

## ORAL INFECTION AND STERILIZATION.\*

M. L. RHEIN, M.D., D.D.S.

Lecturer on Dental Pathology, University of Pennsylvania.  
NEW YORK CITY.

The lack of requisite training of medical undergraduates in dental principles is well understood by our Section. Appreciating as we do the bar to general efficiency which this defect in primary education causes, it has been for many years one of the important aims of the Section on Stomatology to endeavor to have proper instruction in dental principles made a part of the medical curriculum. To all practitioners laboring under this disqualification, oral infection will always be more or less of a bugaboo. This is due to the fact that in order to be able to comprehend any departure from a normal condition of the tissues in the dental region, it is necessary to be thoroughly familiar with the physiologic appearance of these parts.

The most important thing in oral infection is, naturally, a proper diagnosis. For this purpose it may be best to separate the subject into two subdivisions; first considering it from a standpoint of semeiology, where the local pathogenic condition is merely a symptom of some constitutional disease; and, secondly, from an etiologic standpoint, where the mouth infection may truly be said to be the exciting cause of other functional disturbances.

When we consider the vast network of fine capillaries that freely anastomose through the gum tissue, and the fact that they are the arterial terminations of one of the longest of blood courses, it is not unreasonable to suppose that in all forms of malnutrition the tissues nourished by this ultimate capillary network should be the first to exhibit symptoms due to a lack of normal nourishment. The gums, the pulps of the teeth and the lining membrane of the roots, by means of which they are properly articulated in the alveolar sockets, are the parts nourished by these capillaries.

In all diseases of the vital organs, before any other clinical symptoms are made manifest, these tissues assume a pathologic appearance, varying in character and degree according to the nature and severity of the disease. Atrophic changes are liable to be produced by numerous local causes, and thus easily mislead the student. When, however, the changes in the local appearance of the gums are merely symptomatic of some constitutional disease, the acute local symptoms continue to increase in severity with the progress of the disease, and in consequence, the clinical aspects of the gums in these vital diseases become great aids in prognosis. When the vitality of the local parts is depreciated to a sufficient degree, they become a prey to infection, and the result is seen in the condition commonly known as pyorrhea alveolaris. When the stage has been reached where the discharges emanating from the alveolar sockets cause irritation of the surface of the digestive tract, due to the absorption of the toxins by the swallowing of the same, it becomes an additional menace to the welfare of the patient.

The nature of this discharge varies considerably, due not only to the stage of the disease, but influenced materially by the character of the functional disorder. A common error of dentists in speaking of these discharges is to fail to differentiate between those of a mild, almost bland character, and those of a more irritating form of

sapremia, and from this to a virulent form of purulent effusion.

If we are to consider this matter from a scientific standpoint, it is time to cry a halt on speaking of all discharges of this nature as pus, without any bacteriologic evidences of its existence. In saying this I do not wish in any manner to belittle the baneful results that frequently ensue from the absorption of toxins where the discharge is nothing more than a simple sapremia. Since pyorrhea alveolaris has become a prominent factor, not only in dental but in medical literature, it is not an unusual thing to see erroneous diagnoses of this disease made. Dental practitioners frequently confound it with simple alveolar abscesses. If this happens it is not unnatural that the medical practitioner should often make serious errors of diagnosis in purulent effusions in the oral cavity.

An interesting clinical experience in this respect will better illustrate the point in question:

Miss L., aged about 50, fell down a flight of stairs. She was bruised considerably about the face, but paid very little attention to the matter for twenty-four hours, when, on account of her suffering, she sent for her family physician, who had been attending her for some time for diabetes.

He found the patient showing some temperature, and when, after forty-eight hours, this continued to increase so that it ran up to 102.5, and her mouth filled with purulent matter, he sent for a prominent surgeon.

After a careful examination the surgeon made a diagnosis of pyorrhea alveolaris, and prescribed a camphor mouth wash. The attending physician, accepting the diagnosis made, felt that the patient would receive better attention at the hands of a stomatologist, and I was called in.

Instead of finding the patient suffering from pyorrhea alveolaris, there was a comminuted fracture of the alveolar process, extending from the first upper right molar to the left canine, and between forty and fifty pieces of fractured fragments were removed. This resulted in the loss of all the teeth in this region. On account of the diabetic condition, the delay in proper operative interference left the patient in a very precarious condition. Infiltrative absorption had already produced a condition of osteomyelitis, and only the most strenuous efforts of aseptic surgery sufficed to save the life of the patient.

