

PRELIMINARY REPORT OF THE IMPROVED TECH-  
NIC OF THE THIERSCH GRAFT FOLLOWING  
THE RADICAL MASTOID OPERATION.\*

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In a preliminary report of the improved technic of the Thiersch graft following the radical mastoid operation, it is very essential that the operation be done in a very thorough manner.

Every individual cell is destroyed until hard bone is encountered, or the dura, sinus or nerve uncovered. This final destruction of cancellous bone is best accomplished with a hand burr. It may be done with a burr driven by electricity; however, I prefer such burr for the bone of greater density. It is very essential that all the uneven surfaces be made perfectly smooth.

The outer part of the bony meatus must be removed sufficiently to be on a horizontal plane with the floor of the tympanic cavity. The posterior bony wall must be cut down to the floor of the newly made bony meatus. By this procedure more room is gained and the pocket which was formed by the tympanic cavity has been eliminated. In the removal of the posterior bony meatus and facial spur, great care must be exercised in not injuring the facial nerve. This is best overcome by chiselling the wall away with large chisels and working parallel to the nerve, so that in the event that the nerve is uncovered, it would not be cut. This particular point will enable the operator to remove more bone than any other, with more safety to the facial—in fact the facial cannot be cut by an experienced operator.

The mucous membrane of the tympanic cavity must be

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entirely removed. I literally mean that after a very thorough inspection, none can be detected.. At this place it will be necessary in most cases to use a hemostatic agent of some kind, as hot saline solution, peroxid of hydrogen or adrenalin.

Most careful attention must be directed to the tube in order to remove the mucous membrane thoroughly.

The tympanic wall should be so thoroughly removed by chisel and made smooth by burrs, that the small searchers of Jansen's will not be arrested.

Everything that has been said so far is absolutely important in every radical operation. However, it is much more important when Thiersch grafts are to be applied, as any infection that may remain in the bone will ultimately destroy the graft and the purpose will fail of accomplishment.

The Neumann plastic should be made in preference to all others for this particular procedure, the upper and lower flap sutured in place, and the point of the V sutured to the auricle. The sutures to be used in holding the V part of the plastic should be catgut. The sutures for the upper and lower flap are best of catgut; if not, they must be removed when the skin-graft is applied.

The use of other sutures, if allowed to remain, may or may not cause trouble in the after treatment of the case.

The toilet of the operation having been completed, the patient is put to bed and is encouraged to go about as soon as possible. Four days following the radical ear operation, the Thiersch grafts are applied, this particular time being selected because the granulations are comparatively small; in some cases they are quite large. I have used the grafts earlier, but of late I have selected the fourth day as the best for all cases. In the near future I am going to use this same procedure in detail at my first operation. On the fourth day, patient being anesthetized, the operative field is cleaned in the usual way. The whole cavity will be found covered with granulations, all of which must be most carefully removed, special attention being directed to the tube. At this time I use hot saline solution as a hemostatic agent, inspecting the cavity from time to time; finally to reassure myself, I use peroxid of hydrogen several times. When I am satisfied beyond a question of doubt that everything is away, I put in gauze saturated with adrenalin; this gauze is held in the cavity

under pressure by an assistant while the grafts are being prepared. At the time I begin my preparation of the ear, the nurses are preparing the leg or part from which the grafts are to be taken. In this preparation, bichlorid has never been used. Sterile salt solution is used in excess, following all the other aseptic procedures.

I try to get about three or four grafts one-half inch wide by one and one-half inches long. Some smaller ones one-fourth inch by one-half inch. Some of the grafts may be lost in preparation or in applying them.

The grafts are taken from the razor directly to the Jansen spatula, and after all edges are straightened they are put aside for use. When grafts are in readiness, the adrenalin tampon is removed from the ear. The cavity will be found to be absolutely dry, and if not, more adrenalin must be used; the cavity must be free from oozing blood or the grafts will not adhere.

