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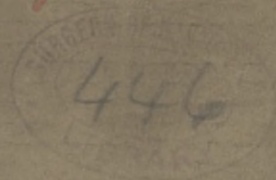
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*presented by the author.*





# DISEASE OF THE ANTRUM DUE TO DENTAL COMPLICATIONS, AND ITS TREATMENT.

BY FRANK ABBOTT, M.D., NEW YORK, N. Y.

MR. PRESIDENT AND GENTLEMEN: Antrum is a name given to certain cavities in bones, the openings into which are smaller than the cavities themselves. The antrum of Highmore was known in Galen's time, but it was not until 1651 that a rational description of it was given by Nathaniel Highmore, of Sherburne, England. It is a deep cavity in the substance of the superior maxillary bone, communicating with the middle meatus of the nose by an opening (in the recent state) about the size of an ordinary knitting-needle, through which the Schneiderian membrane is prolonged to line the cavity. It is called by anatomists an irregular triangular-shaped cavity. Its floor is formed by the alveolar process, and its roof by the floor of the orbit. Any further anatomical description of this cavity, at this time, would be superfluous, except in a few respects, which bear more directly upon the subject before us. The bony covering of the antrum is in several places extremely thin, so much so, that pressure produced upon it by excessive accumulations in the cavity causes it to bulge perceptibly, and unless it is early evacuated, perforation of these thin walls ensues. These localities are—(1) immediately above the canine fossa; (2) upon the buccal wall, above and between the roots of the first and second molars; (3) above and between the palatal roots of these molars; (4) the orbital floor.

A feature of no little interest and importance in studying the antrum, especially pathologically, is the variation in its situation. It has been said that in the examination of one hundred skulls, no two presented this cavity in precisely the same situation. Some are large, some small, some are much higher than others, some well to the front, others set deep back, and in many instances its situation is very different in the same face, one side being very large, prominent, and high, while the other is the reverse.

If the face be short and broad, the indications are that the floor of the antrum is penetrated, or nearly so, by the roots of the first



and second molars, and perhaps by that of the second bicuspid as well. As far as my observation has gone, the first bicuspid and canine seldom if ever penetrate the floor of this cavity with their roots.

*Physiology or Function.*—This, like the frontal sinuses, being connected with and forming a part of the air-passages, is made use of as a reservoir for air, which is kept at the temperature of the body; and in the act of inhalation this warm air becomes mixed with the cold, so that upon its entrance into the lungs it is slightly tempered. Again, as the cavity is lined with Schneiderian membrane, it undoubtedly serves to a limited extent to assist in the delights or otherwise attendant upon the use of the special sense of the nasal organ.

*Diseases.*—It is an undoubted fact that the great majority of the diseases of the antrum are due directly to dental complications. Many other diseases of the antrum, such as the different varieties of tumors and the "troubles common to mucous membrane wherever situated," occur so rarely as compared with that in which the dental organs are especially responsible, that I am disposed to confine myself to the consideration of that alone, in this short paper.

It has been stated that to call this disease abscess of the antrum was a misnomer, from the fact that but for the close proximity of diseased teeth, such a disturbance would probably not have taken place. Recognizing the force of this argument, would it not be well to speak of it as an alveolar abscess, the pus from which finds exit into and through the antrum? By the presence of the pus, however, the entire mucous membrane lining the antral cavity often becomes inflamed and more or less hypertrophied, so that if of long standing a quite general ulceration takes place, and in some rare instances the soft tissue covering the bone in places is altogether destroyed, leaving the bone bare. Thus it becomes a disease of the mucous membrane lining the cavity itself; and for these reasons it has received the name of abscess of the antrum. Abscesses in this cavity are spoken of as arising from mal-positioned teeth. Undoubtedly such might be the case, but it has never been my privilege to see one.

