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FAT MYRINGOPLASTY AS A DAY CARE PROCEDURE FOR SMALL CENTRAL DRY PERFORATION

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Abstract:

Aim & objectives: To assess the outcome of Fat Myringoplasty (FM) as an office procedure for small central perforation with respect to graft uptake, hearing improvement & complications

Methodology: This prospective study was carried out in Department of Otorhinolaryngology, Dr Sushila Tiwari Hospital Haldwani for a period of one year from April 2021 to April 2022. All patients attending the ENT OPD between the age group of 16-60 years with complaints of ear discharge and decreased hearing were screened by detailed history, clinical examination and otoendoscopy. All patients having COM with small dry central perforation in pars tensa i.e less than 25%-30% of pars tensa in any quadrant with dry perforation for at least 3 weeks, persistent perforation for >6 months and normal appearance of middle ear mucosa with PTA showing AB Gap of <30db were included in the study.

Result: The overall successful graft uptake rate was found to be 75 % at the end of 3rd month. The mean difference between Pre op PTA and Post op PTA along with the mean difference between Pre op AB gap and Post op AB gap was found to be significant.

Conclusion: Fat myringoplasty is considered as a safe and effective procedure. It can be easily performed for closure of small dry central perforation of TM. And performed as an office procedure, and the patient can be discharged on the same day .Bilateral surgery is also possible and postoperative care required is minimal.

INTRODUCTION

Myringoplasty is a reconstructive operation of the tympanic membrane performed to prevent reccurent ear discharge and improve hearing loss caused by tympanic membrane perforation.[1]The perforations of tympanic membrane are due to infection, trauma, or as a sequelae of tympanostomy tube insertion. Although 88% of traumatic perforations of any size heal without intervention, the remaining become chronic and require treatment.[2] Small sized perforations of tympanic membrane though do not affect the hearing too much but can result in repeated infection leading to complaints of discharge and hence affecting the quality of life of people.The small perforation of ear drum can be surgically repaired by office procedures like Fat Myringoplasty. Ringenberg[3] in 1962 first used fat as a graft material for

tympanoplasty. There are various other methods like chemical cauterisation of the margins of the perforation, perforation closure using gel foam and plasma rich platelets are also employed.[1]

In the past years, there have been several attempts to use tissue adhesives in otorhinolaryngology.[4]Also in recent years, some agents such as hyaluronic acid, pentoxifylline (Trental), epidermal and fibroblast growth factors have been tried experimentally for healing of tympanic membrane (TM) perforations.

The advantages of myringoplasty over tympanoplasty are-

1. Can be done under local anaesthesia.
2. Can be done as a day care surgery.
3. Reduces the cost and the days of absence.

The study is done to evaluate the success rate of Fat myringoplasty as an easy, cost effective and quick procedure.

MATERIALS AND METHODS

Study design: Prospective hospital based case study

Study setup: Department of ENT, Head & Neck surgery, Government Medical college Haldwani, Uttrakhand, India

Study duration: over a period of one year from April 2021 to April 2022.

Sample size: All patients attending the ENT OPD between the age group of 16-60 yrs with complaints of ear discharge and decreased hearing were screened by detailed history, clinical examination and otoendoscopy and those having small perforations were taken.

Inclusion Criteria:

1. Dry perforation for at least 3 weeks
2. Persistent perforation for >6 months
3. Normal appearance of middle ear mucosa
4. PTA showing AB Gap of<30db

Exclusion Criteria:

1. Patient with active ear discharge
2. Patient having marginal perforation, retraction, ossicular pathology
3. Not giving consent

Pre-operative evaluation included detailed ENT history and clinical examination with otoendoscopy. The site and margins of the perforation, middle ear mucosa status was inspected. Tuning fork test (256, 512, 1024 Hz) &Audiometric testing (PTA) for assessing the preoperative hearing and Air Bone gap as done. All other routine investigations were done.

