

ORIGINAL ARTICLE

Cause Laser Stapedotomy. Results and Patient Satisfaction Rate Audit in a District General Hospital

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Patients as well as surgeons consider hearing improvement as the main indicator of success in surgery for otosclerosis. However patient's opinion does not always agree with the audiological measurements.

It is important for the ear surgeon to refine a specific technique in an effort to maximize postoperative patient satisfaction. We present a retrospective review of all Cause Laser Stapedotomies performed by the same surgeon in a District General Hospital during a 5-year period (1995-2000). The analysis of our data (56 operations) was based on the guidelines from the Committee on Hearing and Equilibrium of the American Academy of Otolaryngology-Head and Neck Surgery. We also present analysis of the com-

plication rate and improvement in quality of life postoperatively using the Glasgow Benefit Inventory (GBI). The response rate for the GBI questionnaire was 76%, which is high. The postoperative hearing benefit of the patients reviewed in this study were in line with the patient satisfaction rate.

Our results are comparable with those from major centers and show that stapedotomy is a safe procedure in hands of an experienced otologist with great postoperative results and significant improvement in patient's quality of life.

Key words: Cause Laser Stapedomy, Postoperative Patient Satisfaction, Quality of Life, Glasgow Benefit Inventory.

History of stapes surgery is well documented; the number of patients undergoing surgery annually for otosclerosis peaked in 1963, 5 years after the introduction of stapedectomy. At present patients presenting with otosclerosis each year represent mainly the new cases in the population. The consistent improvement in the cosmetic appearance and sound quality of hearing aids in recent years and the recommendation of a hearing aid trial, for selected patients, before deciding on surgery has resulted in more patients accepting conservative management. There is an increasing number of practicing otolaryngologists who have been trained in stapes surgery so that the diminishing pool of patients is now being treated in a large number of centres. It has been suggested that, in order to obtain the best results, such surgery should be concentrated in a small number of specialized centres. We believe that benefit might be gained for the patients from an operation performed by a surgeon with experience in otology working in a district hospital using a specific surgical technique. Our opinion is based on the results of a retrospective review of all Cause Laser Stapes surgery performed at the William Harvey Hospital, Ashford during a 5-year period (1995-2000) and the patient satisfaction rate using the Glasgow Benefit Inventory.

PATIENTS AND METHODS

A retrospective review of all patients who underwent Cause Laser surgery for otosclerosis from January 1995 to December 2000, was conducted. The data recorded included age, sex, unilaterality or bilaterality of disease, side of operated ear, date of operation, operative findings, hearing results and complications. All operations were performed by the same surgeon. Four patients were excluded from the study (three patients who had inadequate audiometric data in their records and one who underwent revision stapedectomy and closure of oval window fistula).

The last performed preoperative audiogram was defined as the preoperative audiogram. The postoperative audiogram was the one showing the best hearing within 1 year of surgery; this was selected for the purpose of comparing like with like although it holds no predictive value for future hearing thresholds. There is no universal agreement regarding the best way to summarize the pure-tone audiogram as a single number. Evaluation of our data was performed using the guidelines issued by the Committee on Hearing and Equilibrium of the American Academy of Otolaryngology-Head and Neck Surgery.¹ Preoperative and postoperative air and bone conduction

pure tone thresholds at 500 Hz, 1, 2 and 3 kHz (in operated and not operated ear) were calculated. It is not routine to test hearing at 3 kHz in all centres. In our data thresholds at 3kHz were not available, so we estimated the threshold at 3 kHz as the mean threshold at 2 and 4 kHz. In case of group data analysis in large series, it is unlikely that the difference between the three- and the four-tone averages would significantly alter the results. The Committee believes that it is appropriate to include 3 kHz to reflect the importance of higher frequencies in the understanding of speech, which is the goal of hearing reconstruction. Our analysis included the Committee's recommendations for reporting results in stapes surgery which are:

1. the postoperative air-bone gap in decibels
2. the decibels of closure of the air bone gap
3. the change in high-tone bone conduction levels, in decibels of hearing loss for each case.

