CLINICAL RECORD

STAPES MOBILIZATION

By HAZLEY ANDERSON (Birmingham)

THE cases included in this paper are of two kinds. Firstly a few cases of deafness due to ossicular adhesions. Secondly a small series of cases of otosclerosis.

In justification of the smallness of the number of cases I would mention the comparative rareness of adhesive deafness as compared to otosclerosis.

Mobilization of the stapes for otosclerosis is a procedure which is at the moment very much on trial; I think, therefore, that the results of even a small number of cases may be of interest and value.

My attention was first directed towards the possibility of dividing adhesions in the middle ear by Reading in 1952. The route of access to the middle ear that I used for dividing adhesions I also used in cases of otosclerosis after reading Rosen's paper on the subject.

Operative Details

The approach is an endaural transmeatal one.

The first incision is a circumferential one; on the right side it would be from *two o'clock backwards to eight o'clock. It is situated within the meatus just* superficial to the bony meatus.

The second incision is a short vertical one in front of the ear joining the first at right angles. Both incisions are down to bone.

Elevation of the soft tissues of the meatus is now commenced. The meatal spine is removed, and the elevation is continued down to the tympanic ring. It is important that the elevation should include a small area behind the posterior meatal ridge otherwise a tear may develop at this point near the drum. I find the use of small pledgets of cotton wool, used as dissectors, a great help in the elevation.

The middle ear is entered at the notch of Rivinius. The drum and attached meatus are now gently retracted laterally.

In cases of adhesions, where the whole of the ossicular chain needs to be exposed, the bulk of the outer attic wall is now removed.

In cases of otosclerosis the removal of bone is limited to a small area of the posterior attic wall and the area in the region of the chorda tympani, which is retracted laterally with the drum.

There is an ample exposure for any necessary manipulations in the middle ear and there is no difficulty in using the operating microscope, which is used from this stage onwards. Subsequent procedure, in cases of adhesions varies from case to case and will be described separately with each case.

In cases of otosclerosis a small dental pick is used to apply gentle pressure to

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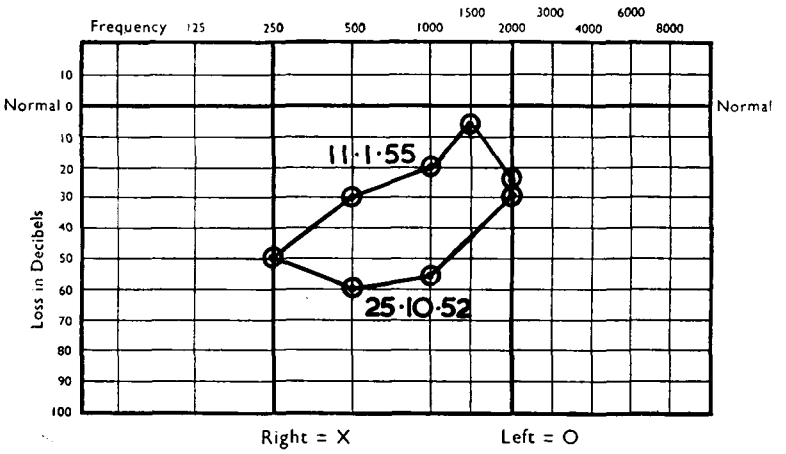
the neck of the stapes in line with the stapedius tendon, which can be clearly seen.

In successful cases the stapes can be seen and felt to move, and movement can be transmitted to it through the incus. An advantage of this route is that if the stapes cannot be mobilized the fenestration can be proceeded with straight away. The meatal soft tissues are gently packed back into position with pledgets of wool impregnated with B.I.P. The incisions are closed with a few fine stitches.

Ossicular Adhesions

CASE I. A.C. AGE 13

This patient was first seen in *1952*, at the age of 13, with a history of gradually increasing deafness for several years. There was no history of any aural discharge or otalgia. There was no paracusis.



AUDIOGRAM I

Her tonsils and adenoids had been removed at the age of 3. On examination, both drum heads were intact, but very retracted and almost immobile. She had a severe conductive deafness present with good bone conduction (Audiogram I).

Her nose and nasopharynx were healthy. Both eustachian tubes were patent, and inflation made no difference to her hearing level.

