its farewell of the patient. There has been so much exhaustion that progress, when uninterrupted, has been very slow — especially in elderly and feeble patients. Many patients have sent for their physician merely to ask, "Why don't I improve more rapidly?" but the delay in recovery does not seem to depress them so much it as did last year, and they are not unhappy, when they are told they must be content, with a slight gain from week to week.

Prognosis, like everything else connected with influenza, has been uncertain. Many of my cases have turned out unexpectedly well, the danger which seemed imminent from threatening cardiac failures and intense prostration having generally been overrated.

In Regard to Treatment, I wish to say but one word — in favor of oxygen in the acute pulmonary affections of the asthmatic type.

OPERATIVE TREATMENT FOR THE RELIEF OF CHRONIC SUPPURATIVE AFFECTIONS OF THE MIDDLE EAR: REPORT OF THREE CASES.¹

BY FREDERICK L. JACK, M.D.,
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CHRONIC suppurative inflammation of the attic of the tympanic cavity may justly be considered a serious trouble. Especially is this true if the disease begins during childhood and continues for a long period. In many instances caries of one or more of the ossicles, is present, with or without disease of the bony walls of the attic, and the small space in the cavity is crowded with granulation-tissue or polypoid growths, causing defective drainage and consequently retention of septic matter. Exacerbations are in many cases frequent, and at these times the possibility of extension of the middle ear inflammation to the meninges of the brain or mastoid antrum in a constant source of danger. In the majority of instances the hearing power is practically gone, but a point of far greater importance is the danger to life itself. Indeed, a fatal termination is to be expected in a considerable number of these cases. In the light of what has been demonstrated within a few years, and realizing the possible effect of neglecting or ineffectually treating such a trouble, does it not seem somewhat surprising that the disease is allowed to progress unchecked when surgical interference has proved very successful in the majority of instances? The result of the operation has been either rapid cure or at least such improvement as to make the disease amenable to after-treatment.

I desire, therefore, to call attention to what has been done in aural surgery towards the relief of this class of almost hopeless cases. I believe it to be of general interest, for the rule of procedure is the common-sense surgical one of removing diseased bone or whatever obstruction is found to free drainage.

As far back as 1877, Dr. Kessel, of Jena, published the report of a case in which he removed the drum membrane, malleus, incus and stapes.² He cited this case to show that the ossicles could be removed without danger. As to the pathology of the affection, Professor S. Moos, of Heidelberg, is of the opinion that the hammer is most frequently affected, and that often before caries can attack the anvil, it is exfoliated,

being loosely held in place by the adjoining ossicles and tissues. The stapes is most rarely affected. He further states that he has never observed or seen described a case of primary caries of these bones; that the mucous membrane must first be diseased before caries can attack the ossicles.³

On July 20, 1886, Dr. Samuel Sexton, of New York, in a paper read before the annual meeting of the American Otological Society, described "A New Operation for the Radical Cure of Chronic Purulent Inflammation of the Middle Ear Tract." Previous to that, a paper written by Dr. Schwartz, in 1885⁴ gives a *résumé* of the literature of operations on the transmitting mechanism of the ear. Since that time the application of this line of surgery has developed very rapidly.

I have endeavored to summarize the results in the few recorded cases since Schwartz's paper in 1885; and I add the report of three cases operated upon by myself for chronic suppuration of the middle ear.

In 1887 Dr. Sexton reported nineteen cases of this disease, with results as follows: In five cases a cure took place in less than one month; in two cases, in two months; in two cases, in three months; in one case, in six months. In five cases, still under observation, there was slight improvement; in three cases⁵ still under observation, there was no improvement; in one case the treatment was not continued. He does not mention in any case the duration of the otorrhœa, except in a general way, that it had long continued. The malleus alone was removed in six cases and the malleus and incus in ten. He estimated that the hearing power was increased from 75 to 100 per cent. in the cases cured.

Dr. Burnett, of Philadelphia, before the American Otological Society last July, reported a case of seven years' duration in which he excised the drum membrane and malleus. In thirteen days the discharge from the ear ceased. Three months from the time of the operation a cicatricial membrane was found over the promontory. No discharge. Hearing increased from nothing to whispered words at fifteen feet.