The first one is fastened with a searcher into the tube, bringing it out over the floor of the tympanic cavity posteriorly. The second, superior to the first, brought back over facial into mastoid cavity. The third usually covers the remaining wall of the attic and antrum. The three that have been used are the larger ones. The uncovered areas that are now left are covered by the remaining grafts, the one being selected that will cover the denuded area best. Small pledgets of cotton are now used to fix the grafts,—they must be so small that they do not touch either surface while being put in place. The first one is put over the tube; the second firmly applied to the posterior inferior quadrant, the next over the stapes, and so on until all the grafts are held well in place so they will not be materially disturbed when a dry tampon is introduced. The size of this tampon will correspond to a piece of gauze four or six inches square. After the dry gauze, a similar piece of gauze is saturated with oil of vaselin, and packed within the mastoid cavity; after this a similar piece, in size larger or smaller as the occasion may demand, to fill the entire cavity made by the operation.

The posterior wound is now closed in the usual manner. It will be found that an additional tampon by way of the meatus will assist materially in holding the plastic in the way intended, resulting in a very large meatus, with cut surfaces

all within the ear. This materially adds to the comfort of the patient as well as preventing a contracted meatus. The outside dressing is as usual. The ear tampons are removed on the fourth day. If there is any difficulty or pain in the removal of the tampons, contrary to the ordinary teachings, peroxid of hydrogen may be used in excess to soften and loosen the tampons, and stop the bleeding, so that the small cotton fasteners that are put in to hold the grafts in place may be seen and taken away.

In 50 per cent of the cases a white cavity will be seen; in fact this is always the case when time is taken to stop the bleeding that comes from the inner surface of the soft parts that have been sutured and could not be covered by graft. This is the improved technic of the Thiersch graft in the radical ear operation.

In fact a graft never adheres to the tampons so as to be torn from its attachments. I say attachments, because I purposely pulled one away for experimental purposes; it was so firmly attached that the ordinary Politzer ear forceps would slip off. I was compelled to use an anatomic forceps and hold with considerable strength in order to pull the graft away.

In some of the cases the outer layer of epidermis would loosen; this occurs in ten days or two weeks after the grafts have been applied; they always leave a delicate epidermis that hardens in a very short time. I hardly know how to account for the fact that in some cases the entire graft remains in place while in others the outer layer comes away. The only explanation that I can offer is that in some instances the graft is too thick. However, this does not seem to be serious, as the cases heal in about the same time. Occasionally it will happen that granulation tissue makes its appearance when the edges of the graft are not in perfect apposition. They are very easily destroyed with the ring knife. At the following dressing the denuded area will be found completely dermatized.

Occasionally excessive granulation tissue makes its appearance posteriorly in the region of the plastic. This is removed with curette and packed tight with gauze saturated with sterile oil of vaselin. Contrary to the teaching of today, bichlorid of mercury is used to irrigate the cavity. This is

necessary where there is an unusual amount of pus or odor from secretion. In other instances where there is more debris than there should be, I always irrigate with the intratympanic canula and under inspection, so that the force of the stream is directed to the particular spot that requires attention. I also irrigate with normal salt solution and boracic acid.

As has been said before, the oil dressing is removed in four days or sooner if necessary. In two days a second dressing is made which includes an irrigation of bichlorid of mercury 1-3000, and from this time on it is dressed daily until complete recovery.

It is necessary to use the bichlorid irrigation at the second dressing to remove disagreeable odor that is caused by the oil of vaselin becoming rancid. This happened in all my cases, however, and I did not care to make a change until this report had been made. In a case operated upon a few days ago, I used  $\frac{1}{2}$  per cent solution of carbolic acid in paraffin oil, U. S. P., and to my surprise, there was no odor; besides, the mastoid cavity was in better condition than in any of my previously operated cases. In fact the case is so near well in two weeks, that it is difficult to find uncovered areas. I believe this antiseptic added to the oil will further materially improve the technic. This case is not included in those reported.