In reply to the query of a prominent surgeon as to our methods of diagnosis in oral infections, I said that the same rule applied here that would apply to any other part of the body. If there were any possibility of a reasonable doubt, a diagnosis could only be made by exclusion. One of the common errors that is made in reference to this pathogenic condition, is the idea that it is confined to middle aged and elderly people. There is no age in which a patient can be said to be immune from this disease.

## TREATMENT OF PYORRHEA ALVEOLARIS.

Before proceeding to consider the other types of oral infection, a few words as to the treatment of pyorrhea alveolaris may be of value. The original cause of the disorder must be properly diagnosed and brought under proper subjection. Where this is possible the prognosis is always more or less favorable if capable local treatment is enforced. It is, perhaps, unnecessary for me to state that this means the careful removal of every form of concretion and foreign substance from the teeth and roots and careful polishing of every portion of the teeth and exposed portions of the roots. This must be followed up and persisted in at very frequent intervals. The important treatment of this condition, however, is preventive treatment. It has been demonstrated by

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clinical observation that the frequent cleansing and polishing of the teeth surfaces (done in the proper manner) will so enhance the vitality of the dental region that functional disorders fail to produce the serious pathogenic conditions which result in mouths where this prophylactic treatment has not been used.

#### ETIOLOGY OF ORAL INFECTIONS.

We now come to the consideration of oral infections from an etiologic standpoint; that is to say, those cases that primarily arise in the oral cavity and are the original causes of other troubles.

First of all, in this respect it may be wise to say that there are forms of pyorrhea alveolaris due entirely to local causes. These are most commonly caused by neglect in the care of the teeth and the irritation caused by more or less extensive accretions of the calculi. It is also caused by the irritation produced from badly fitted crowns, wedges, injudicious separating of teeth and other causes which too often can be laid directly at the door of the dental attendant. Local treatment is a ready cure for all of these cases.

Perhaps the most common type of oral infection that is found is the simple alveolar abscess. This is caused by the death of the pulp of the tooth which becomes an easy prey to the first migratory bacteria.

#### TREATMENT OF ALVEOLAR ABSCESS.

The cure of these cases in the acute stage is a simple matter, and consists in the aseptic removal of every portion of the contents of the root canals, their thorough sterilization and subsequent hermetical sealing.

Where the disease has run a chronic course, the alveolar process in the neighborhood of the apex of the root and the outer periphery of the end of the root itself becomes necrosed. In such cases it is necessary, in conjunction with the treatment of the root canals, to surgically remove every portion of the necrosed bone and root if a cure is to be effected. Extraction of the tooth in itself will effect a cure, and of course is frequently the most efficacious remedy in infirmity practice.

At a recent meeting of the First District Dental Society in New York City, a prominent surgeon, reading a paper on this subject, made the remarkable statement that in cases of acute alveolar abscess the tooth should never be extracted until all the acute symptoms had subsided, claiming that it was dangerous to extract in this acute condition. He advised the simple lancing of the abscess, allowing the patient to suffer all the effects of purulent absorption, until, as he said, the leucocytes had overcome and defeated the bacteria.

It is unnecessary for me to place the ban of condemnation on any such practice before this Section. I merely cite it as an illustration of the fact that prominent medical men hold such peculiar views.

The main cause for opinions of this kind is due to the fact that physicians are frequently called in to see patients suffering from a more or less severe pyemia, subsequent to the extraction of some tooth. They fail to recognize the fact that the pyemic condition has been caused by lack of proper aseptic care of the wound after extraction of the tooth. In this way improper dental service is the cause of illogical medical inference. Oral infections involving the antrum should receive the same thorough treatment of removal of the focus if a cure is to be effected. When infections are absorbed through some of the many channels in the jaws, as per the inferior dental canal, speedy and radical surgical work is required to effect a cure.

Whatever the condition may be, a careful differential diagnosis must make clear the nature of the malady.

The effect on patients of any of these forms of oral infection is two-fold. In the first place, they suffer from the direct absorption of the toxins from the constant swallowing of the contaminated secretions, which tend not only to irritate the digestive tract, but in turn are absorbed into some particular portion of the tract, and frequently serve to increase or start up a chronic autointoxication of the system. This, in turn, results in the impairment of some of the functional parts of the body, and it is not an uncommon thing to see an etiologic oral infection causing constitutional derangements which are again manifested most markedly in the mouth by producing the well-known symptoms of pyorrhea alveolaris.

