, cause inflammation. When all sources of irritation are removed, the soft tissue will usually rid itself of infection if the pocket is thoroughly cleansed by irrigation with a mild antiseptic, or with physiological salt solution. Then the problem arises of preventing reinfection of the pocket. To do this, cleanliness of the pocket must be maintained. In the majority of cases this can not be accomplished by the dentist alone, unless the patient is required to return at very frequent intervals, and even then there is

an occasional reinfection in most cases with gradual progress of the pocket in depth.

It is strongly urged that in all these cases the patient be taught to use a rub-

Figure III.

Sketch of the lower front teeth, labial view. There are interproximal pockets between the incisors, also between the left lateral incisor and cuspid. A line indicates the position of the crest of the gingiva. The broken line indicates the crest of the bone. The depth to which the interproximal bone has been destroyed also is shown.

Figure IV.

Sketch of one of the lower incisors shown in Figure III, proximal view. The interproximal pocket, with the destruction of the central portion of the bone, is shown, with the labial and lingual portions of the process about normal height. To eliminate such a pocket it is clearly necessary to cut away the gum tissue and bone on the labial and lingual at least to the level of the interproximal bone.

ber bulb syringe with a large nozzle, and instructed to wash the pockets out with warm salt water twice daily, as a part of the routine technic in mouth

hygiene. In cases in which this cooperation by the patient is secured, reinfection of pockets is effectively prevented and they may go indefinitely without further progress or systemic danger.

Third. In many cases in which there are pockets, by far the simplest and most effective method of treatment is to cut away the overlying tissue and thus eliminate the pocket. When this can be done, no further treatment is required by the dentist and no special care is necessary on the part of the patient. To carry out this procedure, a rather definite technic is necessary, based upon the

Figure V.

First incision in operation to eliminate pockets. This is a curved line from cuspid to cuspid, the intention being to remove all of the soft tissue and bone to the incisal of this incision. Novocain is injected and the incision made with a small straight knife on the labial side. A similar incision is made on the lingual side with a knife having a blade set at an angle of about forty-five degrees to the handle.

conditions presenting. We may divide cases into three groups: those in which there are pockets on labial or buccal sides of the roots, those in which there are proximal pockets, and those in which there are pockets which encircle teeth.

The operation is performed under novocain anesthesia. The effort is made in each case to remove all overlying tissue, thus laying the root bare to the depth of the pocket. To do this, it is usually necessary to trim off a little of the crest of the process because the detachment of the periodontal membrane from the cementum is in advance of the

destruction of the bone. This can be observed in radiographs as well as in the microscopical specimens. It is also important that the bone be cut to a slightly deeper level than the gum, in order that the cut edge of the gum may slightly overlap the edge of the process; this promotes rapid healing and prevents necrosis of the margin of the bone.

In cases in which there are pockets on labial or buccal surfaces, an incision is first made thru the gum on a line about even with the edge of the bone; that is, the line to which the bone has

the tooth brush may be used. Occasionally, if much of the cementum is thus exposed, the teeth will be slightly sensitive to thermal changes for a week or two. We have had but one case in which the sensitiveness required attention; it was relieved at once by the application of silver nitrate crystals.

In operating on cases of this group, it is desirable that the line of the incision be a gradual curve; there should be no sharp angles. If there is a single deep pocket, as on the labial surface of one lower incisor, it will be of little bene-

Figure VI.

Proximal view, showing position of labial and lingual incisions in relation to depth of interproximal pockets.

Figure VII.

Proximal view showing large chisel (20-9-6 Black's formula) with cutting edge placed in previously-made incision. Chisel is forced thru bone to root; this is repeated several times for each tooth until all of the bone is cut thru. Then with a scraping motion in the incisal direction, the bone and soft tissue are removed. This is repeated for each tooth. Sometimes the same chisel may be used on the lingual, or an instrument having a greater angle of blade may be more convenient.

been destroyed, removing all soft tissue crownwise of this line. No interproximal tissue is removed if there are no proximal pockets. Next the edge of the process is trimmed off with an excavating chisel or a fissure bur the end blades of which have been ground off so that the end may be held against the root, while the side blades cut the process. By either plan the gum tissue is pressed aside and immediately afterwards will overlap the cut edge of the bone. The area is thoroly irrigated with hot saline solution until the hemorrhage has ceased, when the patient is dismissed with instructions to rinse the mouth thoroly with warm salt water after each meal until the gum has healed so that

fit to cut off only the detached tissue, because on account of the narrowness of the notch, the tissue from the sides would grow across, reproducing the pocket. It is sometimes necessary to cut away a little tissue from a neighboring tooth in order to give a more even curve to the gum margin after healing.