#### PREPARATION OF OIL.

I had recently made for me a 10 cc. ampoule of  $\frac{1}{2}$  per cent solution of carbolic acid in paraffin oil, U. S. P., or hydrocarbon oil; to be heated one-half hour at  $150^{\circ}\text{C}$ —and repeat the same procedure in twenty-four hours.

This has yielded better results than the plain Cheseborough oil of vaselin that has simply been sterilized.

The final procedure of every dressing is a thorough drying of the ear. Pulverized acid boracic is blown into the ear and then use is made of single small pieces of gauze one-half inch square with a small roll of gauze to fit snugly into the outer meatus. As a rule the bandage is left off ten to twelve days following the original operation.

In several of the cases vertigo was complained of for some time. In three instances it has continued after the ear was entirely dry. The only explanation that I can offer is that of a

circumscribed labyrinthitis that has not entirely recovered—there remains a hyperemia of the bony canal, or that the canal is simply covered by epidermis, and is more or less influenced by the atmospheric temperature. However, to offset this latter, I have packed the meatus and it did not seem to have any influence. Another reason that had occurred to me, that of pressure on the stapes of the graft.

The only cases that were excluded from this series of 21 cases, were one of labyrinth suppuration and two in which the dura was so diseased that it would not have been safe to use a skin-graft.

Case 107—hearing not improved. Can offer no explanation. In my history card she is marked lengthened Schwabach.

Case 119—hearing made worse. This case had an acute serous labyrinthitis which subsided; two weeks later had a similar attack.

Case 121-122—hearing made worse. Can offer no other explanation than an impaired cochlea as was shown by the Schwabach test. This patient had a circumscribed labyrinthitis as well. This is also one of the patients who has more or less vertigo and tinnitus. This is disappearing and I believe in a comparatively short time will be entirely gone.

Case 123—Perfect result but I have no way of measuring the hearing.

The eighteen cases show a remarkably rapid recovery; 4 cured in three weeks, 10 cured in four weeks, and 4 cured in six weeks. In the series of 18 cases, the hearing was improved in 14, 11 of them could hear a whisper 15 feet or more, and 7 could hear a whisper 25 feet or more.

In conclusion I make the statement unreservedly that every case of chronic suppuration is dangerous to the individual and should be operated upon, and that all cases will recover if operation is properly performed; that the hearing will be improved in the large majority of cases; that there is no danger associated with the operation provided the labyrinth is intact. This latter statement is based on approximately two hundred mastoid operations.

Case.	Age.	Sex.	Discharge.	Operative Findings.	Hearing Before and After Operation.		Duration of after treatment
					Before.	After.	
104	26	Female.	Childhood.	Cholesteatoma.	Whisper, 6 inches.	Whisper, 6 feet.	6 weeks.
105	14	Male.	2 years.	Cholesteatoma.	Speech, water 6 feet.	Speech, water 15 feet.	4 weeks.
107	28	Male.	Childhood.	Cholesteatoma.	Whisper, 3 feet.	Whisper, 3 feet.	6 weeks.*
108	19	Female.	Childhood.	Cholesteatoma.	Whisper, water 12 feet.	Whisper, water 26 feet.	4 weeks.
109	10	Male.	Childhood.	Cholesteatoma.	Whisper, 1 foot.	Whisper, 26 feet.	4 weeks.
110	14	Male.	Childhood.	Cholesteatoma.	Whisper, 1 foot.	Whisper, 25 feet.	4 weeks.
111	25	Male.	2 years.	Cholesteatoma.	Whisper, paper, 3 inches.	Whisper, 6 feet.	6 weeks.
113	33	Female.	Childhood.	Cholesteatoma.	Whisper, paper 3 feet.	Whisper, paper 20 feet.	3 weeks.
115	26	Male.	1 year.	Cholesteatoma.	Whisper, paper, 15 feet.	Whisper, paper 26 feet.	4 weeks.
117	16	Male.	Childhood.	Caries.	Whisper, paper 1 foot.	Whisper, paper 6 feet.	4 weeks.
118	12	Male.	5 years.	Caries.	Speech, 3 feet.	Whisper, chair 25 feet.	3 weeks.*
119	16	Male.	2 years.	Caries.	Whisper, 25 feet.	Whisper, 3 feet.	4 weeks.
120	9	Male.	7 years.	Cholesteatoma.	Whisper, 1 foot.	Whisper, 6 feet.	3 weeks.
121	29	Female.	Childhood.	Caries.	Whisper, 6 inches.	Speech, 1 foot.	3 weeks.*
122	29	Female.	Childhood.	Caries.	Whisper, 3 feet.	Speech, 3 feet.	4 weeks.*
123	4	Female.	3½ years.	Cholesteatoma.	Whisper, chair 2 feet.	Good.	4 weeks.*
124	30	Male.	Childhood.	Cholesteatoma.	Whisper, chair 2 feet.	Whisper, chair 15 feet.	5 weeks.
125	18	Female.	10 years.	Cholesteatoma.	Speech, 2 feet.	Whisper, 25 feet.	4 weeks.