X-rays showed relatively acellular mastoids.

To complicate matters her mother had undoubted otosclerosis. I considered however, that the deafness was probably due to adhesions, and decided to explore the middle ear with the possibility of proceeding to a fenestration.

At operation in *November, 1952*, the ossicular chain was found to be intact, but completely rigid, there being no apparent movement at any of the joints.

The incus and head of the malleus were removed; after this had been done, slight mobility returned to the stapes. After division of some rather tenuous adhesions around the stapes, the stapes became fully mobile.

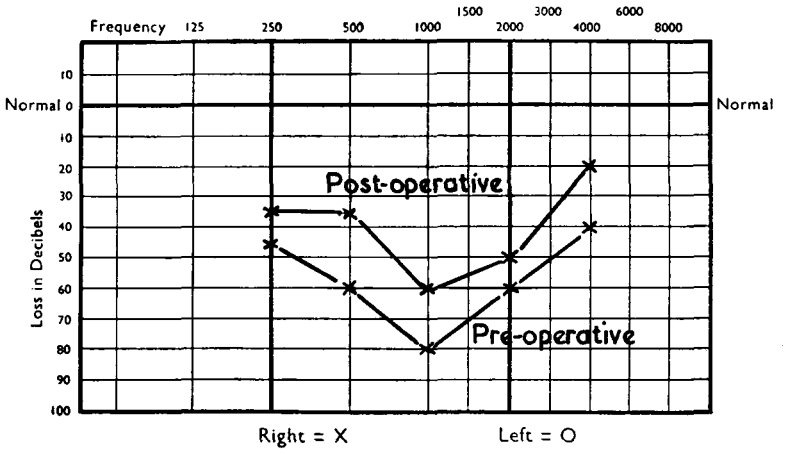
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On looking back I am not sure whether this was due to division of the adhesions or to my manipulations in feeling for mobility of the stapes.

There was a useful post-operative improvement in the hearing which has been maintained. The audiogram shown was done a little over two years after operation and there has been no deterioration since.*

CASE II. A.B., AGED 15

This patient gave a history of bilateral discharging ears as a child and of having had a radical mastoid operation on the left ear.



AUDIOGRAM 2

On examination, she had a modified radical mastoid cavity on the left side. The right drum head was scarred, retracted and immobile, but intact. The eustachian tube was patent.

She had a severe conductive deafness present in both ears. She herself considered that her left ear was the better of the two. (Audiogram 2). I decided to explore the right middle ear.

At operation in *June, 1953*, there was found to be considerable disorganization of the ossicular chain and extensive and rather soft and vascular adhesions around the stapes.

The remains of the incus and the head of the malleus were removed and the adhesions were divided, after which the stapes appeared mobile.

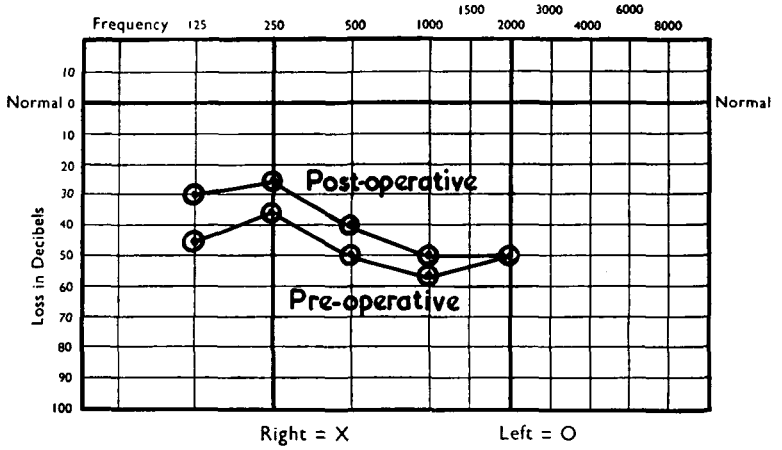
There was a useful post-operative improvement in the hearing. This was maintained for three months only and then fell rapidly to the pre-operative level.

CASE III. K.J., AGED 48

This patient gave a history of 25 years of deafness. Her drum heads were both intact, but very retracted and immobile. The eustachian tubes were both patent. She had a severe conductive deafness (Audiogram 3).