Operative procedure

It was done as a day care surgery. Fat graft, about 2 times the size of the perforation was harvested from the posterior aspect of the lobule of the affected ear under local anaesthesia. Under aseptic condition the osteocartilaginous junction of the external ear canal was infiltrated with 2 ml of 2% lidocaine with 1:100,000 epinephrine divided at 4 different sites 3, 6, 9 and 12 O'clock positions. Using 0 degree endoscope the edges of the perforation were freshened with a sickle knife or with a Rosen needle and were removed with microforceps. The fat graft was introduced into the perforation and made to fit snugly like a dumbbell after filling the middle ear with gel foam for support. The fat graft was overlaid with gel foam in the external auditory canal. The canal was packed with antibiotic drops soaked pieces of gelatin sponge. Postoperatively, patients were followed up at 4 weeks for assessing healing of perforation. Evaluation of Air Conduction threshold was done by PTA and difference with preoperative AC threshold noted at 3 month along with assessment of graft uptake and for any complications (failure due to infection, residual perforation).

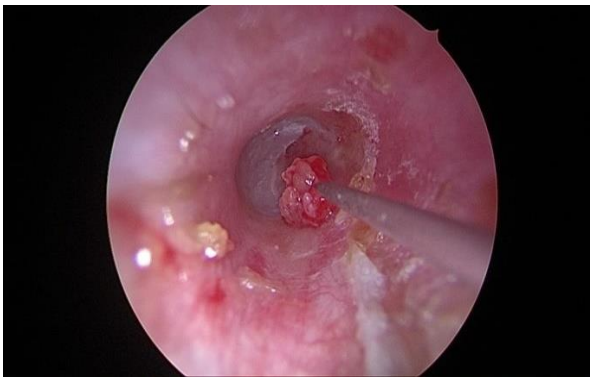

FIG 1: Fat graft being placed after freshening of margins

FIG 2: Fat graft in-situ

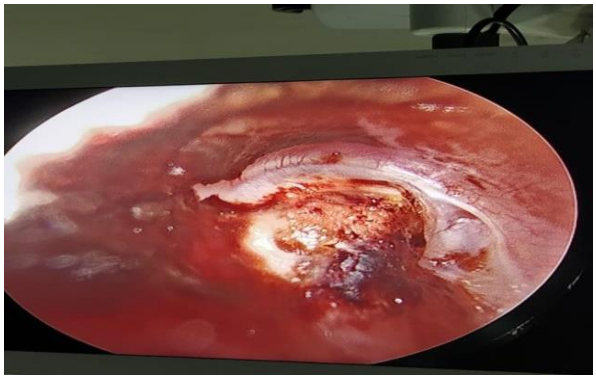

FIG 3: Yellowish hue can be seen of fat graft post-op

Statistical analysis: The obtained data was compiled. Results were statistically analyzed by using the paired *t*-test to assess the audiological outcome. The significance level was set at $P<0.05$.

RESULTS

The patients were divided in to three age groups

A: 16-30 years (30%)

B: 31-44 years (50%)

C: >44years (20%)

Age and sex wise distribution of cases

AGE	MALE	FEMALE	TOTAL
16-30	4	2	6
31-44	3	8	11
44Above	1	2	3
Total	8	12	20

Aetiology of Perforation

AGE	INFECTION (COM)	POST TRAUMA	POST TYMPANOSTOMY TUBE PERFORATION
16-30	3	2	1
31-44	6	3	2
44 Above	2	1	0

Size of perforation

	Grp A	Grp B	Grp C
Anterior Perforation	2	4	0
Posterior Perforation	1	3	2
Inferior Perforation	3	4	1

The overall successful graft uptake rate was found to be 75% at the end of 3rd month

