metres. Contiguous spaces were sometimes separated from one another only by a thin septum of connective tissue. In some instances a larger space might be seen pushing upward the epithelial layer above it, which was more or less atrophied.

The margins of the spaces were sharply defined, and in some cases presented indications of being lined by thin endothelial cells. In other cases, this endothelial lining could not be made out. At the margin of a very few of the spaces a few flattened multinucleated, atypical cells were observed, which were regarded as of the same character as those seen in Case 1.

No evidence of a bacterial origin for the condition was obtained. As in the first case the spaces seemed to arise from the dilatation of lymph channels.

It will be seen that both cases followed abdominal hysterectomy, and the thought immediately suggests itself, may not this condition in some way be due to a blocking of the lymphatic system as a result of the operation? As to the formation of gas in these dilated lymph vessels, no further explanation can as yet be offered.

EARACHE: CAUSES, TREATMENT, RELATION OF THE EXANTHEMATA THERETO.¹

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WHO of us has not been called, many times it may be, to relieve, for child or adult, that most excruciating pain, an acute earache? Who of us has not felt himself or herself almost helpless in its presence, and wondered what he or she could do to relieve the pain, while the little sufferer moaned and tossed and cried, and seemed not a whit the better for all we were doing? Have we not seen the pain last for hours until finally, when child and attendants were well-nigh exhausted, nature has perforated the drum, the pain has ceased and the child has gone to sleep? Following this we have seen the ear discharge pus for a longer or shorter time, and the pain having ceased, the case has passed from our observation. Such being the facts, and the unsatisfactory nature of the treatment being generally recognized, I offer no apology for bringing to your notice to-night the subject of earache considered broadly as to its causes, and with especial reference to treatment and the relation of the exanthemata thereto. I include under the term earache those acute affections of the external canal, the drum and the tympanic cavity characterized by acute, more or less severe, pain in the ear.

(1) Otitis media externa, including furuncle therewith. This affection is characterized by swelling and pain in the external canal, radiating to and sometimes involving the drum membrane. The pain varies with the severity and extent of the inflammation, but is not as severe as in affections of the deeper parts. In furuncle the mouths of one or more glands become stopped up; there is localized swelling and great discomfort, sometimes great pain, though in the main it is discomfort rather than severe pain. In my experience this is more common among adults than in children. In the more diffuse form there is general swelling, and the whole canal may be closed. I will not consider the etiology but confine myself to the question, Given the condition, what can we do for its relief? If the inflammation has gone on to pus formation, we should incise and liberate the pus, remembering that the

amount of pus is always small, and that relief often comes from the incision even when no pus is present. Before the inflammation has reached the pus stage two methods of treatment are applicable, both of which have been found very useful: gelatin bougies as originally introduced by Gruber, and local applications. A modified formula for the bougies is given farther on. The bougie is inserted into the swollen external canal, and is allowed to dissolve there; and good results follow.

For this affection I am in the habit, however, of using a simpler remedy which has the merit of being always easily obtained and of invariably giving relief, never doing any harm, and of being applicable at any stage of the inflammation. I refer to a five-per-cent. solution of carbolic acid in pure glycerin. The carbolic acid produces anesthesia and eases the pain, while the glycerin, on account of its affinity for water, rapidly removes the serum from the part, and the swelling, heat and tension subside. As the heat and tension are often the things most complained of, the relief afforded is very great. The carbol-glycerin is applied on a small wad of cotton so rolled as to go as deeply into the canal as possible, and changed every two to four hours. Once the patient has been shown how he can do this by the doctor, he will readily make the changes himself.

Suppose this does not wholly relieve, and it becomes necessary to incise the furuncle or any part of the swollen canal? Do not attempt to do it without an anesthetic unless you have a specially tractable patient, or the result will be unsatisfactory to both. The region is so tender that it is practically impossible for any one to hold still. Give a little chloroform or ether to primary anesthesia, and then with a suitable knife make an incision long enough and deep enough to go through all the tissue it is desired to open. The bleeding will doubtless be profuse, but will relieve rather than otherwise. Do not be disappointed if no pus comes; with an opening deep enough, the pus, if there is any in the vicinity, will find its way out. Apply the carbolic-acid-glycerin compound as before, and soon the patient is well.