* This case was shown at the clinical meeting of the Midland Institute of Otology, January, 1955.

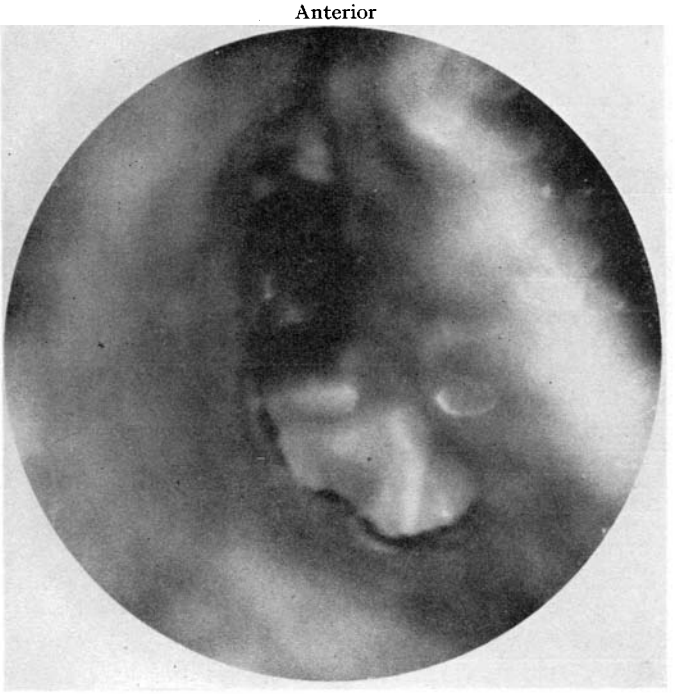
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AUDIOGRAM 3

At operation there was found to be a defect in the ossicular chain, the distal portion of the long process of the incus was missing. The stapes was also partially fixed by adhesions.

Anterior



Posterior

CASE. III. View down the operating microscope showing gap in the ossicular chain.

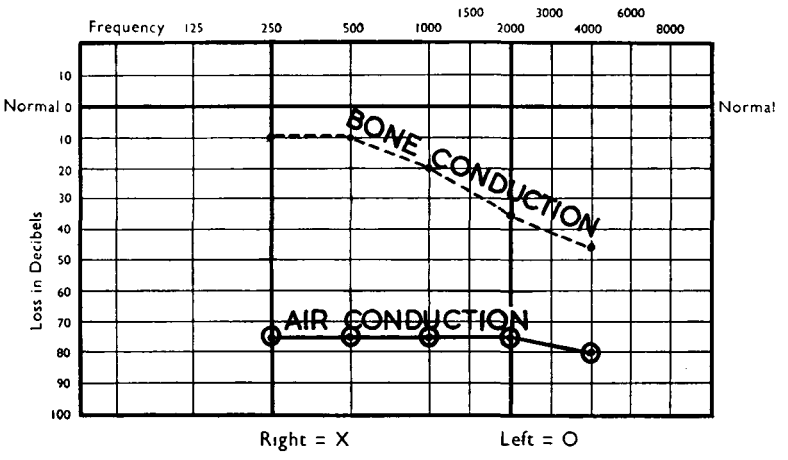
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The incus and head of the malleus were removed and the stapes mobilized. There was a slight post-operative improvement only.

CASE IV. L.M.K., AGED 44

This patient gave a history of 14 years of severe deafness. Both her drum heads were intact, but very scarred, retracted and immobile. The eustachian tubes were both patent. The nose and nasopharynx were healthy.

She had a severe conductive deafness (Audiogram 4). At operation, the ossi-



AUDIOGRAM 4

cular chain was found to be intact. There were two long thin adhesions stretching from the long process of the incus to the facial canal. The footplate of the stapes was firmly fixed by two thick and fleshy adhesions. These adhesions were fan shaped with the narrower ends attached to the footplate.

These adhesions were divided without disturbing the ossicular chain. The stapes and the whole ossicular chain then appeared fully mobile.

There was a slight post-operative improvement in the hearing, but it was not sufficient to be of any practical value.

