

Original article:

A comparative study between canal wall up and canal wall down mastoidectomy in cases of chronic suppurative otitis media

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Abstract:

Introduction: The past 50 years have witnessed a trend away from mandatory canal wall removal. Many otologic surgeons now prefer intact canal wall mastoidectomy with tympanoplasty except when canal wall removal is required because of extensive disease, inadequate access for cholesteatoma excision, operation on an "only hearing ear," or uncertainty of adequate follow-up.

Material and methods: The study was conducted in Tertiary Care Centre. 60 cases of age 5 to 50 years with chronic suppurative otitis media, atticofacial pathology, posterosuperior marginal pathology, cholesteatoma or granulations, secondary acquired cholesteatoma were included in the study and were randomly divided into two groups:- Canal wall up(n=30) and Canal wall down(n=30) .

Results : Distribution of pure tone audiometry was comparable between canal wall up and canal wall down. (CHL:- 76.67% vs 90% respectively, SNHL:- 3.33% vs 3.33% respectively, Mixed:- 20% vs 6.67% respectively) (p value=0.357). Proportion of patients with ossicular necrosis was significantly lower in canal wall up as compared to canal wall down. (33.33% vs 66.67% respectively). (p value=0.01)

Conclusion: Choice of a particular surgical procedure depends on the preference of the surgeon, the nature, and extent of the pathology and the general health of the patient. For more precise outcome of the study, more number of study participants is needed.

Keywords : mastoidectomy , chronic suppurative otitis media, posterosuperior marginal pathology

Introduction:

The past 50 years have witnessed a trend away from mandatory canal wall removal. Many otologic surgeons now prefer intact canal wall mastoidectomy with tympanoplasty except when canal wall removal is required

because of extensive disease, inadequate access for cholesteatoma excision, operation on an "only hearing ear," or uncertainty of adequate follow-up.¹ The popularity of intact canal wall mastoidectomy stems from the benefits of maintaining a canal wall, which include freedom from the need for frequent mastoid bowl cleanings, freedom from water intolerance and calorically induced vertigo, and less difficulty in fitting and use of hearing aids.^{2,3} In canal wall down mastoidectomy, complete disease clearance can be given. But this could be achieved only at the cost of post operative cavity problem and considerable hearing loss. Though these complications are not present in intact canal wall mastoidectomy, disease clearance could not be achieved completely in intact canal wall technique.⁴ Though the complications of CSOM can be averted, still they are on the rise due to poverty, ignorance of the patient and the non availability of facilities on time. Therefore there is a need to make public aware of the serious nature of this illness, the importance of early diagnosis and managing so as not only to reduce the morbidity and mortality but also to give them safe, dry and functioning ear.^{5,6,7} The present study has been carried out to compare the post operative results of canal wall up mastoidectomy and canal wall down mastoidectomy in patients with atticofacial or postero superior marginal pathology of chronic suppurative otitis media.

Material and methods:

The study was conducted in Tertiary Care Centre. 60 cases of age 5 to 50 years with chronic suppurative otitis media, atticofacial pathology, posterosuperior marginal pathology, cholesteatoma or granulations, secondary acquired cholesteatoma were included in the study and were randomly divided into two groups:- Canal wall up(n=30) and Canal wall down(n=30) .

Place of study: Tertiary Care Centre Duration of study:2 years

Sampling method and sample size: Simple random sampling, All cases fulfilling the criteria in a given duration.

Inclusion criteria:

- Chronic suppurative otitis media
- Atticofacial pathology – retraction or perforation
- Posterosuperior marginal pathology – retraction / perforation
- Cholesteatoma or granulations.
- Secondary acquired cholesteatoma.

Exclusion criteria

- CSOM- Tubotympanic type
- Age less than 5 years.
- Age above 50 years.
- Pregnant and lactating women
- CSOM with intracranial complications.

All patients were explained about the disease and the benefits and side effects of the procedure. Informed written consent will be taken before the initiation of the study.

Results:

Distribution of age(years) was comparable between canal wall up and canal wall down. (5 to 10 years:- 0% vs 3.33% respectively, 11 to 20 years:- 6.67% vs 10% respectively, 21 to 30 years:- 23.33% vs 13.33% respectively, 31 to 40 years:- 20% vs 26.67% respectively, 41 to 50 years:- 50% vs 46.67% respectively) (p value=0.784).