The elimination of labial pockets is often contraindicated because of the unsightliness of the denuded roots, particularly in the upper incisor region. Similar pockets on lingual surfaces of the

lower teeth may be treated in the same way. Pockets on the lingual of the upper teeth are less often benefited by this operation because of the thickness of the bone as it curves away to form the palate, which leaves a broad shelf next to the tooth after healing.

In cases in which there are proximal pockets, the operation is more difficult, as it is necessary to cut away the buccal and lingual bone and gum opposite the interproximal space, even with or a little farther apically than the depth of the interproximal pocket. This must be

care for their teeth by proper brushing or by sufficiently frequent visits to the dentist for examination and prophylactic treatment. There is likely to be a more or less complete ring of deposit of serual calculus encircling each tooth, beneath the gum margin. This has resulted in the infection of all of the gingiva, and eventually in the formation of pockets of about equal depth encircling all of the teeth.

If the investing tissues about all of the teeth are involved, I have usually divided the operation, cutting away the

Figure VIII.

A chisel of suitable size is carried thru each interproximal space to remove any unhealthy granulation tissue which may remain in the central portion. Usually a little of the crest of the bone is cut away.

done in order to eliminate the pocket, so that, after healing, the patient may take a mouthful of water and by forcing it back and forth between the teeth, wash the interproximal regions thoroly. Most such cases are due to lack of contact or improper contact of the teeth, and it is of course important that a proper contact be restored.

In cases in which the pockets encircle the teeth, the operation is very simple, consisting of the removal of the unattached soft tissue and a little of the edge of the alveolar process. This condition most often presents in the mouths of persons who have been immune to decay, and have therefore neglected to

Figure IX.

This illustrates two methods of trimming the crest of the bone on the labial and lingual sides of the teeth. This bone should be cut a little shorter than the proximal bone; it should be trimmed sufficiently to permit the cut edge of gum tissue to overlap a little. This facilitates the building of new epithelium over the bone. A fissure bur, used as indicated, should have a non-cutting end. The end blades of an ordinary fissure bur may be ground off.

upper and lower gum on one side at the first operation, and the upper and lower on the other side at a later time. Or sometimes one side of each arch has been operated separately, making four operations in all.

This plan of eliminating the pockets has greatly simplified the management of those cases which were most difficult and unsatisfactory as previously treated. The operation is completed in a very few minutes, and no further treatment is necessary. Many cases have

been kept under observation for several years without requiring further attention. Teeth, which have been very loose, have become much more firm and have remained so. Patients generally express gratification at being free from the intermittent attacks of sore teeth which are

Figure X.

The proximal view about two weeks after the operation, showing growth of soft tissue covering the bone.

Figure XI.

Labial view of case after operation. All pockets have been eliminated. The wide open interproximal spaces may be kept clean by rinsing the mouth thoroly with water after each meal.

symptomatic of recurrent infections. Many teeth which would otherwise be extracted to remove the menace of systemic infection, may be safely retained. We have used this method extensively during the past seven years and our results have generally been satisfactory; it has come to be our routine method of treatment for the majority of cases presenting.

DISCUSSION.

E. H. Hatton, Chicago.

These papers are most important because they deal with fundamental principles of the anatomy and pathology of the teeth and adjacent structures. No system of technical procedure or treatment can endure unless it is based upon these principles. Because of this the demonstration of the presence and distribution of lymph channels in the peridental membrane and pulp is a matter of the highest importance. Infection elsewhere follows lymph channels, and the study of diseased peridental membrane and pulp argues for the same course here. Indeed it has been shown repeatedly that the advance of the infection does parallel the course of the lymphatics as demonstrated by Noyes and Dewey; their preparations are most convincing and a distinct advance beyond any previous work, indeed it is still taught that there are no lymphatics in the pulp.

All of the gum tissue removed by Dr. Black in his clinic has been sectioned, and it is possible to say that the changes seen are uniform and that they are largely perivascular in location. It is possible to show that there is very little unchanged gum tissue in these specimens, and that the operation is conducted so as to conserve as much as possible of the structures. The operation is simple, and yet technically well planned. The results are excellent and lasting beyond reasonable expectation.