In my search for information as to the frequency of purulent inflammation of the superior portion of the tympanic cavity, I found, in a paper by Dr. Alexander Randall, of Philadelphia, "Notes on the Shrapnell Perforation,"⁶ a total of 120 cases among ten thousand patients — somewhat small number. If, however, to this number is added those cases with perforation of the drum membrane, my impression is that the number would be largely increased.

From 1885 to 1890 inclusive, there were treated at the Massachusetts Charitable Eye and Ear Infirmary for chronic purulent middle ear disease 3,795 cases out of 21,818 patients applying for treatment. Among 8,337 of all cases seen in the last two years, from 1889 to 1890 inclusive, there were noted 1,020 patients with chronic purulent trouble, and of these 94 cases of perforation of the flaccid membrane, — almost 10 in every 100 cases. This is practically the same ratio per thousand for all ear patients as that reported by Dr. Randall, and illustrates the relative frequency of this affection in suppurative middle ear disease.

Although without statistics to substantiate any fig-

³ Archives of Otol., March, 1885.

⁴ Deutsche Chirurgie, Stuttgart.

⁵ In two of these cases suppurative inflammation seemed to continue in one because of caries of the anvil, and in the other in consequence of the retention of the incus which could not be found.

⁶ American Otological Society, 1890.

¹ Read before the Boston Society of Medical Observation, March 7, 1892.

² Archiv. f. Ohrenheilk., vol. xlii.

ures, my memory leads me to believe that in a large proportion of the cases of suppuration, under my observation, the disease was confined to the attic or superior portion of the tympanic cavity. Most of the writers on this subject have advised the removal of the drum membrane together with the diseased ossicles. As the membrane forms a natural protector of the tympanic cavity I am impressed with the importance of exposing as little as possible of the mucous membrane to the effect of cold or what by chance may find its way into the ear. The cicatricial tissue closing the opening has been shown to form in many instances a vibrating surface capable of transmitting its movements to the stapes. Where the incus remains, its long process, through contact with this tissue, increases the hearing power, and in a measure also protects the delicate mucous membrane beyond. In my limited experience with this operation, but somewhat wider observation of the work accomplished by others, I have failed to find any evil effects which could be attributed to the operation, whereas the results obtained, both as regards effecting a cure and improving the power of hearing, have been extremely favorable. I believe that in all these cases every effort had been previously made in the way of both vigorous and mild treatment. I wish, however, in no way to be understood as advocating operative interference even when rough bone is demonstrated until the usual treatment has been thoroughly tried.

I might say in regard to the instruments necessary for the operation, that a series of triangular-shaped knives, bent at various angles, seemed sufficient for most of the tissues necessary to be separated. A case of Schwartz's curettes enables the walls of the attic to be cleared of granulation-tissue, great care being necessary in case of caries not to enter too far, the anatomy of the parts to be kept clearly in mind all the time. The ear must be perfectly illuminated, during the operation. In addition, a small pair of ear forceps for removing the completely excised ossicles is especially to be recommended, as it is more easily directed by the hand and less likely to do harm by undue force. A small olive-tipped probe is very necessary in determining the location and extent of the disease. A small hook is also useful in finding any adhesions which may remain after the operation. They should all be separated before attempts are made to remove the ossicles. All antiseptic precautions were carefully observed. Cocaine has proved a valuable aid in clearing from bleeding the very small field of operation. For the steps in the operation there is little I can add to the description given by Dr. Kessel⁷ or by Dr. Sexton.⁸

The house records of the following three cases occurring at the infirmary during my service for Drs. Green and Blake briefly illustrate what has been said:

CASE I. Mrs. M. F., forty-two years old. Has had a chronic, purulent discharge from the right ear for forty years, during which time it has never wholly ceased, considerable tinnitus. No pain, advised to enter the house for operation. Examination of the patient showed a slight discharge from the ear. Large perforation of the membrana tympani. Head of malleus rough to the probe and adherent to the promontory.

