SURGICAL MANAGEMENT OF OTOSCLEROSIS- STEPEDECTOMY VERSUS STAPEDOTOMY

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ABSTRACT

Objectives: To compare post operative morbidity after stapedotomy with stapedectomy.

Study Design: Quasi-experimental study.

Place and Duration of Study: ENT Departments of CMH Rawalpindi and CMH Lahore from Jan 2006 to Jan 2009.

Patients and Methods: Forty eight patients were included in this study and were divided into two groups; 14 patients underwent stapedectomy and 34 patients underwent stapedotomy.

Results: Severity and duration of vertigo and hospital stay with stapedotomy were less as compared to stapedectomy.

Conclusions: These results demonstrated that postoperative morbidity with stapedotomy was less as compared to stapedectomy.

Keywords: stapedotomy, stapedectomy, vertigo

INTRODUCTION

Otosclerosis is a disease of the bony labyrinthine capsule, which consists of one, or more otospongiotic foci instead of the less vascularized normal enchondral bone. Otosclerosis affects approximately 3 percent of the population[1]. Females are affected twice as compared to males. The only effective treatment for otosclerosis is removal of stapes with restoration of the conduction mechanism. Medical treatment in terms of sodium fluoride has no established curative role[1-4]. Surgical treatment of otosclerosis revolves around stapedectomy and stapedotomy. With stapedectomy being a radical procedure with increased exposure of labyrinth to pressure effects and hence greater labyrinthine symptoms post operatively. Stapedotomy decreases the exposure of the labyrinth to external environment[5-8,13].

Newer techniques of otosclerosis surgery include performing stapedotomy with laser and using a Teflon piston as in conventional stapedectomy. Stapedotomy is a better procedure as compared to stapedectomy due to less severity and duration of vertigo and therefore less hospital stay post operatively[9-12].

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MATERIAL AND METHODS

The study was carried out in Departments of ENT CMH Rawalpindi and CMH Lahore. It comprised of 48 patients in three years time. There were 17 males and 31 females. Patients included were aged between 21 to 39 years. Patients with history of infective middle ear disease and head injury were excluded.

Informed consent was obtained from all patients after explaining advantages and expected complications of both the procedures. Patients were divided into two groups. Patients in Group A underwent stapedotomy in which a small fenestra was made in foot-plate of stapes using micro drill. A Teflon piston prosthesis (4.5 mm long 0.8 mm shaft with loops) was placed between fenestra and long process of incus. Patients in Group B underwent stapedectomy in which two third of stapes footplate was removed and prosthesis placed with interposition of Teflon piston as in stapedotomy. Group A comprised of 34 patients and Group B comprised of 14 patients.

Postoperative morbidity was studied in terms of severity and duration of vertigo and hospital stay. Postoperative vertigo was divided into, short duration (less than 2 days), long duration (more than 2 days). Severity was categorized as mild, moderate and severe. Patients who could perform daily activities without help were categorized as mild; those

who required assistance as moderate and those who were bed bound as severe vertigo. Postoperative hospital stay was studied in days and was divided into short stay (<2 days) and long stay (>2days).

Data analysis: Data had been analyzed using SPSS version 10. Descriptive statistics were used to describe the data. Chi-square test was used to compare severity and duration of hospital stay. P-value <0.05 is considered as significant.

RESULTS

A total of 48 patients were included in this study over a period of 36 months. The patients were divided into two groups A and B. Group A underwent Stapedotomy and Group B underwent stapedectomy. Group A comprised of 11 (32%) males and 23 (68%) females, while group B had 6 (43%) males and 8 (57%) females. The age of patients varied from 21 to 39 years. Mean for age was 27.12 years and Standard Deviation was 5.80. mean age of group A was 27.12 years (SD=5.80) while mean age of patients in group B was 25.67 years (SD=4.92). Both the groups were comparable with respect to age.

Patients in both the groups recovered from anaesthesia without any complications. All patients were kept on postoperative antibiotics and analgesics and discharged between 1st and 5th postoperative day. In all patients the parameters were meticulously recorded.

