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INCIDENCE OF REVISION MASTOID SURGERY AFTER MODIFIED RADICAL MASTOIDECTOMY

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ABSTRACT

Modified radical mastoidectomy is the treatment of choice for atticoantral or unsafe type of chronic suppurative otitis media.
In successfully performed MRM the ear should go dry and provide almost a serviceable hearing level. Unfortunately this procedure fail in good percentage of cases and surgery has to be repeated in order to achieve the objective of dry ear with serviceable hearing.
This study shows the incidence of revision surgery in modified radical mastoidectomy and identified the cause/causes of its failure and the management in 100 cases of MRM.

KEYWORDS

Cholesteatoma, Atticoantral Type Of Csom, Modified Radical Mastoidectomy (mrm), Facial Ridge.

INTRODUCTION

Chronic suppurative otitis media is typically a persistent disease insidious in onset often capable of causing severe destruction and irreversible sequalae and clinically manifests with deafness and discharge.

Chronic suppurative otitis media is classified into two categories.
1. Tubotympanic type or safe type of CSOM.
2. Atticoantral type or unsafe type of CSOM.

In tubotympanic type of CSOM the mucosal disease is confined to the eustachian tube and anterior mesotympanum but bone of the middle ear cleft is usually not involved.

Safe type of CSOM is characterized by the presence of non healing central perforation of tympanic membrane associated with chronic inflammatory changes of the mucoperiosteum of the middle ear cleft. In some cases repeated infections of safe type of CSOM occur due to contamination from external auditory canal or from insuffulation of infected material from nasopharynx.

The atticoantral (unsafe type) type of CSOM is due to the presence of cholesteatoma sac which is lined by keratinizing squamous epithelium and filled with keratin.

There is underlying bone erosion in the middle ear cleft. Erosion of the bone in the attic, aditus and antrum by cholesteatoma threatens vital structures like facial nerve, duramater, lateral sinus and labyrinth.

The medical management of CSOM consists of use of antibiotics and topical antibiotics with steroids ear drops. But most of the topical antibiotics are potentially ototoxic so the main stay in management of CSOM is surgery.

The basic principle of surgical management in CSOM is:-
1. To eradicate active disease and thus promote drainage or healing in the ear with diffuse mucosal disease and cholesteatoma.
2. To prevent the recurrence of the infection in the ear that had remained inactive
3. To prevent complication in an actively discharging ear.
4. To restore function.

Modified radical mastoidectomy is a canal wall down procedure in which all the mastoid air cells, mastoid antrum and attic is converted into a single cavity exteriorizing into the external auditory meatus. Tympanic membrane remnants with healthy ossicles are retained.

In successfully performed modified radical mastoidectomy the ear should go dry with providing a good hearing level. Unfortunately this procedure failed in good number of cases as a result of retained mucosal disease in the mastoidectomy cavity, in middle ear mucosa or due to inadequate surgery performed by the surgeon.[1]

As a result the procedure is to be repeated once twice or more in some cases.

Cavities are more likely to be dry if they are not excessively large, have a low facial ridge, an adequate meatal opening and a closed middle ear stage.[2]

AIMS OF STUDY

In surgically managed cases of chronic suppurative otitis media (unsafe type) by modified radical mastoidectomy, pathological lesions like residual cholesteatoma, retained infected mucosa in the middle ear and mastoid cavity may not allow the ear to become dry. Such cases do not respond to medical management and a revision surgery deem essential. Literature also reported that good no. of cases remains with discharging ear even after surgery.

The present study was a retrospective study of such cases those underwent modified radical mastoidectomy procedure. A total of 100 cases undergone modified radical mastoidectomy once, twice or more in the ENT Department of Ram Lal Eye and ENT Hospital/Medical College, Amritsar were called and were subjected to ENT examination with the following aims:
1. To study the incidence of revision mastoid surgery/surgeries in patients who had already undergone modified radical mastoidectomy.
2. To study the reasons of previous surgical failure.

MATERIAL AND METHODS

A total of 586 addresses of the patients who had already undergone modified radical mastoidectomy minimum one year before irrespective of the previous no. of surgeries were taken from the hospital record of the ENT Department and letters were sent to them. In response to the letters, 113 patients reported in the ENT outpatient department for the follow up. Out of these 113 cases, 100 were randomly selected and examined.