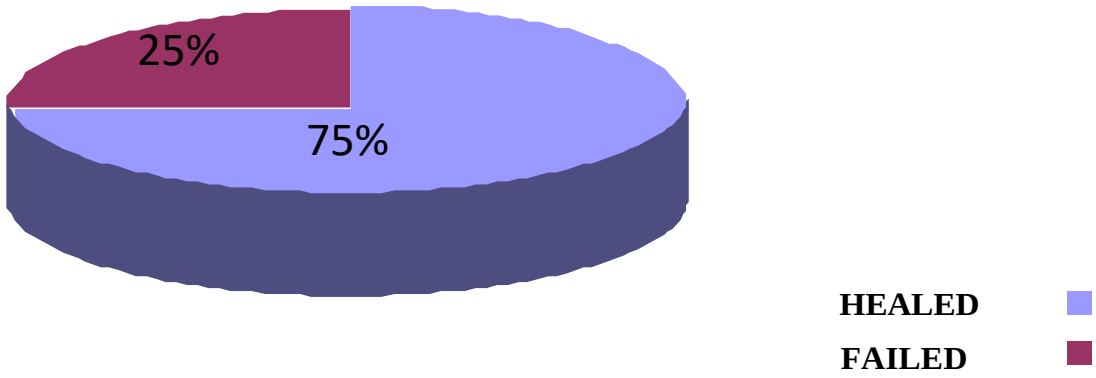

FIG 4: graft uptake vs graft failure

Comparison of pre op PTA and post op PTA & pre op AB gap and post op AB gap

	N	Mean	Std.Deviation
Pre-op PTA	20	41.30	9.348
Pre-op AB gap	20	21.00	5.929
Post-op PTA	20	39.10	9.520
Post-op AB gap	20	19.20	6.212

PTA	MEAN	STD DEVIATION	SIGNIFICANCE
PREOP–POSTOP	2.200	2.984	.004
ABGAP	MEAN	STD DEVIATION	SIGNIFICANCE
PRE OP-POST OP	1.800	2.118	.001

The mean difference between Pre op PTA and Post op PTA along with the mean difference between Pre op AB gap and Post op AB gap was found to be significant.

Age group	Outcome	
	Healed	Failed
A(16-35yrs)	04 (66.66%)	02(33.33%)
B(36-44yrs)	09 (81.81%)	02(18.18%)
C(>44yrs)	02 (66.66%)	01(33.33%)

Gender	Pre op AB gap	Post op AB gap	Improvement
Male	20.25	18.38	1.37
Female	21.50	19.75	1.75

On follow-up 3 out of 5 patients had active ear discharge in the first month and were managed conservatively and were prepared for type1Tympanoplasty thereafter. 2 patients had residual perforation and were further prepared for type 1Tympanoplasty.

DISCUSSION

The age groups were divided into three groups in our study out of which largest no of patients (11 out of 20) in the age group of 36-44 had TM perforation. A total of 8 male (40%) and 8 female (60%) patients were studied upon.

SIZE OF THE PERFORATION:There is a general consensus in literature, that smaller the size of the perforation, better suited it is for fat graft myringoplasty with higher closure rates. A small sized perforation is taken as one that is less than 30% of the total surface area of the pars tensa. Thus perforations less than <25% were chosen for this study, studies by **Sarker MZ**[5] in 2011 and **Bertoli GA**[6] in 2007 are consistent with it.

LOCATION OF THE PERFORATION: Majority of the perforations were in the inferior quadrants (antero-inferior 30% and postero-inferior 32.5%) and least number of perforations in the superior quadrants (antero-superior and postero-superior) and posterior quadrant.

ETIOLOGY OF PERFORATION: It can be seen from the results section under this heading, that 100% closure was attained with traumatic perforations while the success rate with perforations due to chronic otitis media was only 75%. The usual nature of the traumatic perforation to be small-sized makes them ideal candidates for this technique of myringoplasty.

ANALYSIS OF THE AUDIOLOGICAL GAIN: In our study the mean pre Op ABG was 21 with a standard deviation of 5.92, mean post ABG was 19.2 with a standard deviation of 6.12 which is statistically significant with P<..001. In a study done by **Sharma D**[7]et al concluded that ABG<10 dB at 500Hz post operatively improved to 82 % in case group and control group the improvement in ABG<10 dB at 500 Hz was 38%.

GRAFT UPTAKE: In our study graft uptake was in 75% patients with graft failure in 25% cases. This is attributed to the fact that Eustachian tube dysfunction in certain population delays or even reject graft uptake leading to residual perforations. In a study done by **Lyngdoh NC et al**[1] in 2019 also reported graft uptake to about 87.5% in their study cases.

Comparison between various studies done on Fat Myringoplasty[8]

Author	Ear Operated	Graft take up
Mitchell etal.	56	91
Mitchell etal.	370	92
Ozgursoy et al.	30	82.4
Chalishazar	20	90
Landsberg etal.	38	81.6
Bertoli etal.	73	80.8
Sinha etal.	24	95.8
Kim etal.	46	87
Hegazy	68	88.2
Udaipurwala et al.	22	95.2
Sharma et al(2014)	20	80
Ourstudy (2022)	20	75

CONCLUSION

Fat graft Myringoplasty with fat placed in Dumb-bell shaped fashion with gel foam is a cheap and cost effective office procedure. Thus it improves the overall success rate of Myringoplasty without any noticeable complications and can be done in both the ears simultaneously.

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