\*The duration of the after treatment dates from the day of the radical mastoid operation and not from the day of the graft which was four days later.

CASE 104.—26 years, female. Discharge from ear since childhood. Complains of occasional vertigo and tinnitus.

*Examination.*—No pain on superficial or deep pressure. Offensive discharge. Anteriorly and above part of the attic wall is destroyed. Below, granulations and a whitish mass. Weber to bad ear. Schwabach, short. Whisper 6 inches. Spontaneous nystagmus, negative. Caloric test positive. Hearing tube whisper, positive.

*Operative Findings.*—Attic, antrum and mastoid cells filled with cholesteatoma and pus. Sinus uncovered. Skin-graft as usual. Recovery, forty-two days. Whisper 6 feet, improved.

CASE 105.—Jos. C., 14 years. Two years ago had an acute otitis media following scarlet fever; the ear has continued to discharge ever since. For the last year has had more or less pain in the ear, occasional pain in mastoid region. Complains of vertigo and tinnitus at times.

*Examination.*—Extreme tenderness over tip of mastoid, membrane entirely destroyed, a bony fistula just over and in front of the short process. A fetid discharge. Weber to bad ear. Schwabach, lengthened. Rinne, negative. Speech, "water," 6 feet. Spontaneous nystagmus, negative. Caloric test positive, exaggerated. Hearing tube, positive. Fistula symptoms, negative.

*Operative Findings.*—Large cholesteatoma, his attacks of dizziness increased by treatment, due probably to the fact that the cholesteatoma absorbed more water and thereby produced pressure on the horizontal canal. The canal stood out quite prominently. In my effort to remove all the carious bone, I produced a fistula. This did not seem to have any effect whatsoever, as he did not complain of dizziness after the operation. On the fourth day, graft. Has made an uninterrupted recovery. Conversation, "water," 15 feet. Twenty-eight days complete healing.

CASE 107.—Female, 28 years. Alcoholic and drug fiend. Discharge from ear since childhood. Headache over this side of the head. No dizziness.

*Examination.*—Right ear, large polypus almost filling meatus, offensive discharge. Whisper, 3 feet. Weber to bad ear. Rinne, negative. Spontaneous nystagmus, nega-



tive. Caloric test, positive. Hearing tube, positive. Cholesteatoma. Whisper, 3 feet. Six weeks complete epidermization.

CASE 108.—Female, 23 years. Married, three children. Discharge from both ears since childhood. Two years ago, had report in right ear, was so ill following that was compelled to go to bed. Dizziness and vomiting. Since then does not hear from this ear. Discharge stopped. For some months past has been having dizzy spells and vomiting following pain on left side of head.

*Examination.*—On pressure pain on whole side of head, especially over tip. Foul, offensive discharge. Weber to this ear. Schwabach, normal. Rinne, negative. Spontaneous nystagmus, negative. Caloric test, positive. Hypersensitive. Vertigo and tinnitus present. Hearing tube, positive. Fistula symptom, negative. Hearing, whisper, "water," 12 feet.