*Diagnosis.*—The means of diagnosing an abscess of the antrum are quite numerous, and generally conclusive. The first symptom of a disturbance which results in such a disease is a slight soreness of a tooth the pulp of which is lifeless; then follows a dull, heavy pain (sometimes sharp and darting up the side of the head) in that side of the face. This moderately increases in severity, for days, weeks, and sometimes for months, before any very especial notice is taken of it by the patient, when attention is directed to it more

particularly by a decidedly heavy feeling and increased pain in the cheek upon bending forward, or in tipping the head from side to side. If the cavity becomes considerably filled with pus before the lining membrane becomes sufficiently inflamed and thickened to have closed the opening into the nose, an excessive discharge will be noticed from that organ upon the affected side. This discovery usually takes the patient to the family physician, who at once pronounces the disease catarrh or ozena, and proceeds in his treatment. This often continues for months, and perhaps for years, before the real disease is ascertained.

Should the lining membrane become inflamed and thickened sufficiently to close the opening into the nose, the cavity then becomes filled with pus, and in consequence of its continued augmentation pressure begins upon the surrounding walls. The inflammation, together with the pressure, causes absorption, or a melting down of the walls progressively until an exit for the pent-up pus is effected, unless professional relief is obtained. While this progressive destruction of the bony wall is going on, a decided bulging of it takes place in the localities above referred to. A prominence is observed by the side of the nose, over the molar teeth, and in the mouth, upon that side, while the orbit is pushed up and out to such an extent that the sight of the affected eye is considerably elevated above that of the other. By pressing with the thumb upon the prominence, by the side of the nose particularly, crepitation may very distinctly be heard. With the above diagnostic signs presenting, it is generally safe to conclude that an abscess in the antrum is the disease in question.

*Differential Diagnosis.*—In order to differentiate between catarrh, or ozena, and antral abscess, it should first be ascertained whether any pulpless teeth are in that side of the upper jaw, and a careful observation should be made as to the relative situation of the antrum. If pulpless teeth are found, and the face is short from the oral cavity to the orbit, the indications are strongly in favor of an abscess in the cavity of the antrum, even should no other especial diagnostic sign be present except the discharge from the nose. On the other hand, should no pulpless teeth be found, or, if present, the face be long between the orbit and oral cavity, indicating that the alveolar process is very thick between the floor of the antrum and the roots of the teeth, it would indicate that no abscess in the antrum existed. The absence of pulpless teeth would make the evidence more conclusive.

*Prognosis.*—The prognosis in the majority of cases is favorable, and with careful treatment they will, within from three weeks to as many months, be entirely cured. There are conditions, however, which militate against a successful termination of the best-directed

efforts. These are, in both sexes, in patients of advanced age, with a generally low physical condition; those of sedentary habits, poor digestion; and those suffering from chronic malarial poison or from some specific disease. In the female the period of cessation of the menses (change of life) is probably the most troublesome to combat the diseases of this cavity. Dr. J. L. Mewborn, of Memphis, Tenn., who has devoted much time to the study of these cases, has arrived at the conclusion that abscess from any cause located in the cavity of the antrum of a female, at or beyond the "climacteric period," is seldom if ever permanently cured. From his report of cases, I do not feel disposed to deny his position. However, the first case I ever treated, in the mouth of a lady, was a patient over fifty years of age. In the course of a month all discharge stopped, and the opening healed. I saw the lady frequently, and for some three years she had no pain or uneasiness to indicate that all was not well in that antrum. Finally, after about three and a half years, an abscess made its appearance again, accompanied with all the pains and generally disagreeable features attending the formation of the original one. When she applied to me I found a second bicuspid, which had been pulpless for many years, to be the exciting cause. This I at once removed, cleansed the antrum, and treated it for a few times, when the lady left the city; and I have never seen her since, now some eight or ten years. She is alive, however, and as far as I know she recovered from her antrum trouble the second time as promptly as she did the first; but, on the other hand, she may never have recovered, and this may be one of the cases which would go to prove Dr. Mewborn's position. In another case, which I saw first in consultation some three years ago, the patient being, I should judge, some forty-eight or fifty years of age, I made a careful examination of the antral cavity, and could find no necrosed bone, nor any condition that would preclude the possibility of a cure within a few weeks, or months at most. I did not see her again until about eight months ago, when she was brought to me by another practitioner. I then made another careful examination of her antrum, and found a territory of denuded bone, as large (as near as I could judge) as a five-cent silver piece, located at the upper posterior wall of the cavity. I advised as to treatment, and the patient went away. I have since, by request, examined this case, and now believe the bone that was bare when I saw her eight months ago has been re-covered with the lining membrane of the cavity. The opening into the antrum from the oral cavity remains about the same; it is extremely small, however. One peculiar feature presented itself in connection with this case, which may be of interest, if not of use, to some one who may hear or read this. The lady complained of intense dart-