They were divided into two groups. One group included the patients who had undergone one modified radical mastoidectomy minimum one year before and the second group who had undergone one or more than one revision surgery minimum one year before. Both the groups were subjected to clinical examination and the findings obtained were recorded on prescribed proforma which included following point:
1. In local examination the status of the operated ear was seen and the percentage of dry and wet ear was obtained. In cases with wet ear the cause/ causes for the same were noted

2. Operated ear was examined for the following findings:
- Meatoplasty was looked upon whether adequate or inadequate.
- Facial ridge adequately lowered or not (High facial ridge).
- Epithelization complete or incomplete.
- Granulations present or not.
- Residual or recurrent cholesteatoma if any.
- Any fungal infection.
- Tympanic membrane perforation present / absent.

3. The status of the surgeon whether senior, junior or beginner who performed the previous surgery was noted. It was recorded to find out the success and failure rate of the previous surgery with respect to the experience of the surgeon.

RESULTS

TABLE 1 METHOD OF CONTACT AND RESPONSE OF FOLLOW UP PATIENTS

Method of contact/response	No. of cases	Percentage
Letters sent	586	100
Responded	113	19
Did Not respond	473	81

Only 19% of the patients reported for the follow up out of 586 patients.

TABLE NO 2
TYPE OF SURGERY PERFORMED PREVIOUSLY

Previous surgery Performed	No. of cases	Percentage
Modified radical mastoidectomy	92	92
Revision modified radical mastoidectomy	8	8
Total	100	100

Out of 100 cases selected randomly 92% patients had undergone modified radical mastoidectomy first time and 8% patients had undergone one revision surgery after modified radical mastoidectomy.

TABLE 3
SHOWING AGE INCIDENCE

Age in Years	No. of Cases	Percentage
0-10	1	1
11-20	28	28
21-30	41	41
31-40	15	15
41-50	10	10
51-60	4	4
60 and above	1	1
Total	100	100

Above table shows that 41% of the cases were in the age group of 21 to 30 years of age and 28% in the age group of 11 to 20 years.

TABLE 4
SHOWING GENDER INCIDENCE

Sex	No. of cases	Percentage
Male	51	51
Female	43	43
Male Child	3	3
Female Child	3	3
Total	100	100

Out of the total 100 cases 54 were male patients and 46 were female.

TABLE 5
STATUS OF OPERATED EAR ON FIRST VISIT

Status of ear	No. of Cases	Percentage
Dry Ear	76	76
Wet Ear	24	24
Total	100	100

During the first visit of follow up the operated ears were examined. In 76% cases the ear was dry and diseases free and 24% were wet due to ear discharge.

TABLE 6
SHOWING CAUSE OF REVISION SURGERY

Cause of revision	No. of cases	Percentage
In complete epithelisation	9	9
Inadequate meatoplasty	11	11
High facial ridge	14	14
Cholesteatoma	7	7
Granulations	11	11

High or inadequately lowered facial ridge (14%) contributed maximum for the failure of the previously performed surgery. Inadequate meatoplasty in 11%, granulations in 11%, recurrent or residual cholesteatoma in 7% cases were the positive findings in unsuccessful cases. In 9% cases incomplete epithelisation was noted as the naked bone beneath was unhealthy and congested after removal of unhealthy contents.

TABLE 7
STATUS OF THE OPERATING SURGEON

Result	Senior Surgeon		Junior Surgeon		Beginner	
	No. of cases	%age	No. of cases	%age	No. of cases	%age
Successful Surgery	29	90.6	46	72	1	25
Unsuccessful Surgery	3	9.4	18	28	3	75
Total	32	100	64	100	4	100

On evaluation if found that the success rate of the surgery was maximum (96%) in cases who were operated upon by a senior surgeon and minimum (25%) in case of beginners. The cases operated by junior surgeons showed a success rate of 72%.

DISCUSSION

Out of 100 patients randomly selected for the study 92% patients had undergone modified radical mastoidectomy once and 8% of the total were those who had undergone one revision surgery after modified radical mastoidectomy.