(2) Earache due to acute trouble in the middle ear from whatever cause. This is most common in children, less so in adults. In the majority of instances it is due to extension of inflammation from the nose and naso-pharynx along the Eustachian tube to the middle ear. Hence the catarrhal troubles of childhood, enlarged tonsils, adenoids and the exanthemata are the most common causes. The intimate relationship between adenoid growths and ear trouble has been often pointed out. Seventy-four per cent. of Meyer's cases of adenoid growth had ear trouble; and it is the experience of every one paying any special attention to the matter that a very large proportion of the cases of running ears have these growths as a cause, or one of the causes. The close anatomical relationship between the adenoid growth and the mouth of the Eustachian tube is sufficient to account for this. Furthermore the adenoid, being a lymphoid structure, is much more swollen and prominent at some times than at others; hence it may complicate the case many times when it is not the prime cause.

As exciting causes, catching cold perhaps comes first and most prominent; then la grippe, measles, scarlet fever, chicken-pox, whooping cough, diphtheria, pneumonia, syphilis, tuberculosis, meningitis and disorders

¹ Read before the New Bedford Medical Society, March 28, 1898.

of the teeth, etc. In connection with all of this latter group of diseases it must not be forgotten that earache is among the possibilities, and may explain some pain not otherwise accounted for. I have recently had a very decided case of earache for which paracentesis was needed, occurring in the case of that ordinarily mild disease, chicken-pox.

The diagnosis is ordinarily easy; and yet I imagine a good many cases of earache in very young children are overlooked at the time, and only thought of when the presence of a running ear calls attention to that as a possible cause of the pain. Many cases of convulsions, extreme fretfulness, inability to sleep, refusal of food, symptoms simulating meningitis, perhaps called that, are nothing more or less than an earache in a child too young to tell where its pain is. Fortunately nature is kind, and in a few days makes an outlet somewhere, usually in the direction of least resistance; but nature, while a good physician, is a poor surgeon, and it is far better to make the diagnosis and pursue the appropriate treatment before perforation has taken place or the pus perchance made its way into the mastoid antrum or through the glenoid fossa. In the young child the diagnosis is often difficult; but the moaning cry of pain, the putting of the hand to the head, more or less fever, refusal of food, wincing when the ear or side of the head is touched, convulsions, perhaps unconsciousness, combined with inspection of the drum membrane will materially aid. In the older child the diagnosis becomes easy; then the child puts the hand to the ear and complains of the pain. I suppose there is no pain more severe than that of an acute earache. I have not yet forgotten the time when as a child I suffered from it for several hours. The agony was intense, and all measures for its relief seemed of no avail.

The minute pathology of the disease I do not now consider; suffice it to say, that there is an acute inflammation in a narrow, bony walled cavity. As the process goes on the lining membrane becomes congested, serous fluid is poured out, the Eustachian tube closes, and except the opening into the antrum there is no place for the products of inflammation to pass out. As a result there is a steadily increasing pressure on the foramen rotundum, foramen ovale and drum membrane; the latter becomes bulged outward, thickened, and it may be separated into its two layers, with fluid between them. If no relief comes, the fluid may later become purulent through the action of bacteria travelling along the Eustachian tube. If not absorbed or not drained through the tube, it forces its way through the distended and weakened drum membrane and discharges through the canal. Failing in this the mastoid may be involved and the more serious brain complications result. In the more acute forms there is no relief until the fluid vents itself; in other cases the continuing pressure seems sometimes to finally blunt the sensibilities of the tympanic nerves, and the pain diminishes before there is discharge or perforation, a sense of fullness with more or less loss of hearing, even to complete loss, being always present. Externally the drum membrane will appear bulged outward in degree dependent upon the stage of inflammation and quantity of fluid present. It may appear reddened and injected or the landmarks completely lost, the drum even presenting a macerated appearance with loose epidermal cells; this latter especially if various applications have been made previous to the inspection.

