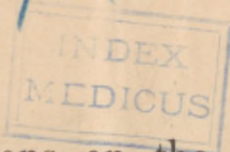


Bishop (S. S.)



Operations on the Drum-Head  
for Impaired Hearing; with  
Fourteen Cases.

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## OPERATIONS ON THE DRUM-HEAD FOR IMPAIRED HEARING; WITH FOURTEEN CASES.

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I will not occupy the time of the Section with a historical account of this operation, although it is replete with interest. Those facts only will be presented which are necessary to an intelligent study of this group of cases. The subjects for operation were not selected with a view to the promising nature of their cases. This method would have been more brilliant but less scientific.

If I have erred at all it has been in the opposite direction. For the purpose of making a crucial test of the efficacy of this procedure, I have made it the last resort in those cases which afforded no hope for relief from any other treatment. Perhaps the propriety of operating on those patients that seemed to promise, no results might be questioned, were it not for the facts that in nearly all of them there was an unexpected improvement, and that no unfortunate consequences followed the operation. The cases I have chosen to operate on were far more hopeless than those with chronic suppurative inflammation. The consideration that the former respond so little to our efforts, while the latter are so amenable to treatment with inflations, cleansing, peroxide of hydrogen, boracic acid, bichloride of mercury, etc., with the result of not only arresting the disease, but of improving the hearing, has led me to seriously contemplate the advisability of establishing the suppurative process in proliferous inflammation of the middle ear. In but three cases in my practice has this condition followed the procedure under discussion, and

I have operated more than one hundred times. It happened while I was preparing this paper. A temporary purulent discharge occurred immediately after the operations. It had the effect of keeping open the apertures, and no evil consequences followed.

In choosing the location for the incisions I have usually given preference to the section of membrane anterior to the handle of the malleus, in order to avoid the possibility of wounding the carotid artery, should the bony wall of the carotid canal be deficient, or of penetrating the labyrinth through the fenestra ovalis.

Cocaine in a four per cent. solution was employed as a local anæsthetic in very sensitive individuals. It allows sufficient deliberation on the part of the operator, for patients experience no actual pain, although they feel the knife.

Chronic non-suppurative inflammation of the middle ear existed in all of the following cases.

*Case 1.*—Male, 43 years old, on Board of Trade. Said he had not been able to hear with the right ear for many years. He consulted me relative to a sudden attack of sub-acute inflammation of the left middle ear and Eustachian tube. The right drum-head was thickened, opaque, and retracted. The handle of the malleus was fore-shortened and the processus brevis prominent. There was no hearing for the watch even by bone conduction, but the tuning-fork could be heard by aerial conduction close to the auricle. I advised him to submit to an operation; but as he had no hope of receiving any benefit for his worse ear, and requested me to direct my efforts toward the better ear only, to save what hearing he had, I contented myself at first with the ordinary treatment addressed to both ears. The left ear improved rapidly, while the right remained unaffected. Before discharging him I instilled a warm four per cent. solution of cocaine into his right ear, and at the expiration of twelve minutes made a free opening in

the anterior half of the membrana tympani, with Politzer's paracentesis knife. He was not conscious that any cutting was done, and gave no evidence of any unpleasant sensation, except by the remark that "The funnel seemed to press against the ear." The immediate result was that he heard my watch on contact with the auricle, and the tuning-fork five inches distant. He said it was the first time in many years that he had heard a watch with that ear. April 29th he could still hear the watch with that ear.

*Case 2.*—Deaf mute, German farmer boy, 19 years old, came under treatment in September, 1885, during my service at the Illinois Charitable Eye and Ear Infirmary. There was no sign of any perception of sound either by aerial or bone conduction with either ear. I placed him on a course of treatment addressed to both the middle and internal ears. For the former I employed catheterism at first, and the Politzer method later, as the Eustachian tubes became more pervious. For the purpose of imparting tone to the auditory nerves, I employed central galvanization daily. After four months of persistence in these methods, the only apparent improvement was his ability to hear the tuning-fork as it vibrated in contact with the mastoid process of the right side. I repeatedly tested his hearing in the presence of others, but he was unable to hear loud clapping of hands immediately behind the auricles.

January 28th I opened both drum-heads, leaving elliptic perforations which remained open two or three days. My record book shows the immediate result to have been as follows: Patient hears the loud voice through the conversation tube, but does not understand words. He makes an effort to reply, but the result is only unintelligible gibberish. In speaking to him through the tube, care is taken to prevent him from watching the lips, for he has acquired some proficiency in lip-reading. He repeats the vowel sounds with more or less accuracy; and if

given an opportunity to watch the relative positions and movements of the lips, tongue and teeth, he reproduces the sounds with surprising fidelity.

February 1st, the aperture having closed, I opened the right membrane. Patient hears ordinary conversational tone through the tube, repeating words.

February 8th, made long openings in both membranes. I have taken pains to exercise the auditory apparatus by using the vowel sounds and the powers of the consonants separately. He says he hears better with both ears, and seems to appreciate various sounds with greater nicety than before.