*Operative Findings.*—Cholesteatoma, horizontal canal projecting well into the cavity. During the time of healing and some time since patient has complained of dizziness—with lessened severity and at present some months after operation has it occasionally. The only explanation that I can offer is that the horizontal canal is covered only by graft, thereby exposed to the air, or from pressure of graft on stapes. Hearing, "water," 26 feet. Four weeks.

CASE 109.—Male, age 10. Has had discharge from ear since three years of age. Was under continuous treatment until one year ago. Since then the ear has been syringed by mother once daily. Complains of pain back of ear, pain over whole side of head, acute exacerbation.

*Examination.*—Whole side of head painful to touch. Mastoid exquisitely sensitive. Temperature, 100. Foul, offensive discharge. Bulging posterior wall. Weber to this ear. Rinne, negative. Schwabach, normal. Vertigo present. Occasional tinnitus. Spontaneous nystagmus, negative. Caloric test, positive. Nystagmus after turning, 40"-40". Hearing tube, whisper, positive. Hearing before operation, 1 foot.

*Operative Findings.*—Cholesteatoma, dura and sinus uncovered by caries. Grafts four days later. Made good recovery. Hearing at 25 feet. Four weeks duration of treatment.

CASE 110.—Age 14. For past year has had discharge from left ear, has been under treatment all the time. During the

last year has had dizzy spells with increasing frequency. Has had pain back of ear several times during last year. Complains of frontal headache.

*Examination.*—Painful on deep pressure over the mastoid. Foul, offensive discharge, masses of debris, probably cholesteatoma. Treated by intratympanic irrigation. Two weeks later returned with an acute exacerbation of the chronic supuration, increasing dizziness. Weber, bad ear. Rinne, negative. Schwabach, about normal. Vertigo and tinnitus present. Spontaneous nystagmus, negative. Caloric nystagmus, positive, hypersensitive. Nystagmus after turning 35°-36°. Hearing tube, positive for whisper. Hearing, 1 foot.

*Findings.*—Cholesteatoma, attic, antrum and mastoid cells. Horizontal canal prominent from destruction of bone. In removing carious bone from horizontal canal a fistula was produced. Spontaneous nystagmus to the opposite side for a few days, no other symptoms. Graft four days after operation. Uninterrupted recovery. Hearing at 25 feet.

CASE 111.—Male, age 25. Chronic discharges for one year and a half. Complains of pain during the night. Frequent attacks of vertigo. Headache over this side of head.

*Examination.*—No pain on deep pressure or percussion. Foul, offensive discharge. Masses of epidermis. Under treatment dizzy spells increased in frequency. Drum membrane entirely destroyed and whitish masses seen high up. Weber to this ear. Schwabach, lengthened. Whisper, "paper," 3 inches. Hearing tube (7 feet), whisper positive. Caloric test, positive, exaggerated. No spontaneous nystagmus.

*Operative Findings.*—Cholesteatoma and a necrotic mastoid. Horizontal canal stood out quite prominently. I explain the increasing vertigo by the fact that the cholesteatoma absorbed some of the water, making more pressure on the horizontal canal. Whisper, 6 feet, 40 days.

CASE 113.—Female, age 33. Discharge from ear since childhood. Headache on same side of head, back and front. No dizziness. Had an acute exacerbation 3 or 4 months ago. Never treated before.

*Examination.*—Mastoid sensitive on deep pressure. Membrane destroyed, masses of cholesteatoma protruding from above. Weber to this ear. Rinne, negative. Schwabach,

shortened. Spontaneous nystagmus, negative. Caloric test, positive. Whisper, "paper," 3 feet.

*Operative Findings.*—Attic and antrum filled with a mass of cholesteatoma. Some few mastoid cells carious. Skin-graft, fourth day. In four days, first dressing. Cavity white. Completely healed in three weeks, twenty-one days.

