

To Evaluate the Hearing Results Following Ossicular Reconstruction in Patient with Chronic Secretory Otitis Media

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Conflict of interest: Nil

Abstract:

Background: Chronic otitis media erodes the bone, destroys the ossicles and has the potential to cause life threatening complications.

Methods: This is a prospective study involving patients with chronic otitis media. 90 patients were included and all of them are subjected to ossicular reconstruction either by canal wall down or intact canal wall surgery.

Results: The mean (\pm SD) in group 1A pre op A-B gap was 35.45 ± 12.7 and post op A-B gap was 23.4 ± 7.18 and hence giving highly significant result i.e. $p < 0.001$. In group 1B pre op A-B gap was 36.15 ± 14.8 and post op A-B gap was 23.6 ± 8.8 and hence giving highly significant result i.e. $p < 0.001$. In group 1C pre op A-B gap was 34.55 ± 12.7 and post op A-B gap was 25.15 ± 8.59 and hence giving highly significant result i.e. $p < 0.001$. The mean (\pm SD) in group 2A pre op A-B gap was 34.15 ± 10.61 and post op A-B gap was 25.4 ± 9.19 and hence giving highly significant result i.e. $p < 0.001$. In group 2B pre op A-B gap was 36.5 ± 11.05 and post op A-B gap was 23.8 ± 7.74 and hence giving highly significant result i.e. $p < 0.001$. In group 2C pre op A-B gap was 35.5 ± 12.4 and post op A-B gap was 24.6 ± 8.24 and hence giving highly significant result i.e. $p < 0.001$.

Conclusion: All the three modalities gave statistically significant improvement ($p < 0.001$) in A-B gap leading to improvement in hearing but among the three groups there was no statistically significant ($p > 0.05$) difference found in improvement of A-B gap.

Keywords: Chronic Infection, Middle Ear, Ossicles.

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Introduction

Chronic infection of middle ear is a widely prevalent condition in India like it is in the other developing countries. Chronic otitis media erodes the bone, destroys the ossicles and has the potential to cause life threatening complications. Surgical treatment of CSOM remains one of the most challenging surgeries in otology.

The primary goal of Chronic Otitis Media surgery is to clear the disease and produce a safe and dry ear. Maintenance or improvement of hearing is important but should not be at the cost of the primary goal. There is a longstanding and largely unresolved debate as to whether these goals are best achieved by canal wall down or canal wall up procedures[1].

Over the years a great variety of materials have been used for middle ear reconstruction. The materials that provided the most successful results are the refashioned ossicles, cartilage in its different forms and various types of prosthesis i.e. synthetic (biocompatible, bioinert, bioactive) TORP and PORP. Each of them has advantages and disadvantages[2].

Minimally destroyed autograft or homograft ossicles can be refashioned and used for reconstruction. This is a safe and inexpensive method. If extensive destruction of ossicles has occurred, they will have to be replaced with other materials from tragal, conchal or nasal septal spur cartilage[3-4].

Materials and Methods

This is a prospective study involving patients with chronic otitis media. 90 patients were included and all of them are subjected to ossicular reconstruction either by canal wall down or intact canal wall surgery. autograft ossicles, autograft tragal cartilage, and synthetic prosthesis TORP/PORP was used for regain ossicular integrity.

Inclusion Criteria:

1. Patients with Chronic Otitis Media active and inactive squamous disease
2. Patient with Chronic Otitis Media – active and inactive mucosal disease

Exclusion Criteria:

1. Patients with previous history of surgery for Chronic Otitis Media —active squamous.
2. Patients with severe sensory neural hearing loss.
3. Patients not willing to participate in the study.
4. Patients medically unfit for surgery.

Observations and Result

In our study 90 patients are included in divided in 2 groups comprising 60 patient in group 1 in which Canal Wall Up technique is used all patients are having CSOM TT type and 30 patient in group 2 in which Canal Wall Down technique is used in these patients AA type CSOM is present. Both groups are further divided into 3 subgroups according to

material which is going to be used for ossiculoplasty. In group 1A and 2A autologous refashioned incus was used for ossicular reconstruction, in Group 1B and 2B autologous tragal cartilage was used for ossicular reconstruction and in Group 1C and 2C Titanium PORP/TORP ossicular implant was used ossicular reconstruction.

According to the sex of the patient Group 1A has 65% male and 35% female. Group 1B has 50% both males and females. Group 1C has 40% male and 60% females. Group 2A has 60% males and 40% females. Group 2B has 50% both males and females. Group 2C has 50% both males and females. As per the age most common group is 21-30 years of age.

Table 1: Post Operative A-B Gap in group 1

Post Operative A-B Gap	Group 1A	Group 1 B	Group 1 C
1-10 (Excellent)	0(0%)	1(5%)	1(5%)
11-20 (Good)	7(35%)	6(30%)	7(35%)
21-30 (Fair)	9(45%)	9(45%)	6(30%)
>30 (Failure)	4(20%)	4(20%)	6(30%)

Table 2: Post operative AB gap status in group 2

Post Operative A-B Gap	Group 2A	Group 2B	Group 2C
1-10 (Excellent)	0(0%)	0(0%)	1(10 %)
11-20 (Good)	4(40%)	2(20%)	4(40%)
21-30 (Fair)	3(30%)	6(60%)	2(20%)
>30 (Failure)	3(30%)	2(20%)	3(30%)

As per Wehr's classification 80% of patients in Group 1A have got improvement and 20% have failed to get improved in A-B gap, in Group 1B 75% of patients have got improvement and 20% - have failed to get improved in A-B gap and in Group 1C 65% of patients have got improvement and 30% have failed to get improved in A-B gap.