The disease was more common in young and adult population 41% of the patients belonged to the 3rd decade of life and 28% patients were between the age of 11 and 20 years.

It was found that 54% were males and 46% were female patients. The male to female ratio came out to be around 1.17 :1. In similar studies of CSOM by Gulati et al (1969) and Baruah et al (1972) male predominance was noted.[3,4]

The rural group constituted 55% of the whole study and 45% of the patients were urban. This showed that disease was much more prevalent in rural population as compared to the urban population. Studies by Hinchcliffe (1961) and Mann et al (1976) also showed CSOM to be more prevalent in rural population than the urban population.[5,6]

In this study 69% (almost 2/3rd patients) belongs to low socio-economic strata. Middle class and lower class together constituted about 94% of the total study.

Poor living condition, overcrowding, poor hygiene and nutrition had been suggested as a basis for the wide spread prevalence of chronic suppurative otitis media in the developing countries as reported in the studies by Fairbaks (1981) and Shenoi (1988).[7,8]

On clinical examination of the previously operated ear it was found that 76% had a dry disease free ear and in 24% cases the operated ears were discharging. Beales and Hynes (1958), Mills and Padgham (1991) reported in their studies that 20% and 30% of the mastoid cavities remained discharging respectively after surgery.[1,9]

Status of the surgeon and success rate of previous surgery was evaluated and it was found that out of 100 cases 64% of the cases were operated by junior surgeons, 32% by senior surgeons and only 4% by beginners.

Out of 32 surgeries performed by senior surgeons 29 (90.6%) surgeries were successful and only 3 (9.4%) were unsuccessful in contrast to the surgeries done by a beginner who had a success rate of only 25% and 75% operations were unsuccessful.

It was found that high facial ridge was the most common finding (14%), inadequate meatoplasty and granulations was present in 11%

cases each. Incomplete epithelisation was present in 9% of the patients and recurrent/residual cholesteatoma in 7% of the cases.

Nadol Jr. (1985) reviewed a series of 66 patients and found that canal or meatal stenosis or both were present in 13% of cases and a high facial ridge in 34%. [10]

Weiss et al (1992) found that the failure of the surgeries were mainly due to residual disease, inadequate lowering of facial ridge and poorly performed meatoplasty.[12]

Palva (1987) reported a recurrence of cholesteatoma in 2% of cases in canal wall down group. Castrillon et al (2000) found that in 6% cases surgical revision was needed due to residual cholesteatoma.[11,13]

Vartiainen (2000) in a ten year results of canal wall down mastoidectomies found that the recurrence rate of cholesteatoma was 17%.[14]

Cheng (2000) reviewed 8.5 years of senior authors experiences with canal wall down mastoidectomy for extensive cholesteatoma found a recurrence rate of 3.8%.[15]

CONCLUSION

In cases of unsafe type of chronic suppurative otitis media with cholesteatoma modified radical mastoidectomy is usually the treatment of choice. But in good no. of cases it had failed due to various causes and a revision surgery was needed in such cases.

CSOM is more prevalent in rural population (55%) with peoples from low socio-economic strata (69%) being the most affected. Males shows a slight preponderance (1.17%) over the females and younger age group (41%) being more affected. Only 8% of the total patients had already undergone one revision surgery.

After evaluation of 100 patients in this study, inadequately lowered or high facial ridge (14%) and inadequate meatoplasty (11%) were the most common causes of failure of MRM in majority of the patients. Residual/ recurrent cholesteatoma was found in 7% cases and granulation and incomplete epithelisation in 11% and 9% of the cases respectively.

Experience of the surgeon too accounts for the success of the surgery. The success rate of previous surgery performed by senior surgeon was 91% approximately as compared to the success rate of 72% and 25% of junior surgeon and beginners respectively. It was the incomplete technique which accounts for most of the failures.

It was found that the hearing remained same in 58% and improved in 18% cases after previous surgery. Out of the 24 unsuccessful cases 10 managed by conservative management responded well and their pure tone audiometry showed a serviceable improvement in the hearing.

A dry and safe ear was obtained in 86% of the total subjects after undergoing revision surgery and the conservative management.

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