#### NEGLECT OF MOUTH INFECTION.

In closing, I wish to call attention to the serious neglect by the general surgeon of the evil effects of mouth infection. As stomatologists we realize how small a percentage of people keep their mouths in an aseptic condition. The modern operating room is replete with every aid and contrivance that can assist in aseptic surgery. Clean aseptic garments are a necessity to every attendant, the mouths of the operator and attendants are covered with sterilized materials; the hands of the operator and assistants are covered with sterilized gloves; the patient is carefully prepared for the operation in every respect, except that of his mouth, which frequently is filled with sapremic, if not with purulent effluvia. I leave it to the logical imagination to picture the result of such conditions, especially in intestinal surgery.

#### DISCUSSION.

DR. E. C. BRIGGS, Boston—I think autointoxication in the alimentary canal plays an important part in the infection of the mouth. It has seemed to me, in my examinations of the saliva and of urine in cases of interstitial gingivitis, that I have found the most important indication for treatment to be the thorough cleansing of the alimentary canal. One patient may show uric acid diathesis and another only poor nutrition, but in most cases there is a failure on the part of the patient in his daily life to have the alimentary canal thoroughly clean, and as a result he becomes autointoxicated. I want to speak of an operation for the correction of prominent sockets of teeth, which I am not aware has been done before. It is for the treatment of cases in which the teeth, if left to themselves, erupt and, extending until they have cleared themselves of the gum, project down very far, overlapping the lower incisors and give the "gummy" smile so disfiguring to the patient. Sometimes the lower lip almost covers the upper teeth and the smile discloses only the gum. Some years ago such a case was brought to me which was very marked. This led me to do a thing which I have done in several cases since, that is, the cutting away of the gum and the alveolar process, when it was necessary, to uncover the crown of the teeth in the position I wished them to stand, that is, before they had come down and projected themselves beyond the normal line of the gum. After the cutting operation I put in a plate, but later on I found that merely enucleating the tooth seemed sufficient to avert a tendency to project downward. I have treated a score of cases in the last six or seven years. It seems to me rather a satisfactory operation and I should like to have someone else try it.

DR. STEWART L. MCCURDY, Pittsburg—Dr. Rhein's important paper is of special value to the oral surgeon whose work is confined to major operative work. Extensive wounds and absorbing surfaces are always present, and one of the most serious complications in operations about the mouth is infection. By observing Dr. Rhein's points, I think we can secure a more

aseptic field and thus guarantee a more prompt repair after operations.

DR. A. W. HARLAN, New York—Dr. Rhein's paper further emphasizes the remarks made by Dr. Latham on the incorrect use of terms. We have had a paper on pathologic irregularities, dealing with suppurations and displacements of the teeth in their sockets. We have had another paper on oral infection which practically deals with the same subject. One gentleman uses the term pyorrhea in one portion of his subject and in another says interstitial gingivitis. To an outsider, knowing nothing about the subject, this would be confusing. Interstitial gingivitis is the term that has been coined by Dr. Talbot to describe the pathologic changes that take place around the roots of teeth. It is an absolutely incorrect term for the reason that many of the lesions of the gums commence, not between the teeth, but on the labial and lingual surfaces of the teeth. It is, therefore, improper to use the term interstitial gingivitis to cover the whole field. The term which is most used describes the effects rather than the cause, and I must protest against the misuse of terms by men like Dr. Talbot, Dr. Rhein and others, because none of the terms convey the intended meaning to a non-professional person.

DR. EUGENE TALBOT, Chicago—I am surprised that such an omniscient man as Dr. Harlan should be ignorant of anything. I never thought of designating inflammation between the roots of teeth as "interstitial gingivitis," nor does the majority of the dental profession understand it so. It shows the greatest ignorance to speak of interstitial gingivitis as an inflammation between the roots of the teeth. Every physician and trained dentist knows that interstitial inflammation means sclerotic inflammation of deep-seated structures such as is found in the kidney, liver and such organs. It never occurred to me when I coined the term that it was absolutely exact; no term can be. It means a deep-seated inflammation in the alveolar process and not between the teeth any more than any other part of the alveolar process. The term is properly understood in this sense by the majority of pathologists. If there is one thing on which physician and dentist alike should be better educated, it is infection from the mouth. It will not be long before more is definitely settled about diseases of the alimentary canal, especially about autointoxication, intestinal fermentation and appendicitis. In some cases I could approximately diagnose appendicitis due to infection from the alveolar process. It is a subject which requires the attention of the medical profession and especially of the dental profession.