As per Wehr's classification 70% of patients in Group 2A have got improvement and 30% have failed to get improved in A-B gap, in Group 2B 80% of patients have got improvement and 20% - have failed to get improved in A-B gap and in Group 2C 70% of patients have got improvement and 30% have failed to get improved in A-B gap.

Table 3: Comparison of mean A-B gap within the group 1

		Mean	S. D.	p Value	Remarks
Group 1A	B.T	35.45	12.7	<0.001	H.S
	A.T	23.4	7.18		
Group 1B	B.T	36.15	14.8	<0.001	H.S
	A.T	23.6	8.84		
Group 1C	B.T	34.55	12.7	<0.001	H.S
	A.T	25.15	8.59		

Table 4: Comparison of mean A-B gap within the Group 2

		Mean	S. D.	p Value	Remarks
Group 2A	B.T	34.15	10.61	<0.001	H.S
	A.T	25.4	9.19		
Group 2B	B.T	36.5	11.05	<0.001	H.S
	A.T	23.8	7.74		
Group 2C	B.T	35.5	12.4	<0.001	H.S
	A.T	24.6	8.24		

The mean (\pm SD) in group 1A pre op A-B gap was 35.45 ± 12.7 and post op A-B gap was 23.4 ± 7.18 and hence giving highly significant result i.e. $p < 0.001$. In group 1B pre op A-B gap was 36.15 ± 14.8 and post op A-B gap was 23.6 ± 8.8 and hence giving highly significant result i.e. $p < 0.001$. In group 1C pre op A-B gap was 34.55 ± 12.7 and post op A-B gap was 25.15 ± 8.59 and hence giving highly significant result i.e. $p < 0.001$.

The mean (\pm SD) in group 2A pre op A-B gap was 34.15 ± 10.61 and post op A-B gap was 25.4 ± 9.19 and hence giving highly significant result i.e. $p < 0.001$. In group 2B pre op A-B gap was 36.5 ± 11.05 and post op A-B gap was 23.8 ± 7.74 and hence giving highly significant result i.e. $p < 0.001$. In group 2C pre op A-B gap was 35.5 ± 12.4 and post op A-B gap was 24.6 ± 8.24 and hence giving highly significant result i.e. $p < 0.001$.

Discussion

The primary surgical goal while treating chronic otitis media is complete exenteration of disease. Secondary aim is to improve the hearing to the extent possible with proper ossiculoplasty. All surgeries for CSOM suffer from one or the other disadvantage. The choice of treatment should ideally be one which completely clears the disease and simultaneously reconstructs the hearing apparatus in a single stage.

The mean (\pm SD) in Group 1A pre op A-B gap was 35.45 ± 12.7 and post op A-B gap was 23.4 ± 7.18 and hence giving highly significant result i.e. $p < 0.001$, in Group 1B was 36.15 ± 14.8 pre operatively and post operative was 23.6 ± 8.8 highly significant result i.e. $p < 0.001$ and in group 1C was pre op A-B gap 34.5 and post op 25.15 ± 8.5 highly significant result i.e. $p < 0.001$. On further analysis between the group the A-B gap was found to be statistically insignificant.

The mean (\pm SD) in Group 2A pre op A-B gap was 34.15 ± 10.61 and post op A-B gap was 25.4 ± 9.19 and hence giving highly significant result i.e. $p < 0.001$. In Group 2B was 36.5 ± 11.05 pre operatively and post operative was 23.8 ± 7.74 highly significant result i.e. $p < 0.001$ and in group 2C was pre op A-B gap 35.5 ± 12.4 and post op 24.6 ± 8.24 highly significant result i.e. $p < 0.001$. On further analysis between the group the A-B gap was found to be statistically insignificant and p value is > 0.05 .

Goldenberg RA et al [5] was showed that with the use of autograft incus he achieved a mean A-B gap of 18.6 dB.

Conclusion

All the three modalities gave statistically significant improvement ($p < 0.001$) in A-B gap leading to improvement in hearing but among the three groups there was no statistically significant ($p > 0.05$) difference found in improvement of A-B gap.

References

1. Yung M. Long-term results of ossiculoplasty: reasons for surgical failure. *Otology and Neurotology* 2006; 27: 20–26.
2. Dornhoffer JL, Gardner E. Prognostic factors in ossiculoplasty: a statistical staging system. *Otology and Neurotology* 2001; 22: 299–304.
3. Wehrs RE. The borrowed ossicle in tympanoplasty. *Archives of Otolaryngology* 1967; 85: 371–9.
4. Wehrs RE. The homograft notched incus in tympanoplasty. *Archives of Otolaryngology* 1974; 100: 251–5.
5. Goldenberg RA. Hydroxylapatite ossicular replacement prostheses: preliminary results. *Laryngoscope* 1990; 100(7): 693–700.