For convenience we report summaries of the air-bone gap in bins. The Committee recommends that when bins are used, they should be constructed as follows: grade A: 0-10 dB, grade B: 11-20 dB, grade C: 21-30 dB and grade D>30 dB.

Operative and postoperative complications were studied (as recorded in the operative records and the case notes respectively); An ear with no hearing in the first post-operative audiogram was defined as an immediate dead ear.

The overall success of any intervention (medical or surgical) cannot be estimated solely from measurements of technical success. Changes in the patient quality of life resulting from the intervention must also be considered². We completed our study using the Glasgow Benefit Inventory (GBI) which is a post-intervention questionnaire and assesses the intervention's effects on the health status of the patients. The GBI is a measure of patient benefit developed especially for ENT interventions, contains 18 questions and the response to each question is based on a five-point Likert scale. The questionnaire has a total score and 3 subscales : a general subscale (12 questions), a social support subscale (3 questions) and a physical health subscale (3 questions). All these scores range from -100 to +100. All patients received an anonymous GBI questionnaire in their address with a cover letter explaining the purpose of the study and specifying in detail how to fill in the questionnaire.

RESULTS

A total of 56 ear cases who underwent Causse Laser stapedotomy were studied (in 7 patients both ears were operated upon). The mean age was 50 years with a 3:1 female to male ratio. Twenty nine right and twenty seven left ears were operated upon. The surgical procedure was, in all patients, Causse Laser sta-

pedotomy, the prosthesis material was teflon and vein graft was used to seal the oval window.

The results regarding the postoperative air-bone gap (in decibels) were:

- 0-10 dB in 75,5% of operated ears (grade A)
- 11-20 dB in 15,1% of operated ears (grade B)
- 21-30 dB in 5,7% of operated ears (grade C)
- >30 dB in 3,7% of operated ears (grade D)

A postoperative air-bone gap up to 20dB was successfully obtained in 90,6% of operated ears. The results are comparable with those reported in large series of other centres.

The result depicted in decibels of air-bone gap closure were:

- <0 dB in 5% of operated ears
- 0-10 dB in 27,6% of operated ears
- 10-20 dB in 42,3% of operated ears
- 20-30 dB in 15,4% of operated ears
- >30 dB in 9,6% of operated ears

The mean difference (improvement) between the pre- and postoperative PTAs was 6.5dB. Postoperative bone - conduction PTA was within -5 and +5dB of the preoperative level in 42% of subjects. Six per cent of the remainder had an increase in sensorineural hearing level of <5 dB, whereas 52% had improvement in thresholds of >5dB. In fact, 38% of cases had an improvement in bone-conduction thresholds of >10dB, with a maximum improvement in one case of 43dB.

Intraoperative problems occurred in 17 operations. Graft problems occurred in 7 operations (all patients had grade A or B post-op results). Four ears presented obliterative otosclerosis (3 patients had grade A or B post-op results, but one patient had grade D). In 5 operations there was difficulty to fit the prosthesis (4 ears with grade A or B post-op results and one ear with grade D). One operated ear presented erosion of the incus and slipping of the prosthesis (grade C post-op results).

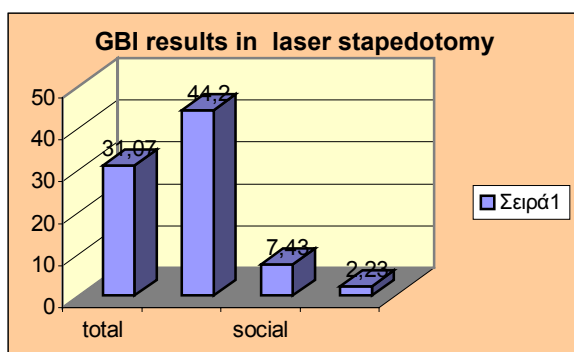
Immediate dead ear occurred in 1 patient, after a postoperative infection. Immediate postoperative facial nerve palsy (grade 2) occurred in one patient who fully recovered within 3 weeks. Nine patients had mild postoperative vertigo for up to one week. Only one patient had severe vertigo (dead ear). Postoperative infections (otitis externa or media) were recorded in 4 patients. Haemotympanum was found in 11 patients, metallic taste in 2 patients and 1 patient had postoperative perforation of the tympanic membrane.