In terms of severity of vertigo in Group A Mild cases were 24 (71%), moderate 9 (26%) and severe 1 (3%). In Group B Mild cases were 2 (14%), moderate 5 (36%) and severe 7 (50%) (P<0.01). In terms of duration of vertigo in Group A patients with short duration were 31 (91%) and long duration vertigo were 3 (9%). In Group B only 3 (21%) patients had short duration vertigo while 11 (79%) patients had long duration vertigo (lasting for more than 2 days).

In Group A 4 (12%) patient had prolonged hospital stay i.e. discharged between 3rd and 5th postoperative day while 30 (88%) patient had short hospital stay and were discharged within first two postoperative day. In Group B 3 (21%) patients had short postoperative hospital stay. (Discharged on 1st and 2nd postoperative day), while 11 (79%) patients had prolonged hospital stay who were discharged between 3rd and 5th postoperative day (p<0.01).

Table.1 Group Wise Gender Distribution of Patients

	Males	Females	Total
Group A	11	23	34
Group B	6	8	14

Table-2: Chi square Test for Severity of Vertigo.

	Mild	Moderate	Sereve	Total
Group A	24	9	1	34
Group B	2	5	7	14

n=48 **p-value < 0.01**

Table-3: Chi square Test for Duration of Vertigo

	Short duration	Long duration	Total
Group A	29	5	34
Group B	3	11	14

n=48 **p-value<0.01**

Table.4 Chi square Test for Postoperative Hospital stay

Patients	Hospital stay		Total
	Short stay	Long stay	
Group A	31	3	34
Group B	3	11	14

n=14 **p-value <0.01**

DISCUSSION

Otosclerosis is the most common cause of conductive hearing loss in young adults. Although hearing aids are effective alternative to surgery but surgery is the treatment of choice because of its superior functional and cosmetic results.

Any surgical procedure performed on the inner ear exposes the labyrinth to surgical trauma, external environment and pressure changes. Surgery for otosclerosis always creates a perilymph fistula resulting in vertigo. This fistula heals spontaneously by fibrous tissue (reparative granuloma). Stapes surgery is associated with complications like perilymph fistula, postoperative vertigo, tympanic membrane perforation, and prosthesis dislodgement. Although rare but facial nerve palsy and a permanently dead ear may also result as a result of surgical trauma[1].

In our study only one patient (amongst stapedectomy group) ended up with dead ear. John Shea who in 1956 performed 1st successful stapedectomy brought the revolution in stapes surgery. Since then several modifications have been made with newer trends towards less traumatic but equally or more effective procedure like stapedotomy. The size of fistula created is small in stapedotomy as compared to stapedectomy[13,14].

Our results show that stapedotomy is superior to stapedectomy both in terms of reduced severity and duration of vertigo as well as short hospital stay. These results are supported by a comparative study by Hassard and Smith[13], who concluded that more complications in stapedectomy as compared to stapedotomy could be related to more surgical trauma during stapedectomy. They also found that rate of fistulae was higher in stapedectomy group.

In another review study by Woldag et al of 162 patients, vertigo after stapedectomy was studied. They reported vertigo in 28 cases, out of which vertigo lasted for 6 days in 16 patients. The authors have stressed stapedotomy as a procedure of choice.

Atacan et al in a review study of 63 patients, for post stapedectomy vertigo found statistically significant difference between the two groups one who underwent stapedectomy and the other control group. They concluded that pathophysiology of vertigo appears to be related to more utricular trauma in stapedectomy[5].

In a cross-sectional observational study by Chandarana et al, the authors concluded that a small fenestra surgery (stapedotomy) gives better functional results with fewer complications like vertigo. Similarly Magluilo et al in a review study of 141 patients undergoing stapedotomy reported the rate of vertigo after stapedotomy to 8.5% as compared to a higher rate in stapedectomy[15].

Therefore stapedotomy is preferred now a days among the ENT surgeons due to ease of procedure, better results and fewer complications as compared to stapedectomy[9-15].

Although our study strongly supports stapedotomy as procedure of choice yet there are limitations in terms of small number of patients and need for long term follow up regarding hearing improvement and vestibular symptoms.

CONCLUSION

Stapedotomy is associated with lesser postoperative complications like duration and severity of vertigo and hospital stay. Therefore stapedotomy is a better procedure as compared to stapedectomy.

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