Here, then, is the clinical picture: inflammation

with fluid formation in a small bony walled cavity, capable of extension to the important structures in the neighborhood, and with the ever-present danger of injury to the hearing, characterized by pain of a severe lancinating character. What is to be done in the way of treatment? How best prevent injury to the drum and delicate structures, and how best preserve the hearing from present and future damage? First, the pain must be relieved. That the efforts of physicians in this direction have not been always crowned with success is proven by the large number of remedies suggested by various authors. Even the distinguished Politzer, in the last edition of his text-book, suggests all of the following as appropriate remedies in acute otitis media (acute earache):

1. Acetate of morphia, 0.2 in olive oil 10, applied as drops to the affected ear.
2. Oil of hyoseyamus, 2½ drachms; aqueous extract opium, 12 grains; as ear drops.
3. Opium salve, externally to mastoid and along canal.
4. Olive oil and chloroform, equal parts as ear drops.
5. Aqueous extract of opium and water, equal parts, put in the ear.
6. 10 per cent. carbolyzed glycerin.
7. 5 per cent. cocain in the nose, so as to reach the Eustachian tube, opening and influencing the ear from this direction.
8. Warm poultices to the whole aural region.
9. Tincture opium and water in varying proportions, in the ear as drops.
10. Cover the whole head with hot, moist cloths.
11. Anodynes internally.
12. Leeches in front and behind the ear.

To these may be added the following taken from other sources:

- Cocaine, 5-10 per cent. solution in the canal.
- Cold about the ear, hot applications in the ear.
- Covering the ear with dry cotton.
- Hot water bottle.

Air douche, with Politzer bag; but this only when acute symptoms have subsided. If well borne it can be used, but if it causes pain it is contraindicated.

Dr. Whitney, of New Bedford, reports very good results from the application directly in the ear of a few drops of the following: olive oil, ten drachms; chloroform, one drachm. This, he says, does not hurt when first put in and quickly relieves. To be repeated as needed. From my own experience I have the following to suggest as having given fairly good results: tincture of opium, or more preferably the fluid extract, one ounce; with atropia, four grains; mix. An equal quantity of this added to an equal quantity of hot water and the external canal filled with this as hot as can be borne; the ear stoppered with a small pledget of cotton and the hot-water bottle applied to the ear.

The ordinary hypodermic tablet (morphia, ¼ of a grain; atropia, 1/16 of a grain) dissolved in some hot water answers the same purpose, and has the advantage of being always at hand. Five-per-cent. carbolyzed glycerin used as for furuncle is often very efficacious, and has served me well, being continued after perforation has taken place or paracentesis has been done.

Of late I have been using some aural bougies, samples of which I show you. They are the aural bougies of Gruber modified by Wood, of Dublin, to which I have added from three to five per cent. of carbolic acid. They each contain three-sevenths of a grain of liquid extract of opium, one-fourteenth of a grain of cocaine and one-fourteenth of a grain of atropia in gelato-

glycerin, to which is added the carbolic acid. The proportions of gelatine and glycerin are important, and should be such that the bougie when inserted into the ear readily dissolves. To effect this there should be no more gelatine than is necessary to hold the glycerin in shape. When made they are covered with lycopodium. To use, wash off the powder with a little warm water, stick the end of a pin or toothpick into one end and then slip into the ear. They are very slippery and can be inserted without causing the slightest pain. Stopper the ear with cotton and lay the child down with a lightly filled hot-water bottle over. The bougie soon dissolves and the anodyne effect will last for hours. Furthermore, the glycerin is distinctly curative in that it tends to draw out some serum from within and lessen the tension. A paracentesis may perhaps be prevented.

In connection with any of these external remedies I believe in giving, if there is any fever, from one-eighth to one-half a minim of a tincture of aconite hourly for a few doses, sufficient morphia or opium in some form to in a measure quiet the pain, and a saline cathartic. The pain is apt to be worse at night than in the day, and we must not deceive ourselves and think the attack is over because with the advent of day the patient seems better. Supposing that in spite of all our efforts that the pain still continues, what next? In other words, when is paracentesis to be done? In answer to this question I cannot do better than to quote from Hartmann, who says: "Paracentesis is not indicated in simple catarrh of the middle ear and in cases of moderate pain. On the other hand, whenever the drum membrane is decidedly bulged outward from the pressure of the accumulating secretion, and when this pressure and the continuing fever and pain threaten spontaneous perforation, then paracentesis is strongly indicated. Besides this, it is indicated whenever after the subsidence of the acute pain quite a degree of deafness remains, due to the non-absorption of the retained secretion, the objective examination showing the presence of this secretion." I am sure it is better to do now and then a paracentesis when perhaps the case would have got along without it than to neglect to do one when it is indicated, even though it should happen, as has been claimed, that a serous inflammation is thereby converted into a purulent one through the entrance of germs along the canal. The operation, if done under ordinary antiseptic precautions, is devoid of any danger, and, if there is fluid, invariably relieves the pain. Also, whenever after the acute attack is over there is evidence of an accumulation of fluid in the tympanic cavity, it is better to remove it.