DR. ALICE M. STEEVES, Boston—In regard to Dr. Harlan's remarks, diphtheria conveys a definite idea to the laity. There are many infectious acute diseases of the throat that are named diphtheria by professional people, and while it does convey a definite idea to the laity, always conveys a serious idea and is not always justifiable. There are many conditions of the throat, such as follicular tonsillitis, etc., not diphtheria. Also in typhoid fever there are many conditions of the intestinal inflammations that have in the past been covered up for various reasons, perhaps imperfect diagnosis, under the term typhoid fever. As time goes on and these cases are looked into more carefully we know these cases have not all been typhoid fever. I think, therefore, that typhoid fever, diphtheria and various other affections are very likely to be used for a number of conditions without conveying any definite idea to the laity.

DR. GEORGE F. FAMES, Boston—The term interstitial gingivitis has been accepted by many for the want of a better one, but as Dr. Talbot has defined it as a deep-seated inflammation in the alveolar process, it seems to me that neither the term interstitial nor gingivitis applies to the diseases commonly included in the term pyorrhea alveolaris. Undoubtedly numerous diseases of the throat in the past have been classed as diphtheria; at the present time, however, no conscientious physician could make that mistake. The microscope settles it beyond a doubt.

DR. VIDA A. LATHAM, Rogers Park, Chicago—There are no text-books that cover properly the field of oral asepsis. Dr. Hunter's and Dr. Marshall's works are the best. The dentist who meets with all classes of infection of the periodontal tis-

sue—call it pyorrhea alveolaris, if you wish—is at times appalled at the rapid onset and far-reaching results. We see cellulitis with edema of the cheek so severe that we are alarmed. Some people put on cold compresses and advise antiseptics of the mouth, with calomel internally, which is in some cases, perhaps, contraindicated. It seems to me that this is a subject which the profession might take up with a great deal of profit, and also make a better study of the growth bacteriologically, following the lines of Miller, Vincentini and Goadby, who have tried to find some culture media on which they can grow the mouth germs. This Vincent's angina is sometimes confounded with diphtheritic infections and is a source of danger in a dental office. I believe strongly in the fact of auto-intoxication; also that these cases of pyorrhea alveolaris or interstitial gingivitis may be caused in many cases by profound anemia, which we know is often due to autointoxication, and these are the cases where we get a neurasthenic type from some maldevelopment through faulty metabolism.

DR. RHEIN—I had trusted that the purport of this paper would not be misconstrued. It was not my intention to make this a subject practically of dental discussion nor to bring in the mooted subject of nomenclature on this point. It is well understood by all of us how difficult it is to settle that question, so I referred to the condition as pyorrhea alveolaris, because it is the name by which it is most generally known among the medical men, and this paper is intended for the general medical practitioner. Personally, I am ready to adopt the name of interstitial gingivitis instead of pyorrhea alveolaris, if it could be generally adopted. I was much interested in Dr. Briggs' remarks regarding reimplantation, and I believe that in some cases we may get the results he speaks of. I do not believe, however, that we can get better results by reimplantation than with the same amount of surgical efficiency. The objection to implantation remains until it becomes disproved that it is only a temporary operation, unless ankylosis should set in, which is present in only a very few cases. I will take great pleasure in giving Dr. Briggs' method further attention. In regard to sterilization, there is not a general medical practitioner, unless he has been especially trained, who would understand what we mean by "placing the mouth in an aseptic condition." That is one of the things that Dr. Latham brought out. Absolute sterilization of the mouth will always remain an impossibility just as absolute perfection of occlusion will remain an impossibility to the human race. What is construed by the medical profession to be placing the mouth in a sterile condition as possible means, as a rule, to brush the patient's teeth and give him a mouth wash. A patient who is to be placed on the operating table ought to have every particle of foreign matter removed from the teeth. The teeth should be cleansed and polished by a special dental nurse and then the mouth wash properly used will place that mouth in a comparatively sterile condition so far as the mouth bacteria are concerned.

**Occupations for Lepers.**—A Russian physician, H. Koppel of Dorpat, of large experience with lepers, attributes their dread of entering an asylum to the lack of remunerative employment in them. He comments on the rapid course of the disease at home in comparison with the long survival in asylums, and ascribes it to the lack of medical care of the slight injuries to which their anesthetic condition renders them especially liable. At home no attention is paid to these abrasions and they entail long suppuration which undermines the general health. He advocates the introduction of various handicrafts for the lepers, making articles that can be adequately sterilized by boiling before distribution outside or any articles for consumption in the asylums, farming, casting, etc., but all with the proviso that the workers are to be paid for what they accomplish. He has found it advisable sometimes to hire out the men to neighboring farmers. They go directly to the fields and return to the asylum to sleep and eat, and the money they earn is their own. They will not work when there is no money incentive; inaction is depressing and the fear of it keeps them away from the asylums where they belong.