February 11th, 17th, and 27th, opened both drum-heads. Patient says he hears my watch on pressure with right ear, and imitates the ticking. He hears the fork close to the right meatus. At the last operation I made two incisions in such a manner as to leave triangular openings. I waited nearly a month before operating again, continuing the inflations and galvanization. The perforation on the left side had then closed, but on the right it remained open.

March 25th, made long aperture in both drum-heads. Hears watch on contact, and fork one inch, with right ear.

March 30th, operated on both drum-heads, making two incisions in each, so as to embrace large triangular portions of the membrane. He is now able to construct and utter sentences of considerable length quite intelligibly.

Encouraged by the improvement in the preceding case, I adopted the same course of treatment in the following one. It is in striking contrast with the first, and illustrates the impossibility of predicting results.

*Case 3.*—Farmer, 25 years old. December 11th, 1885, said he had been losing his hearing for "a number of years." There were evidences of disease of the labyrinth, but no syphilitic history could be elicited. Neither the watch nor fork was heard by bone

conduction with either ear, but he could hear the fork one inch from the right meatus. There had never been any tinnitus aurium. His treatment was exactly the same as in Case 2. Central galvanization and inflations failing to accomplish anything for him up to January 27, 1886, I opened the right drum-head, with no result.

February 3d, operated on the left one, with no improvement.

February 12th and 17th, and March 4th, operated on both drum-heads. When I discharged him he said there was no perceptible change of any kind in his condition.

*Case 4.*—Brought for consultation by Dr. Bennett, from Richmond, Illinois, on February 5, 1886. The patient was a young woman 19 years old, and had suffered for "several years." The tympanic membranes were thickened, opaque and retracted. She could not hear the watch, and could hear the fork only when in contact with the mastoid process. Symptoms were present which pointed strongly to labyrinthine disease. No satisfactory results had attended the ordinary treatment. I made free openings in the drum-heads with the immediate result that she heard the fork at a distance of ten inches from either ear. The patient returned home with her physician, who promised to keep a record of her case and report the results to me.

March 23d I received a letter from Dr. Bennett in which he stated, after referring to my operation, that "Since then I have punctured one drum-head twice and the other once. She seemed better after each puncture, but now has reached a stationary period where she does not improve. I am inflating the middle ear with the catheter once a week, and applying the galvanic current. What would you further advise?" etc.

*Case 5.*—Cooper, 36 years old. Has had great tinnitus in both ears for two years. The drum-heads

were opaque, thickened and retracted. Hearing for the watch was on pressure for the right, nil for the left. Fork was heard one-fourth inch from the right ear, and on contact with the left mastoid process. After the operation he could hear the watch two and one-half inches, and the fork ten inches with the right ear, the the watch seven inches with the left. The tinnitus ceased in the right ear and diminished by seventy-five per cent. in the left.

*Case 6.*—Woman, æt. 42. Has suffered greatly from noises in both ears. Heard watch on contact with the right ear, and on pressure with the left.

February 18th, opened both drum-heads. Watch was heard two inches from the right ear. Hearing remained the same as before in the left, although she thought it was better. The tinnitus, which was increasing before, now intermits, and is less annoying.

February 20th, hears watch two and one-half inches from right ear. Hearing unchanged in left ear. Tinnitus diminished in both.

February 27th, hearing distance for watch on right side, a little more than five inches. No change in left ear. Tinnitus less in both. The improvement in the hearing distance for the right ear was more than 500 per cent.

*Case 7.*—Woman, 50 years old. Proliferous inflammation of long duration. Hearing for watch on right side, nil, on left side, pressure; for fork on right side, one-half inch.

March 28th, opened both drum-heads; immediate result, nil.

March 29th, both apertures remain open. Hears fork four inches from right ear, and watch on contact with left. The improvement in the right ear was 800 per cent.

*Case 8.*—A woman about 40 years old came from the country for consultation. She attributed her trouble to the use of quinine. Said she had taken it during a year for intermittent fever, which she had



about fifteen years ago. Ever since then her ears have rung constantly. She had typhoid fever nine years ago. The group of symptoms were characteristic of proliferous inflammation. Hearing for watch was on contact for the right ear, one-eighth inch for the left. I opened both membranes, whereupon she heard the watch one-eighth inch from the right, and one-half inch from the left. The tinnitus had diminished.

*Case 9.*—Iron worker, 45 years old. Hearing of the right ear for watch, nil; for fork, at rim of auricle. Hears watch in left ear on pressure, and fork, one inch. Operated on right ear, with the immediate result that he heard the fork one-half inch distant. Two days later the hearing had improved so much that he heard the fork two inches from the auricle, and the snapping of the nails six inches.