Two recent cases of mine will illustrate this point. A young girl, fourteen, delicate, severe earache several days, anodynes locally and internally. Some adenoids being present, these were removed. Examination of the drum at this time showed some fluid, but not a great deal, and when I saw her in the daytime there was seldom any pain. But nearly every night there was pain; and although I had at first thought that nature would absorb all of the fluid and that paracentesis would be unnecessary, I later concluded to puncture the drum. Some fluid was evacuated; the pain ceased entirely; and the hearing, which had been much impaired, was entirely restored.

Absorption seems to go on very slowly in the presence of much fluid. Remove the fluid, and resolution

then goes on rapidly. The following case will illustrate this: A woman, forty years old, had an attack of acute otitis media. The pain subsided under the skillful treatment of her family physician. A month later, finding that she was still hard of hearing, she came to me. I found the tympanic cavity full of fluid, the landmarks lost, and the drum bulging very decidedly outward. I did a paracentesis, and quite a quantity of fluid came out. The opening promptly healed, but it was two or three weeks before complete restoration of the hearing took place. I think in this instance, that, if the case had been wholly left to nature, there would have been more or less permanent loss of hearing, due to the thickening of the articular surface of the ossicles resulting from long-continued contact with the inflammatory products.

Paracentesis often prevents a serous inflammation from becoming a purulent one, prevents adhesions and permanent damage to the ear. Long-continued suppuration is always productive of harm and is difficult to cure. In an acute case, if in doubt, perforate the drum. The wound heals only too quickly, while the perforation made by nature is a round one eroded on the tympanic surface and slow of healing; the cicatrix is thinner than the rest of the drum and often bound down by adhesions to the inner wall of the tympanum, resulting in a partial loss of its vibratory function. While I believe in conservative treatment, I think were paracentesis done oftener in acute cases that there would be fewer cases of long-continued suppurative ear disease. The operation is not difficult provided one is accustomed to the use of the forehead mirror and is familiar with the topography of the drum. A paracentesis needle, or very small knife, will answer. Have the patient anesthetized unless you are sure he will hold still. Give a few drops of chloroform or ether to primary anesthesia. Cocaine, even in strong solution, only partially takes away the pain. A person perfectly familiar with the operation and able to work quickly can do it without anesthesia other than cocaine, but one who does it but seldom should have the patient absolutely still. Be sure that your illumination is good and that you see just what you are doing; then perforate in the posterior inferior quadrant, parallel with the drum border, carrying the incision nearly to the floor of this quadrant. Be sure that the opening is large enough and that the drum is perforated, not pricked in its outer layer. Syringe the canal with warm antiseptic solution before the operation and stopper the canal with sublimate or iodoform gauze, afterwards replaced as often as soaked through, or gauze or cotton soaked in carbol-glycerin as before mentioned. Keep the wound open until the discharge ceases. If it is not, it may have to be reopened. This can be done with a fine probe or the Politzer air douche. In Politzer's clinic the air douche is used after every paracentesis, but I am in the habit of not using it until a subsequent visit, as a rule. The air then passes readily through the opening and the products of inflammation are blown out. If there is an earache coincident with a perforation, it may indicate that the opening is so small that the secretion does not have sufficient vent, and the paracentesis knife may be needed to enlarge the opening.

The after-treatment consists of daily syringing or wiping dry with cotton, the use of the air douche and the insufflation of a small quantity of aristol with stearate of zinc. This powder works admirably.

The consideration of the possible complications growing out of conditions of which earache is a symptom, or the principal symptom, is beyond the scope of this paper, as is also the consideration of the chronic purulent discharges which often follow acute conditions. A large share of the cases coming under the aurist's care result from lack of treatment or improper treatment of such conditions as I have described; and of all the causes mentioned there are none more productive of permanent damage than the exanthemata, and of these scarlet fever is far the most serious. The most obstinate cases of purulent disease of the ear, those attended with the greatest amount of permanent damage to the tympanic cavity and the function of hearing, occur in connection with, or as sequelæ of, scarlet fever. Too often it is overlooked or paid little attention to until the damage is too great to be more than partially remedied. In my experience, the worst cases of old suppurative ear disease with large perforations, or complete destruction of the drum and one or more ossicles, with foul discharge and considerable caries and granulation tissue, have had their origin in scarlet fever. Affecting as it does the throat and involving the Eustachian tube, there is every opportunity for the disease to invade the tympanic cavity and do much damage there. The same is true, though in much less degree, of measles and diphtheria. In all of these the possibility of injury to the ear should be borne in mind. Any pain which is referred to the ear should be investigated. If there is any deafness during the disease or during convalescence, the cause should be carefully sought for. Fluid in the tympanic cavity should be drained and any resulting discharge properly treated. No case of the exanthemata should be regarded as finished as long as there is any discharge from the ear.