Discussion

Results in this group have been disappointing, as would also seem to be the experience of others (Tumarkin, 1954).

It is to be hoped that the work of Zöllner and others will lead to an advance in the treatment of this type of case.

All these cases had intact drum heads; in none of them were seen the tympanosclerotic changes described by Zöllner.

Case I, the only one with a lasting result (now three years), showed relatively small adhesions. In view of the family history I wonder if there were not also some otosclerotic changes present, though none were visible with the operating microscope.

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In Case II, from the appearance of the adhesions and from the loss in three months of the initial gain in hearing, I think it is likely that the adhesions were still in an "active state" and reformed.

In Case III the defect in the long process of the incus was rather unexpected. The photograph, taken down the operating microscope, though not very clear, shows the long process of the incus, the stapes and the stapedius tendon. It also gives some idea of the exposure.

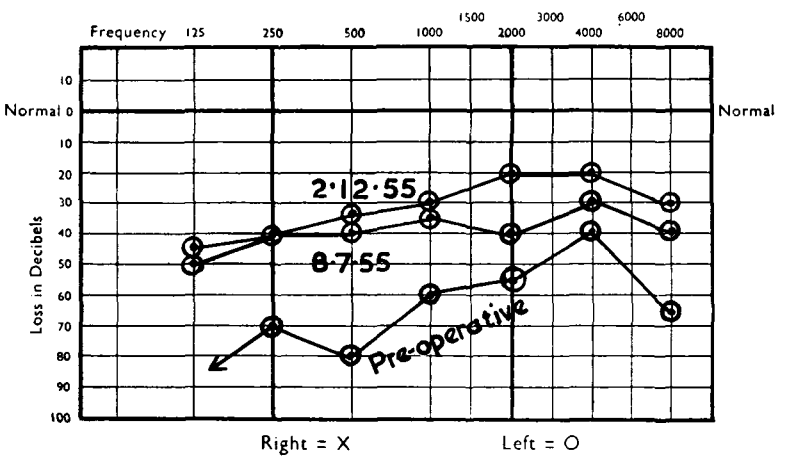
In Case IV I had expected at least a temporary improvement. The audiogram showed a wide gap between the air and bone conduction; and I felt certain that the stapes and ossicular chain were fully mobile at the end of the operation. There was but a slight improvement in the hearing.

I think that the explanation must be that the round window also was closed by adhesions.

Otosclerotic Cases

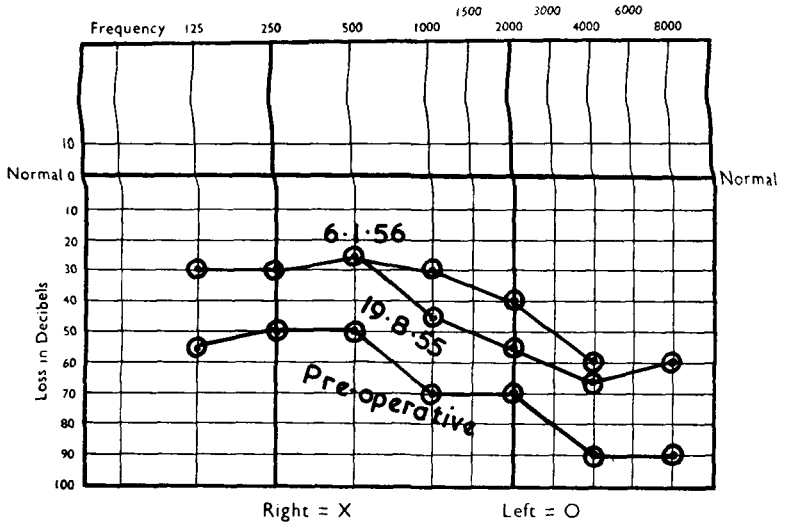
The results of nine cases are summarized in the table below. Audiograms for some of them are also shown.