CASE 115.—Male, age 26. Patient gives a history of discharge for one year. Some vertigo. Has been treated for six weeks by intratympanic irrigation.

*Examination.*—No pain on deep pressure or percussion. Foul, offensive discharge. Cholesteatoma. Entire destruction of membrane. Weber in both ears. Schwabach, short. Rinne, positive. No spontaneous nystagmus. Caloric nystagmus, positive. Hearing, whisper, "paper," 15 feet.

*Operative Findings.*—Large cholesteatoma filling antrum and extending into mastoid cells. Skin-graft in four days. Dressed in four days and so continued daily until well, twenty-eight days. Whisper, "paper," 26 feet and more.

CASE 117.—Male, age 16. Discharge from both ears since childhood. Left ear operated three times in New York City. Reoperated by myself. Completely dry. No hearing prior to operation.

*Right Ear Examination.*—Foul, offensive discharge. Masses of epidermis, probably cholesteatoma. Occasional dizzy attacks. Entire destruction of membrane. Whisper, "paper," 1 foot. Weber to discharging ear. Rinne, negative. Schwabach, shortened. No vertigo or tinnitus. Spontaneous nystagmus, negative. Caloric nystagmus, positive. Fistula symptoms, negative.

*Operative Findings.*—Extensive caries of the entire mastoid. Skin-graft in usual way. Recovery in four weeks. Whisper, "paper," 1 foot; after whisper, "paper," 6 feet.

CASE 119.—Male, age 16. Two years ago had pneumonia. Acute mastoiditis requiring operation, during the height of the pneumonia. Made complete recovery. Ear well for several months, would discharge at intervals. In two years' time the discharge disappeared entirely ten or twelve times. Decided a radical operation necessary.

*Examination.*—No pain on superficial or deep pressure.

Heart shaped perforation in inferior quadrant. Weber to this ear. Schwabach, normal. Rinne, positive. Whisper, "water," 25 feet. Caloric test, positive.

*Operative Findings.*—The cavity which had been made by the former operation had been entirely filled with bone which was composed of small and large cells which were infected. The whole tip removed. The cell extended almost to the median line of the posterior wall of the cranium. The right angle incision closed. Second day after operation marked nystagmus to the opposite side; repeated vomiting. Could hear in this ear. Diagnosed serous labyrinthitis.

Skin-graft fourth day. Immediately after this, vertigo, nausea and vomiting disappeared. Was sitting up the following day.

At my first dressing I found all the clamps and stitches taken out. I think the patient did this. The whole cavity was very much infected. Dressed daily. Improving. Twelve days later so dizzy that cannot leave his bed. Vomiting at intervals for two days. Hearing. No temperature. Two days later some dizziness. No vomiting. Nystagmus somewhat lessened. Recovery in four weeks. Whisper, "glass," 3 feet. Wound back of ear closed August 1st. No more dizziness. Nystagmus almost gone.

CASE 120.—Male, age 9. Has had discharge from ear for last seven years. Has had repeated acute exacerbations, present one began three days ago. No discharge at present. Complaints of vertigo and tinnitus.

*Examination.*—Left side of head painful to pressure. Superficial temperature of this side increased in comparison with other side. So much bulging of the posterior superior canal that it almost fills the meatus. Temperature 102.2°. Weber to this ear. Schwabach, normal. Rinne, negative. Whisper, "paper," 1 foot. Caloric, positive.

*Operative Findings.*—Cholesteatoma. Dura uncovered by caries. Sinus uncovered by caries. Recovery in three weeks. Whisper, "paper," 6 feet.

CASE 121-122.—Female, age 29. Offensive discharge from both ears since childhood. One year ago right ear stopped discharging. Complaints of dizzy spells.