This study uses the Glasgow Benefit Inventory to quantify the changes in quality of life. The response rate was 76%, which is considered high. The total benefit was found to be +31.07 (95% confidence interval [CI], +22-+40). The three components of GBI were analyzed separately, and it was found that general benefit was maximum at a value of +44,2

(CI,+35-+53) followed by social benefit at a value of +7.43(CI,0-+14) and physical benefit at a value of +2.23(CI,-7-+9).(Figure 1)

FIGURE 1

Glasgow Benefit Inventory results in Cause Laser stapedotomy.



DISCUSSION

One of the objectives of this retrospective study was to record and analyze the results of the specific stapes surgery technique used in a District Hospital, and compare them with results from major otologic centers.³ The results of major series of surgery for otosclerosis have reported an 85% chance of obtaining a good hearing improvement, 10% slight improvement, a 5% risk of some sensorineural hearing loss and a 2% risk of total sensorineural loss, that is, a dead ear. The analysis of our data showed that our results are comparable to those reported in large series, with good hearing result in 90.6% of operated ears and air-bone gap closure within 0-10dB (Grade A) in 75.5%. However the definition of success greatly influences the percentage of successful results. Authors who define success by size of air-bone gap can claim a higher percentage of success (class A results) than those who define success as normal air conduction hearing. One should be mindful of this fact when critically reading the outcomes in the literature.⁴

In our study we found that the annual number of stapes operations is variable but shows no decreasing trend. From our retrospective observations, we conclude that stapes surgery is a safe procedure in the hands of a surgeon with experience in otology. However the number of stapes operations suitable for training in a district hospital seems to be limited due to small numbers of straightforward cases.⁵ The variations of anatomical and surgical findings raise the need for a surgeon who will be capable to modify easily his technique and obtain a good result.

The incidence of early complications (immediate

dead ear, chronic tympanic membrane perforation, partial or complete facial palsies, perilymph fistulae and labyrinthitis) varies in other series from 2% to 17%.⁶ The early complication rate in this study was 5.3%. Vertigo in the first post-operative week, indicates poor prognosis for hearing improvement. This study also showed that fear of fistula, after stapedotomy is unjustified. Since stapedotomy gives the patient the most satisfying long term results and is still the safest technique with low incidence of serious complications like fistula and sensorineural loss, we recommend stapedotomy as the treatment of choice for otosclerosis.⁷

Outcome research is a new concept in clinical medicine and has been described as a "technology of patient experience." Health care administrators and clinicians do increasingly recognize the importance of outcome research and its impact on patient management and various policy decisions. These involve a broad spectrum of health care issues including health-related quality of life, so outcome research reinforces the fact that the patient plays the central role in modern clinical practice. In addition to traditional clinical assessments, outcome research measures functional capacity, psychosocial well-being, and symptomatic relief, which are of utmost importance to the patients.⁸ It is important to assess quality of life in patients who undergo stapes surgery because this may be helpful in making policy decisions regarding the group of patients who should have priority, the appropriate technique etc. We have received completed questionnaires from 34 of 49 patients (76%). This high response rate validates the results by avoiding bias that can occur with lower response rates. The analysis of the total mean benefit as measured by the GBI shows that the majority of patients had significant improvement in quality of life. The three domains of GBI were analyzed separately. The results indicate that the general benefit was maximum, followed by social and physical benefits. This pattern is similar to the results of other otological procedures with good outcome in several studies. The difference between the audiometric results and the GBI scores can be explained by the various expectations of the patients about their operation, and the correlation of postoperative symptoms (vertigo, tinnitus etc) with their subjective opinion of the surgical outcome. Patients as well as surgeons consider hearing improvement as the main indicator of success in surgery for otosclerosis. However postoperative symptoms and complaints can be expected in a certain percentage of patients. Because these can influence the general outcome of surgery, the ear surgeon should try to painstakingly refine his technique in an effort to minimize their sources. In addition detailed discussion in pre-operative patient counseling is very significant. We

also must consider the fact that when surgery resulted in little improvement in hearing, patients reported benefit close to zero, and this can significantly influence the GBI results.

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