Stapedectomy

A non-personal series

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During the period 1963 to 1972 stapedectomy, either with polythene strut or piston replacement, was carried out at St. Thomas' Hospital, London on National Health Service patients by consultants, senior registrars and registrars. Unlike most stapedectomy reviews, therefore, this is not a personal series with one standardized operative technique. It is hoped, however, to give an impression of the type of disease seen and the results to be expected within such a general otological unit.

Some patients were not included in this review for reasons of their being lost to follow up or the lack of sufficient detail in their files to enable complete assessment to be made. The series is of 447 patients who initially underwent 558 stapedectomies (second sides being performed within 9 months to 6 years of the first.) The sex incidence was 289 females (51·8%) and 269 males (48·2%).

Investigation

1. Footplate pathology was assessed in four grades of progressive severity recognized macroscopically at the time of surgery.

2. Footplate pathology was also examined in relation to pre- and post-operative incidence of tinnitus and vertigo.

3. Pre-operative air conduction was measured over frequencies of 500, 1000 and 2000 Hz (Shambaugh, 1959) and the average noted.

4. The post-operative air conduction and the average closure of the air-bone gap on the above frequencies was assessed, as was the bone conduction loss at 4000 Hz.

5. Classification of the results of the surgery was performed as follows:

Group A (Success) Closure to within 10 dB of the air-bone gap.

Group B (Partial success) Closure of the air-bone gap but not within 10 dB.

Group C (Failure) No change, or deterioration, in the audiogram findings.

In an attempt to remove bias from the results the post-operative findings were tabulated from the most recent audiogram, and patients without a two-year follow up were rejected. This method of assessment is unlikely to give a false impression of initial results but may miss some late sensorineural failures.

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6. A separate comparison has been made between polythene strut replacement and piston replacement. Within the piston group, over 90% were teflon and the remainder were wire/teflon or stainless steel and no obvious difference was seen within the different piston groups.

7. Revision operations and complications were examined.

Results

TABLE I.

DISTRIBUTION OF FOOTPLATE PATHOLOGY AND RELATIONSHIP TO PRE-OPERATIVE DEAFNESS

Footplate type	Cases	Less than 60 dB pre-op. AC. loss	Greater than 60 dB pre-op. AC. loss
I	191	128	63
II	191	101	90
III	141	69	72
IV	35	8	27

It will be noted that there is a tendency for thicker footplates to be associated with a greater air conductive loss.

TABLE II.

RELATIONSHIP OF FOOTPLATE PATHOLOGY WITH PRE- AND POST-OPERATIVE TINNITUS AND VERTIGO

Footplate type	Pre-op. tinnitus No. cases	Pre-op. vertigo No. cases	Post-op. tinnitus No. cases	Post-op. vertigo No. cases
I	44	4	15	6
II	52	11	18	14
III	63	4	16	8
IV	15	3	8	9
Total % of cases	32	3·9	10·2	6·6

The incidence of pre-operative tinnitus was almost one third of all the cases but surgery decreased this symptom to only 10% of the cases. (These figures are similar to those of Holden *et al.*, 1970). It will be seen by comparison that patients having symptomatic persistent vertigo increased in number post-operatively and only three of the original 22 with pre-operative vertigo actually lost their symptom post-operatively. In 18 cases vertigo developed post-operatively and these were mainly in the more severely involved footplates. It is probable that this distribution of vertigo post-operatively is related to more 'vigorous' footplate manipulation secondary to more severe disease.

If the polythene strut results are removed from Table III the the amended results are: 82·4% success, 13·1% partial success, and 4·5% failures for piston stapedectomy.

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TABLE III.

RESULTS OF STAPEDECTOMY IN TOTAL AND RELATED TO FOOTPLATE PATHOLOGY

Footplate type	Group A (Success)	Group B (Partial)	Group C) (Failure)
I	168	18	5
II	155	24	12
III	102	33	6
IV	21	5	9
Total cases %	79·9	14·3	5·8

TABLE IV.

RESULTS OF POLYTHENE STRUT STAPEDECTOMY

Total number	Group A	Group B	Group C
109	76	21	12
%	69·7	19·2	10·1

The above results compare favourably with other series published. (Morrison, 1969; 70% polythene, 88% piston; Ludman, 1968: 92% piston A+B; Holden *et al.*: 1967: 88% polythene, A+B; Dawes and Curry, 1969: 90%.)

The average bone conduction loss post-operatively at 4000 Hz in the 558 ears under assessment was 60 dB. Although insufficient numbers of the cases were assessed with speech audiometry to obtain any conclusions it has been shown that a high frequency loss from 4000 to 8000 Hz does not correlate with a deterioration in the speech score (Merchant, 1967).

TABLE V.

REVISION OPERATIONS

Findings	No. of cases	Improved outcome
Slipped Prostheses	11	5
Incus Erosion	3	1
Adhesion	1	1
Early Dead Ears	5	0
Late Perilymph Leak	3	1
Total	23	8

It will be noted that only one third of the revision operations resulted in any improvement in the hearing adding weight to the knowledge that revision procedures must be reviewed with scepticism as to their outlook.

In addition to the above cases which must be regarded as complications the remainder of complications are seen in Table VI.

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29 cases of the 558 ears operated on developed complications as shown above. This represents an incidence of 5·2%.

TABLE VI.

COMPLICATIONS NOT NECESSITATING STAPES REVISION

Complication	Number
Severe Vertigo	1 (needed Labyrinthectomy)
Taste Distortion	2 (1 following the 2nd side)
Severe Tullio	1
Otitis media	1 (leading to persistent perforation)
Persistent Perforation	2 (including above case)

Discussion

It is unfortunate when deriving any series that cases need to be omitted. It is, however, necessary when assessing the results of an operation such as stapedectomy where post-operative results may alter over months or years. In this review an attempt has been made to give an accurate post-operative assessment of improvement by not assessing any case under two years. By so doing, it is also hoped that most of the late complications will have been included.

Summary

An attempt has been made to indicate from St. Thomas' Hospital what the likely outcome of stapedectomy would be when performed by a cross-section of the speciality at differing levels of training, and to indicate the complications encountered at this centre. Included in the review is a comparison of the results from polythene struct and vein graft replacement and piston replacement.

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