I do not suppose any member of this Society has ever been guilty of telling a parent that the child would outgrow conditions such as I have referred to, although if the testimony of patients is reliable they are often so told. The outgrowing of diseases of this nature is a pernicious fallacy. The children never outgrow them. On the contrary, as the ear remains bathed in pus the pathologic process continues active, threatening all the time the general health and gradually destroying the hearing. When the individual seeks the help of the aurist, it is usually too late to do more than save the remnant of hearing and bring the active suppuration to a close; and even this is not always accomplished, as old adhesions remain. Let me urge upon you the necessity of looking carefully into the aural conditions present in your cases of the infectious diseases and of the exanthemata, especially in cases of scarlet fever, as scarlatinal deafness is much easier to prevent than to cure.

In searching for the causes of an earache the intimate relation between the nerve supply of the ear and the teeth must not be lost sight of, nor the clinical fact that some cases of earache are dependent on dental irritation. Conversely, toothache is sometimes relieved by remedies applied to the ear, especially those remedies containing chloroform. I have already referred to the grippe as a cause of earache. It is a very common cause, a large number of the acute serous inflammations having their origin in this disease. It is much less serious in its sequelæ than the ear troubles incident to the exanthemata, having less tendency to

eventuate in prolonged suppuration. Here, however, the liability of the ear to trouble should be borne in mind.

Clinical Department.

FRACTURE OF THE NOSE COMPLICATED BY A RHINOLITH.

BY TIMOTHY J. REARDON M.D., BOSTON.

COMPLICATIONS are the rule in fractured noses, and consist for the most part either of a separation of the cartilaginous septum, of fracture of the same causing various degrees of obstruction to nasal respiration, of hematoma of the septum, or of abscess of the septum either unilateral or bilateral.

The fracture may also be complicated by its extension into the orbita or by implication of the cribriform plate. Zuckerkandl reports an interesting case in this connection in which there was fracture of the nasal bones with a depressed fracture of the pars ossis nasalis frontis extending into the frontal sinus, and fracture of the ethmoid extending into the orbita and implicating the middle turbinate. The whole thing healed, though with more or less deformity.

Fracture of the processus nasalis of the superior maxilla is infrequent. Fracture of that process is interesting because it usually implicates the turbinates.

A case by Freytag illustrates this: A boy, ten years old, was struck by the clenched fist of another lad. The effect of the blow remained unnoticed for a few days by the boy's parents. Upon examination it was found that the part corresponding to the processus nasalis was occupied by a large swelling externally. Internally the apertura pyriformis was found to be tender and covered with pus. The latter was removed and beneath was a grayish-red mass. Attempts to extract this anteriorly failed; so it was pushed back into the pharynx and expelled by coughing. It proved to be a piece of the lower turbinate. After the lesion healed, very little of the turbinate was to be seen.

A case, reported by Watson, of late necrosis following a fracture, is of interest. Fifteen months after a fracture of the nose, the girl appeared with proptosis accompanied by a nodular swelling at the lower inner angle of the right orbit. She had a sero-purulent discharge from the corresponding side of the nose. A swelling inside the vestibule prevented internal examination. Vision was good and there was no diplopia. A small sequestrum was removed from the lower angle of the eye and the symptoms soon disappeared. I have been unable to find any case similar to the one I now present.

Mr. M., age twenty-eight, was seen by me, June 17, 1897. About noon of that day, while riding a bicycle, he had struck his nose against the temple of the pole rider of a tandem coming from the opposite direction. Both machines were moving rather slowly at the time. The patient immediately experienced considerable pain about the bridge of his nose: a profuse epistaxis began and continued until he was seen by me four and one-half hours later; it was then only moderately severe. Externally there was considerable swelling about the root of the nose and under both eyes. A fine crepitus could be felt caused