September 10, 1891. Patient was etherized and the malleus freed from all its attachments, which were

very firm and dense around the head of the bone and handle, and then removed with forceps. The ear was thoroughly syringed with a corrosive sublimate solution (1 to 2,000), and tightly sealed with absorbent cotton and a collodion dressing applied. Examination of the malleus revealed caries of head and short process. Most of the manubrium had sloughed away.

September 14th. There had been no pain since the operation. Dressing removed for the first time. The ear was found absolutely free from all discharge. Evening temperature 99° for three nights, normal the rest of the time.

September 16th. Ear perfectly dry. Meatus kept closed with antiseptic cotton.

December 5th. At the end of nearly three months, middle ear found dry and the mucous membrane white in color. Hearing greatly improved for conversation. W=78. No tinnitus.

CASE II. Miss L. V., about fourteen years old. On November 11th she entered the out-patient department for the relief of an otitis media suppurativa of the left ear, which had lasted for several years. Malleus was carious and had a large polypus growing from the handle. Bone very loosely held in place and partly destroyed by necrosis. Under ether, the malleus and polypus were removed with the snare and a few granulations in the upper part of the middle ear cavity were curetted. The meatus was then closed with cotton after being syringed with a corrosive sublimate solution (1 to 3,000). Evening temperature 100°.

November 12th. Considerable foul-smelling discharge from the ear. The patient was unable to bear the removal of the granulations so they were touched once a day with perchloride of iron. Syringed with a 1 to 5,000 solution twice a day, and followed with instillations of resorcin and alcohol. Temperature 99°.

November 16th. Amount of discharge much less. Referred to out-patient department; since that time nothing has been seen of her.

CASE III. Miss L. C. B., thirteen years of age. Had been troubled with chronic purulent discharge from the left ear for ten years; at times annoyed with dizziness. Examination showed patient in poor general condition and anæmic; large destruction of the posterior segment of the drum membrane; malleus firmly adherent to the promontory; and the probe revealed a small spot of necrosis on the anterior edge of the handle of the hammer. Granulations were found covering an area of diseased bone on the inner wall of the middle ear cavity posterior quadrant.

October 1st. The patient was etherized, and an operation of half an hour performed. Malleus removed after some considerable difficulty, due to thick bands of tissue around the head of the bone. The granulations on the inner wall were curetted. Collodion dressing applied.

October 2d. Rallied from the ether well. Complained of some headache and slight pain in the ear. Temperature 99.8°.

October 3d. Dressing removed, and middle ear found filled with foul pus. Syringed three times daily, and powdered with iodoform. Evening temperature 99.5°.

October 5th. Discharge less. Slight headache and no pain in the ear. Temperature normal.

October 12th. Amount of discharge is very small. Ear wiped dry, and powdered once in two days.

⁷ Archiv. f. Ohrenheilk., vol. xiii.

⁸ Transactions of the American Otological Society, 1886.

October 17th. Ear perfectly dry in the superior portion. After omitting treatment for ten days, slight moisture only over spot of necrosis in lower portion of the tympanic cavity. No change in hearing.

January 2, 1892. Ear without discharge. No complaint of dizziness. Hearing the same as before the operation.

In Case III healing was delayed by the condition of the bone concealed by the granulations on the inner wall of the tympanic cavity, although curetted as thoroughly as possible. All discharge disappeared from the attic in a few days after the operation. In contrast to this case is the one reported first, in which, in spite of the long continuance of the suppuration, the ear healed almost immediately after removal of the carious malleus. I think the two cases illustrate the two classes into which suppurative processes in the middle ear may be divided, considered from the point of time necessary for recovery after the operation. First, I would class as simple cases those in which necrotic bone is confined to one or more of the ossicles, the bony walls of the middle ear cavity being perfectly free from such a disease; second, as complicated, those cases in which some part of the bony wall, together with the ossicula, is diseased. The most speedy cure may be very naturally expected after operation in the first variety of cases, for the simple reason that everything interfering with recovery is removed. Experience has shown that the ears heal almost at once without subsequent treatment being necessary. In the second class of cases healing is necessarily delayed, depending largely upon the seat of the diseased bone in the tympanum.