*Case 10.*—Horseman, 50 years old, whom I had treated several months in the South Side Free Dispensary, by catheterism and Politzer's method, without any perceptible permanent improvement. The drum-heads were greatly thickened, and densely opaque. The manubrium was much foreshortened, and there were cretaceous deposits in both membranes. As in many such cases, there was a chronic naso-pharyngeal catarrh which was quite intractable. There was absolutely no hearing for the fork or watch. The disease had evidently invaded the labyrinth. Although there appeared to be no reason to expect any improvement, since I had never witnessed any ill consequences following the operation, I opened both drum-heads. It was like cutting through leather, so thick and hard and tough were the membranes. The chalky deposit imparted a grating sensation to the fingers that held the knife. He strongly insisted that the operation not only improved his hearing, but relieved the uncomfortable sensations in his head. No later history was obtainable.

*Case 11.*—Laborer, 51 years old. Had tinnitus of

long duration. There was inspissated cerumen in the left meatus when he presented himself at my clinic at the Infirmary in July, 1885. Hearing for the watch then was one-fourth inch for the right ear, and pressure for the left. After eight months of the usual treatment the hearing distance had increased by four times the original distance in the right ear, and from bone to aerial conduction, at one half inch distance, in the left. But there it remained without further progress until March 29, 1886, when I opened both drum-heads with triangular apertures. Immediately the hearing distance was increased in the proportion, in the right ear, of two to seven, and in the left ear it was doubled.

*Case 12.*—Man, 27 years old. Had a fall when four years old and alighted on the left parietal eminence. Says he has been deaf in the left ear ever since. Has had noises in both ears for eight years. Inspection revealed proliferous inflammation in both middle ears, and I strongly suspect that there had been a fracture of the temporal bone, extending through the left tympanic cavity. There was no hearing for the watch, and the fork could be heard only when vibrating loudly on either mastoid process. I made large openings in the drum-heads, whereupon he could hear the fork by aerial conduction one and one-half inch from the right ear, and one inch from the left. The tinnitus remained undiminished.

*Case 13.*—Old soldier, 54 years of age. His affliction dates from the battle of Pittsburgh Landing, where he was precipitated by the explosion of a shell. Thus his disease is over twenty years old. There was no hearing for the fork. The inflammation was of a proliferous type, and the auditory nerves were diseased, beyond a reasonable doubt. There were noises in both ears. As there was no improvement from the usual treatment, I opened both drum-heads, merely to see what the result would be. It seemed to have no effect on the right ear, except to diminish

the tinnitus, but he was able to hear the fork close to the tragus on the left side. Four days later the tinnitus had ceased, and the hearing remained the same for the fork. He repeatedly assured me that he could hear better, and said his "head felt clearer and better" for the operation. He said he could hear some with the left ear. I doubt it. I saw the patient several times subsequently, and to my surprise, when I last saw him, he retained the improvement he had made.

*Case 14.*—Swedish workman, 35 years old. Had tinnitus one and one-half year in the right ear, and two and one-half in the left. No hearing for watch. Fork heard one-half inch from right, and one-eighth inch from left ear.

March 29th.—I made large openings in the membranes, after which he could hear the watch on contact with the right ear, but not with the left. Hearing for the fork was increased just fourfold for both ears. The tinnitus was diminished.

March 30th.—The hearing was five times better in the right ear, and eight times better in the left, than it was just after the operation, and the tinnitus was further decreased.

April 22.—Hears watch one inch with the right ear, and on contact with the left. Tinnitus is diminished by one-half in the right ear, but remains the same in the left. I operated on both ears again, whereupon the hearing was less acute, and the tinnitus was diminished.

April 29th.—Hearing for the watch was one-half inch for the right ear, and contact for the left. There was slight tinnitus in both ears.

The watch employed for testing the hearing can be heard sixty inches by the normal ear, and the tuning-fork is of ordinary size, pitched at *a* above middle *c*.

In recapitulating it will be observed that only two out of these fourteen cases were under 25 years of

age. One of these was a deaf mute and the other presented symptoms of labyrinthine disease. All except two of the remaining twelve were 35 or older. Four were 40 or more, and four were 50 or over. The average age was above 38 years. It should not be forgotten that the conditions for which these operations were performed were among those generally regarded as the most hopelessly incurable that ever confronted an aurist. Notwithstanding this, thirteen out of the fourteen cases were more or less benefited, and some were improved by not less than 500 and 800 per cent. How permanent this improvement may prove to be remains for the future to determine, I give the facts as far as they are in my possession.

The history of these cases has been brought down to as recent a date as the nature of circumstances would permit. I have examined and operated on some of them within the last week. I have had as yet no reason to regret the operation, and in some cases of this group, as well as in others which there is not time to report at this meeting, the improvement has been greater than I was prepared to expect. I shall follow up the history of all cases as far as possible and record remote results. My object in operating was to cause cicatrices in retracted drum heads, for the purpose of restoring their normal tension through contraction of the cicatricial tissue. But when the loss of hearing seemed to be due largely to the interposition of a thick, dense, unyielding drum head between the source of sound waves and the perceptive apparatus, I attempted to maintain a permanent aperture.

In conclusion I must say that the happy results obtained in the majority of cases in which I have operated, and the fact that no ill consequences have followed the operation, have convinced me that the procedure is advisable in the class of cases I have

selected. It improves hearing, and sometimes relieves distressing noises and other subjective symptoms when nothing else will.

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