Mean \pm SD of age(years) in canal wall up was 38.1 ± 10.17 and in canal wall down was 36.5 ± 12.08 with no significant difference between them. (p value=0.581)

Table 1:-Comparison of pure tone audiometry between canal wall up and canal wall down.

Pure tone audiometry	Canal wall up(n=30)	Canal wall down(n=30)	Total	P value
CHL	23 (76.67%)	27 (90%)	50 (83.33%)	0.357*
SNHL	1 (3.33%)	1 (3.33%)	2 (3.33%)	
Mixed	6 (20%)	2 (6.67%)	8 (13.33%)	
Total	30 (100%)	30 (100%)	60 (100%)	

* Fisher's exact test

Distribution of pure tone audiometry was comparable between canal wall up and canal wall down. (CHL:- 76.67% vs 90% respectively, SNHL:- 3.33% vs 3.33% respectively, Mixed:- 20% vs 6.67% respectively) (p value=0.357).

Table 2:-Comparison of soft tissue in middle ear between canal wall up and canal wall down

Soft tissue in middle ear	Canal wall up(n=30)	Canal wall down(n=30)	Total	P value
Yes	30 (100%)	30 (100%)	60 (100%)	NA
Total	30 (100%)	30 (100%)	60 (100%)	

Table 3:-Comparison of ossicular necrosis between canal wall up and canal wall down.

Ossicular necrosis	Canal wall up(n=30)	Canal wall down(n=30)	Total	P value
No	20 (66.67%)	10 (33.33%)	30 (50%)	0.01†
Yes	10 (33.33%)	20 (66.67%)	30 (50%)	
Total	30 (100%)	30 (100%)	60 (100%)	

Proportion of patients with ossicular necrosis was significantly lower in canal wall up as compared to canal wall down. (33.33% vs 66.67% respectively). (p value=0.01)

Table 4:-Comparison of disease clearance between canal wall up and canal wall down.

Disease clearance	Canal wall up(n=30)	Canal wall down(n=30)	Total	P value
No	4 (13.33%)	2 (6.67%)	6 (10%)	0.671*
Yes	26 (86.67%)	28 (93.33%)	54 (90%)	
Total	30 (100%)	30 (100%)	60 (100%)	

Discussion:

In our study, distribution of age(years) was comparable between canal wall up and canal wall down. Percentage of patients in canal wall up and canal wall down surgery in age group 5 to 10 years was 0% and 3.33% respectively, in 11 to 20 years age group it was 6.67% and 10% respectively, in age group 21 to 30 years it was 23.33% and 13.33% respectively, in age group 31 to 40 years it was 20% and 26.67% respectively, in age group 41 to 50 years it was 50% and 46.67% respectively (p value=0.784). Mean \pm SD of age(years) in canal wall up was 38.1 ± 10.17 and in canal wall down was 36.5 ± 12.08 with no significant difference between them. (p value=0.581)

In our study, distribution of pure tone audiometry was comparable between canal wall up and canal wall down. Percentage of patients having conductive hearing loss (CHL) in canal wall up and canal wall down surgery was 76.67% and 90% respectively. Percentage of patients having sensorineural hearing loss (SNHL) in canal wall up and canal wall down surgery was 3.33% and 3.33% respectively. Percentage of patients having mixed hearing loss in canal wall up and canal wall down surgery was 20% and 6.67% respectively. (p value=0.357). In our study, all 100% patients had soft tissue in middle ear in both canal wall up and canal wall down surgery groups.^{8,9}

In our study, proportion of patients with ossicular necrosis was significantly lower in canal wall up as compared to canal wall down which was 33.33% and 66.67% respectively. There was significant difference found in this variable with p value of 0.01 In our study, there was no significant difference was seen in Hemoglobin(g/dL) with p value of 0.669, platelet count(cells/cmm) with p value of 0.24, random sugar(mg/dL) with p value of 0.61, SGPT(U/L) with p value of 0.698, SGOT(U/L) with p value of 0.281, total bilirubin(mg/dL) with p value of 0.792, serum creatinine(mg/dL) with p value of 0.235 between canal wall up and canal wall down.

Conclusion:

Choice of a particular surgical procedure depends on the preference of the surgeon, the nature, and extent of the pathology and the general health of the patient. For more precise outcome of the study, more number of study participants is needed.

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