*Examination.*—Right ear, not sensitive to pressure or per-

cussion. Masses of epidermis. Foul smelling cholesteatoma. Membrane entirely destroyed. Weber to both ears. Schwabach, somewhat shortened. R. E., whisper, "water," 6 inches. Spontaneous nystagmus to the opposite side. More pronounced to the right side. Caloric reaction positive. Fistula symptoms negative. Operation in usual way.

*Findings.*—Caries of mastoid cells and antrum. Foul pus. Dura uncovered by chisel. Fourth day, skin-graft. Complained of some pain. Dressed third day, one bleeding followed. Some pain following day. Changed dressing, removed two cotton balls. Entire graft in place, cavity white, bleeding from under side of outside flap.

Left ear, no pain on deep pressure or percussion. Foul, offensive discharge. Masses of epidermis simulating cholesteatoma. Membrane entirely destroyed. Weber in both ears. Whisper, "paper," 3 feet. Schwabach somewhat shortened. Rinne, negative. Spontaneous nystagmus to both sides. More pronounced to opposite side. Caloric reaction positive. Very marked with small amount of water. Fistula symptoms negative. Operation usual way.

*Findings.*—Caries of mastoid cells and antrum full of pus. Sinus uncovered by chisel. The horizontal canal was quite prominent. The cancellous bone had been destroyed by caries. Fourth day, skin-graft. Dressed third day. Some bleeding from outer flap. Dressed following day because of pain in other ear and some dizziness. Cavity absolutely white. Right ear, speech, "water," 1 foot. Recovery in three weeks. Left ear, speech, "coffee," 3 feet. Recovery in four weeks. More or less vertigo, some tinnitus in left ear. The vertigo is disappearing gradually.

CASE 123.—Female, age 4. Discharge from ear three and one-half years. Has had severe pain back of the ear repeatedly. About three weeks ago began to have pain back of ear. One week ago began to swell back of ear.

*Examination.*—Large swelling back of ear, fluctuates. Increased surface temperature. Exquisitely sensitive. Offensive discharge. Heart shaped perforation low down. Could not make fork examination. Patient hears in this ear. Caloric reaction, positive.

*Operative Findings.*—Destruction of the greater part of the posterior osseous wall. Cholesteatoma filling up the attic

and antrum which were quite large. Graft and after-treatment carried on in usual way. Cured in four weeks. Good result. Must be good hearing from appearances.

CASE 124.—Male, age 30. Discharge from ear since infancy until five or six years ago when the discharge stopped entirely. Three or four days ago began to have pain back of the ear and over this whole side of the head. Complains of vertigo and tinnitus.

*Examination.*—Very sensitive over mastoids. Whole side of head sensitive. Ear perfectly dry. Entire destruction of membrane. No bulging of posterior wall. Weber to this ear. Rinne, negative. Schwabach, about normal. Whisper, "chair," 2 feet. No spontaneous nystagmus. Caloric reaction, positive. Fistula symptoms, negative. Hearing tube (7 feet), whisper, positive.

*Operative Findings.*—Large cholesteatoma with pus under considerable pressure. Dura uncovered in temporal region by caries, was considerably discolored. Was a question if this particular case was safe for graft. Grafted fourth day. Whisper, "chair," 15 feet. Thirty-three days.

CASE 125.—Female, age 18. Hip-joint disease some four years ago, left with deformity. Discharge from ear for last ten years. Never has had pain in ear or back of ear. Headache on this side of head and attacks of vertigo.

*Examination.*—Not painful on deep pressure in mastoid region. Offensive discharge, entire destruction of membrane. Hearing, speech, 2 feet. Weber to bad ear. Rinne, negative. Schwabach, shortened. Spontaneous nystagmus, negative. Caloric nystagmus, positive. Fistula symptoms, negative.

*Operative Findings.*—Sclerosed mastoid, chloesteatoma. Horizontal canal stood out from surrounding bone. Skin-graft on fourth day in usual manner. Ear dry in four weeks. Hearing, whisper, twenty-five feet.

In discussion Dr. Horn reported seven cases of skin-graft by my method with approximately the same results as to time in healing and to the improvement in hearing.