ing pains in that side of the face, either in or immediately under the skin. For some time I was unable to account for it, but finally it dawned upon me that probably the denuded and constantly irritated bone in the antrum was in contact with the infra-orbital nerve, or perhaps formed a portion of its immediate covering, so that the trunk of the nerve received the injury, which manifested itself at its terminal fibers upon the face. The treatment was consequently directed to allay the irritation of the trunk of the nerve, which gave relief. This is another case which might be cited to sustain Dr. Mewborn's position, as I believe now, after these years, and a great portion of the time under treatment by different dentists, it is still open. There appears to be no discharge of pus from it, however.

*Treatment.*—The treatment consists in first obtaining a sufficiently large, depending opening into the antrum to admit of its thorough exploration, the ready application of remedies, and its involuntary evacuation of all fluid substances. This is accomplished by, first, the removal of the offending tooth. This I know will be objected to by some, but I consider it, as a rule, by far the safest procedure. If the tooth so removed be the first or second molar, a sharp bur the size it is desired the opening should be placed into the socket of the anterior buccal root, and with an engine driven into the antrum, cutting all intercepting bone as it proceeds; then with lukewarm salt water the cavity is thoroughly washed out, using a spray syringe for the purpose. A most searching exploration of the cavity is now made with a probe, to ascertain whether any necrosis of the bony wall is present. If found, it should be removed. If none is found (as it seldom is), the treatment is proceeded with as follows: Should there be an unpleasant odor arising from it, it can be controlled by the use of a solution of permanganate of potash, two grains to one ounce of water. This is not strong enough to irritate the delicate lining membrane of the antrum, and will very effectually deodorize it. The cavity is then washed out as thoroughly as practicable with a solution of carbolic acid one to sixty-four. This again is not strong enough to irritate the delicate lining membrane of the cavity, but in this strength it is a most effective antiseptic. A solution of equal parts of Listerine and water is often found very efficacious as an antiseptic in the treatment of these cases; a saturated solution of boracic acid in warm water is also found of excellent service. There is no doubt of the efficacy of bichloride of mercury as an antiseptic. I have tried it but once, however, when I used a solution of one to two thousand. This produced so much irritation that I have since confined myself to more mild applications. I have no doubt, however, that a preparation of one to five thousand might be used to good advantage. One feature which especially recom-

mends it for use in the mouth is that it has no disagreeable taste nor smell. After washing the cavity with any one of the above remedies, I apply the same more effectually by means of the spray apparatus. As a stimulant, I use tincture of iodine, one drachm to an ounce of the carbolic solution. Here I wish to remark that my first idea of the use of a spray, as a more perfect means of medicating the antrum, was obtained from Dr. J. L. Mewborn, of Memphis, in 1884. He, however, uses the remedy warm, and applies it by means of a hand atomizer with a single jet. I use compressed air, with a pressure of thirty to forty-five pounds to the square inch, and a multiple spray. The pressure forces the remedy into every irregularity of mucous membrane, and the multiple spray reaches all parts of the cavity. This mode of applying remedies to the cavity of the antrum I consider of incalculable service in the successful treatment of many cases, and I cannot, nor do I think dentists in general can thank Dr. Mewborn enough for this valuable addition to their armamentarium for the treatment of this disease.