Removal of the ossicles and the membrana tympani will not cure every case of chronic otorrhœa; but I am certain that many may be cured and the rest relieved by operation. Of the cases mentioned in this paper (twenty-three in all), twelve were cured in three months or less time; one in six months; five cases were improved; three cases were not improved and two passed from observation. As every variety of local treatment in most of the cases had previously been faithfully tried, it seems to me that the results of the operation have been most satisfactory, and that from the cases reported we may draw the following valuable conclusions:

(1) The removal of the drum membrane and ossicles is attended with little annoyance to the patient, proof of which is sufficient to warrant the performance of the operation as the only means of cure in many cases.

(2) The operation often produces marked improvement of the hearing.

(3) Satisfactory results may be expected towards the relief of tinnitus and vertigo.

(4) The results of the operation seem to be permanent.

Although not the chief purpose of this paper, I am tempted at this point to speak of operations on non-suppurating ears. The possibility of hearing well without the membrana tympani, malleus and incus has been successfully demonstrated in a number of cases; and this suggests what operative procedure may be expected to do in some cases of deafness due to hypertrophic catarrh of the middle ear without fixation of the stapes. The distressing symptom of tinnitus has been relieved by the same operation. It has also been done with success in certain cases of disturbance of

equilibrium from pressure transmitted through the middle ear. There are a few cases recorded in which the hearing has been in good part restored by removal of the membrana tympani and one or more of the ossicula. The successful operations have, however, been as yet too few to enable us to establish a rule.

A CASE OF EMPYEMA WITH RECURRENCE AFTER APPARENT RECOVERY.¹

BY S. H. AYER, M.D.

EARLY in the morning of January 4, 1890, I was called to see Mrs. P., when I obtained the following record. The patient was twenty-five years old, married, and had a good family history. Had had scarlet fever when a child. About nine o'clock in the evening of December 31st she was seized with the grippe. The following day symptoms of miscarriage began to show themselves, she being six months pregnant. The patient finally miscarried at eleven o'clock in the evening. She was attended by a homœopathic physician. Patient remained comfortable until the morning of January 3d, at which time she was seized with extremely sharp cutting pains throughout left chest accompanied by much dyspnœa. The pain continued throughout the day and night, and as the physician in charge gave nothing that seemed to afford any relief, the husband decided to change doctors, and I was accordingly summoned.

It was 4.30 A. M. when I arrived at the house. The patient was apparently suffering intensely, and was in a very much exhausted condition. Pulse 120, temperature 101.4°, respiration 40. A hurried physical examination of the chest showed flatness with bronchial respiration in lower half of left back. A quarter of a grain of morphine was given by the mouth, and a poultice of mustard and flaxseed applied to whole left side, back and front.

At 8.30 A. M. I returned, and found that the patient had been dozing since six o'clock. Morphine, one-eighth of a grain, had been given twice during my absence. Lochia scant, whiskey and digitalis were ordered. Pulse 128. At 5 P. M. the pulse remained the same, respiration 32. Patient was very drowsy, and pupils were somewhat contracted. There had been no pain to speak of during the day. Numerous fine moist râles were heard in the lower half of left axillary region.

January 5th. Pulse 112, temperature 100.8°, respiration 36. Pain in side was gone. Took nourishment well through the night. The cough and expectoration were very slight, the latter being thick and tenacious. The tongue was moist and had a thin whitish coat. Patient complained of pain and tenderness in hypogastric region, the knees being drawn up. At 5 P. M., pulse 126, temperature 102.4°, respiration 36. There was marked tenderness over the uterus and also in both iliac regions. Vaginal examination found the passage hot, os somewhat open, moving of uterus painful. Lochia somewhat scant and slightly offensive. Iodoform was applied to vaginal outlet and the pain was controlled by morphine.

January 6th. Pulse 124, temperature 101.8°, respiration 28. Patient feeling much better. Abdom-

¹ Read before the Boston Society of Medical Observation, March 7, 1892.