In applying these papers to practical affairs there are two statements to be made. First, the dental and medical professions are united in the belief that the teeth and the surrounding structures offer locations for foci of infection, and that everything is being done to protect the rest of the body from the results of such infection by a rather radical revision of both medical and dental practice. Second: The dental

profession must not overlook the conservation of the teeth and mouth structures as far as it is reasonably safe. From a decade of criminal conservation of diseased teeth, the practice has swung to the equally undesirable and serious sacrifice of blameless teeth.

Such papers as the two under discussion furnish a basis for harmonizing and correlating these two matters, and nothing is more important now in the practice of dentistry.

F. W. Merrifield, Chicago.

Mr. President, Members of the Illinois State Dental Society, Ladies and Gentlemen:

In our considerations of this subject we might well divide our attention between some of predisposing causes of periodental infection and destruction, and the different means by which these conditions may be remedied or cured.

Perhaps one of the foremost in the first division is malocclusion:

Broadly, malocclusion may be considered as of two types.

1. That in which the teeth are in abnormal occlusion from infancy and secondly that type which is induced by faulty dental operations.

These latter, in which contacts are not restored—where normal spacing is not obtained and where fillings, etc., are so placed that occlusion, both when the teeth meet their antagonists in direct closing and during masticatory effort—is not properly restored. In both of these types trauma to a greater or lesser degree is present—leading to a weakening of the resistance of the soft tissues and opening avenues for a possible infection.

In the first type, the orthodontist can and is doing much to prevent periodental destruction. In cases of the second type the general practitioner must assume much responsibility.

Teeth are removed with little or no thought for the care of spaces created and the consequent opening of contacts

and the excursion of teeth thru the arches. Fillings are left too high, bridges are made which do not allow of normal mastication and which eventually destroy themselves. Many other factors will be found and while little dental restoration is perfect, there is room for much more care and consideration of these conditions.

Taking predisposing conditions from another angle we find injuries caused by some operative and prosthetic procedures. Fillings placed without regard for the normal space mesio-distally will result in the crowding of gum tissue in the interproximal areas with the consequent irritation, injury, infection, and perhaps destruction.

It will be well to mention factors which originate with the individual patient. The excessive and unwarranted use of toothpicks, the over-zealous use of dental floss and of the tooth brush, may each produce serious results, altho perhaps very much less harm is done with the brush in its over-use than its neglect.

Attention to the foregoing will result in much prevention which means more than cure, but what of the cases we are called upon to cure? A chronic suppurative condition of the periodental membrane, may be considered as one of the three classes:

First, that in which the removal of deposits, polishing these surfaces and the correction of fillings, etc., may effect the cure, almost without exception.

Second, that in which the suppurative process has progressed to the point where a considerable area of the periodental membrane attachment is destroyed with the resulting formation of a pocket, but with a not too great involvement of this structure or the alveolus, and

Third, that in which almost all or the greater part of the attachment is destroyed with the accompanying alveolar absorption. In cases of this type extraction appears to be the logically sanitary treatment.

Cases of the second class are the ones which are claiming the attention of the profession the world over as keenly now as ever. In our treatment of this type of cases, we must approach from several different angles. We must know the tissues involved, their functions, histology and their pathology—we shall then know what we cannot do or expect and then we have a reason upon which to base our hopes of success.

Another angle, and an important one, that of cooperation on the part of the patient. I believe that a great percentage of failures arise from lack of real interest and cooperation given by the patient, either along the line of general care and cleanliness or perhaps in regard to suggestions offered as to diet.

Still another angle—that of expediency. Do patients appreciate long drawn out, extensive scaling, planing and polishing operations and subsequent reporting at frequent intervals over a future indefinite period and then only so that the suppurative process may be controlled and not eliminated? When we realize that a detachment of the periodontal membrane as the result of a suppurative process involves not only the death of the cementum of the root itself but also the destruction of the cementoblasts in the membrane which provide its attachment to the cementum—then only can we appreciate the futility of attempting to cure these conditions by any means which permits the overlying tissue forming the pocket to remain rather than to take the obvious and easy—tho radical method of removing it surgically.