After thoroughly medicating as above described, means must be taken to prevent the opening from closing too rapidly. This is done by means of cotton wound upon a roughened bit of wood, or a bit from a whisk broom, as near as can be judged the size of the opening. This is dipped into carbolized oil of sweet almonds, one part of carbolic acid to fifteen of the oil, then placed in position, and tied with a bit of silk to an adjoining tooth. This treatment is followed up every day, and as soon as all signs of pus have disappeared the plug is each day made smaller, until the opening is closed entirely. I never use a drainage-tube. In order to test for the presence of pus, peroxide of hydrogen may sometimes be used to advantage.

In cases where from the history it is evident that a specific poison has to be combated, iodide of potassium is given in five-grain doses three times a day, and each day the dose is increased one grain until the patient becomes perceptibly affected by it, which will be manifested by a decrease, and finally a cessation of the discharge of pus. Many cases yield readily to the effect of sulphide of calcium, given in one-tenth grain doses three times a day.

It is frequently the case that patients are anemic, consequently the disease yields slowly, if at all, to local treatment. In such cases ammonio-citrate of iron, in from five- to ten-grain doses, three times a day, is found of excellent service. Quinine sulphate in two-grain doses, three times a day, is found useful. Persons who take very little out-door exercise, especially if past middle age, should be directed to take such exercise liberally and systematically every day.

It will be observed that I have spoken of but one means of gaining an entrance to the antrum. Other modes are adopted by



some surgeons, some of which I do not approve of. Some three years since, I had the pleasure of listening to the description of an operation for this purpose, and saw the patient upon whom the operation had been performed. It was before this society, at its first meeting, I think, in this room. It consisted in making an incision from the corner of the mouth back past the external antral wall, dissecting the soft tissues from the wall, and making an opening into the antrum over the molar teeth. It was spoken of as a great and very successful operation. This may have been, as far as the cure of the disease was concerned; but it seems to me that the means adopted were altogether too heroic and not at all necessary. Here was, from the history of the case, a simple abscess, from a pulpless tooth, emptying into the antrum, which would have been treated, and probably cured, in a few weeks by a competent dental surgeon, with no surgical work whatever except the removal of the offending tooth and the enlarging of one of the sockets. In my judgment, as dental surgeons we ought to openly discourage, in the strongest manner possible, such uncalled-for surgical work as was shown in this case. Patients suffer quite enough at the hands of us all, when such work is done in the most conservative manner possible.

A most interesting and instructive case came under my observation some three years ago. A gentleman some thirty-five years previously received a scratch on the cheek, by the left side of the nose, which, despite all the efforts of the best-skilled physicians in this country and Europe, would not heal. It was pronounced a rodent ulcer, or flat cancer. It increased in size and annoyance very slowly indeed, so much so that at times it was thought to be more or less under control. Some twenty years before I saw him professionally, he had had the pulp destroyed in the left upper second molar, and the tooth filled in Paris. Some ten years later, his dentist in this city had refilled the cavity in the crown of the tooth, but had done nothing with the roots, they seeming to be filled satisfactorily, no trouble having been experienced from them. Three years ago the past summer the face on that side commenced to swell; the eye became pushed up very considerably, causing severe and constant pain. After his return to the city, I was requested to go and see him. Upon examination, I concluded that the pulpless molar had caused an abscess in the antrum. I was requested by his dentist and attending physician to remove the tooth. This I did, and found my diagnosis correct. Immediately upon its removal quite a discharge of black, fetid matter was observed. This kept up during the following night and a part of the next day. Upon probing the antrum, it was found nearly filled with a mass, which proved to

be cancerous. From this time forward the growth of the cancer was very rapid. In a few months' time I had removed all the teeth in the upper jaw, and several operations had been performed, when large masses of the growth were removed, to prevent suffocation. Death relieved him of his sufferings finally. The lesson to be learned from this case is this: where an incurable disease is present upon the face, great care should be taken that the dental organs are not allowed to become an auxiliary in its progress, thus increasing, to a great extent, the sufferings of the patient, and, in consequence, very considerably shortening his life. In this case the seat of the disease was apparently changed from his face, outside, to the antrum, caused undoubtedly by this pulpless molar. Its more rapid development, and consequent increase of suffering and shortening of his life, was the result.