Case	*Date of Operation*	*Improvement*	*Duration*
(1)	J.S., *January, 1955*	Slight only	Fenestrated
(2)	E.G., *May, 1955*	Moderate	3 months only
(3)	A.G., *June, 1955*	Good	To present date
(4)	C.R., *July, 1955*	Good	To present date
(5)	P.M., *September, 1955*	Moderate	2 weeks only
(6)	P.K., *December, 1955*	Moderate	To present date
(7)	D.C., *December, 1955*	Moderate	2 months only
(8)	F.C., *January, 1956*	None	—
(9)	D.W., *March, 1956*	Excellent	To present date

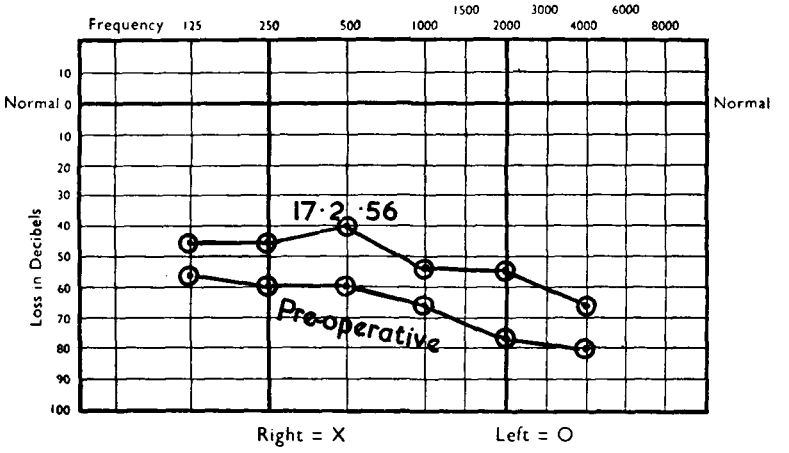


Case III, A.G.

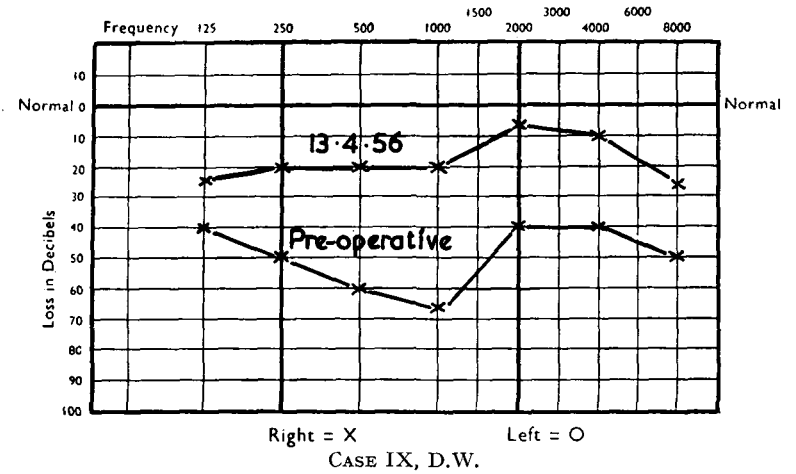
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Case IV, C.R.



Case VI, P.K.



Case IX, D.W.

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Discussion

Three cases in this series show a result comparable to, or better, than that which could be expected from a fenestration. These cases all show a narrowing of the air bone gap, and in part of the scale an inversion of it.

Whether these results will last or not remains to be seen, as the first successful case has so far only been followed up for 11 months.

It is interesting to note that in cases (3) and (4) there was a further slight improvement over a period of several months. It is also of note that those cases with a good result are also the cases which show signs of lasting.

In no case in the series was there any deterioration in the hearing below the pre-operative level.

Rosen classifies his cases into four groups according to the pre-operative bone conduction level. In this series only one case had a bone conduction loss of less than 20 decibels, the rest would come into his category C. and D. The audiograms were carried out for me in a completely sound proof room.

The advantages of this procedure over a fenestration are the potentially greater gain in hearing, the absence of a cavity and the shorter hospital stay.

The disadvantages at present are the smaller number of successes and the, as yet, not completely proven lasting quality of the results.

The former will I think improve. My views on what constitutes a fully mobile stapes have altered somewhat; and I feel that the stapes was not mobilized as fully as it might have been in one or two cases in this series.

Summary

Four cases of deafness due to ossicular adhesions are described and brief operative details and the results given. The results in nine cases of mobilization of the stapes for otosclerosis are reviewed and operative details given.

Acknowledgments

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