During the last two or three years I have had opportunity to watch the results in cases treated in such a manner, that is, eliminating the pocket formations by cutting entirely away and followed with a good measure of success. Such a method recommends itself for the rapidity with which infection may be eliminated and the condition improved.

While all cases so treated are not uniformly successful, it is more likely to prove successful in restoring health to the tissues involved.

Dr. Collins: I would like to ask Dr. Black whether, when he referred to contact, he meant any space at all existing between the teeth or only where retention of food will apply. We know in many mouths in which there are spaces between the bicusps, the tissue is perfectly healthy. If that is the case, would it not be advisable in some of these patients to grind away and polish some of the proximal surfaces below the contact point, so that food will not stay?

I would also like to ask him, if the pocket is shallow and the deposits are removed, whether the gum at that point does not atrophy, and what about removing the gum tissue over the pocket without cutting it away?

Q. How does this surgical operation that Dr. Black describes affect the teeth? Does it make them extremely sensitive and annoying to the patient, or is there any danger of thermal changes causing death of these pulps?

Q. When the teeth are scaled, are they scaled before operating or at the time of operation?

Dr. Black (closing the discussion): I will confine my remarks to replying to the questions that have been raised. First, in regard to the possibility of gum tissue receding over a shallow pocket, and if there is anything more done than to scale or clean that area. That happens in a good many cases and is a condition in which nature accomplishes just the same thing that I am proposing we should do when nature fails to do it. It does not happen in all cases by any means, because in a great many cases, even with a shallow pocket, we will have a swelling of that tissue and of the gingiva. In these cases I will cut the tissue away, but in the majority of cases where the pockets are quite shallow it is unnecessary to do

this operation. I would not have you think for a minute I would suggest the application of this operation to all cases in which we have pockets, because a great many of them can be better treated as we have been accustomed to treat them.

About the question of contact. We all, I presume, recognize that there are a great many cases where there is a wide open space between the incisor teeth in which no food will collect because the space is so wide, and these tissues remain in a healthy condition. We less often see that between bicuspid and molars where the force used in mastication is heavier. I would not grind off the surfaces of the teeth to make a more open space so that food would not wedge. We do not have the same conditions we have between the incisor teeth where the spaces are wide open. The normal contour of the proximal surfaces directs the food slightly away from the tooth surface where the food comes in contact with the gingiva. If we grind off the convexity, the food strikes on the edge of the gingiva where it meets the tooth and it is more likely to be inflamed. If the teeth are so close that food catches, let us remember that they are usually close enough so that we can build out the contact. I prefer to cut a cavity in a sound tooth and put in a filling to build out the contact rather than grind the surfaces away. There is an occasional case in which I have done what has been suggested; I have cut away and opened the contact wider.

As to the sensitiveness of these teeth, where very much of the cementum is exposed, such as occurs in these operations, where we cut the gums away from five or six teeth, these teeth will be sensitive to the extremes of heat or cold for a week or two. We have had but a single case out of several hundred that have been operated on in my clinic in

which reaction to thermal shock required treatment. We went over the surfaces of the cementum with silver nitrate and the sensitiveness was relieved at once. The teeth were comfortable after that.

In answer to the other question, I would scale these teeth after cutting the tissue away because it is much easier to do. On the other hand, there are a limited number of cases in which the tissues are badly inflamed as the case presents and in which it is desirable to remove the bulk of the deposit about the teeth and wash the pockets out with normal salt solution over periods a few days apart to reduce the inflammation before we cut away the tissue, because we will have so much hemorrhage and may be less successful in obtaining anesthesia with novocain while there is so much inflammation. It is a good principle in surgery to reduce very marked inflammation before you inject and cut away this tissue.

We have a group of cases almost by themselves in which the pockets are about the lingual roots of the upper first molars. If these are very deep and involve the bifurcation, I would, as a rule, prefer to amputate the lingual root of the tooth, because in the majority of cases, particularly in the upper first molars, if you have destruction of bone and changes around the root into the bifurcation, there is no way of securing a reasonable amount of cleanliness. With lower molars it may not be so necessary to amputate the roots. I have seen occasionally a case of a lower first molar in which we have cut away bone and the overlying tissue below the bifurcation and epithelium was built over the cut surface thru the bifurcation, leaving it the same as in the case of an old person in which the bone and the overlying soft tissues have receded half the way down, the roots being exposed at the bifurcation of the teeth, and yet there is no inflammation.