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Endoscopic Retrograde Mastoidectomy - A Review on Its Postoperative/Functional Outcome on Hearing

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Abstract:

Introduction: *Endoscopic retrograde mastoidectomy with cartilage reconstruction has a better success rate in the treatment of limited cholesteatoma.*

Objective: *To prepare cartilage graft from tragus and to compare pre-operative and Post-operative hearing.*

Methods: *35 patients with limited cholesteatoma, without intra/extra cranial complications disease were made to undergo endoscopic retrograde mastoidectomy with cartilage tympanoplasty. The study was conducted both retrospectively and prospectively.*

Results: *In this technique, patients had an average improvement in hearing upto 10-12dB.The mean post-operative period follow up was 2-6 months.*

Conclusion: *If endoscopic mastoidectomy is done accurately, endoscopic retrograde mastoidectomy with cartilage tympanoplasty appears to provide better success rates and hearing results.*

Keywords: ***Endoscopic, mastoidectomy, cholesteatoma.***

Introduction

In the late 1970s in Europe, endoscopy became available for some office-evaluations of ear-patients and a rare evaluation in the operating rooms for diagnostic purposes only.[1] Thomassin and colleagues in 1987 in France devised the first endoscopically guided otosurgery in the prevention of residual cholesteatoma.[2] Thomassin compared 36 cases of surgery for cholesteatoma performed from 1985 to 1991 to 44 cases of cholesteatoma take delivery of surgery without endoscopy from 1979 to 1985. In the first series, without the endoscopes, residual cholesteatoma was detected in 47% of cases, compared with 6% in the second series where the combination of endoscopes and microscopic approaches had been used. This landmark article showed a considerable reduction in residual cholesteatoma attributed to the advent of endoscopic evaluation of blind spots encountered during the primary surgery.

The anterior epitympanum and the retrotympanum are anatomic sites that are difficult to access under otomicroscopy. Otoendoscopy offers a large field of vision using direct vision and lateral vision endoscopes, particularly in the supratubal recess and sinus tympani, for which visualization is excellent with reduced surgical approaches.[3]

Patients and Methods

A) Patient population

From July 2015 to March 2016, endoscopic retrograde mastoidectomy with cartilage tympanoplasty was performed using tragal cartilage in 35 patients. (Out of which, 22 were male and 13were female, age ranging from 20-50 years).

Of all the cases selected for the study, all were primary procedures. Of the procedures done, 25 cases were with postero-superior retraction pockets, 10 cases were with attic cholesteatoma. Cartilage and temporalis fascia graft were used in all 35 patients. For all the cases, endoscopic retrograde mastoidectomy with cartilage tympanoplasty was done.

Type 1 tympanoplasty was performed for 13 patients, type 3 for 22 patients. All the cases were done in single centre, Upgraded Institute of Otorhinolaryngology, Chennai. The procedure was done by a single surgeon. The following parameters were studied: graft take up, change between pre and post op pure tone audiogram showing improvement in air bone gap, residual and recurrent disease.

If there is no perforation, retraction or lateralisation, it is labelled as successful graft uptake. The PTA-ABG for each audiogram was made out by calculating the mean air bone

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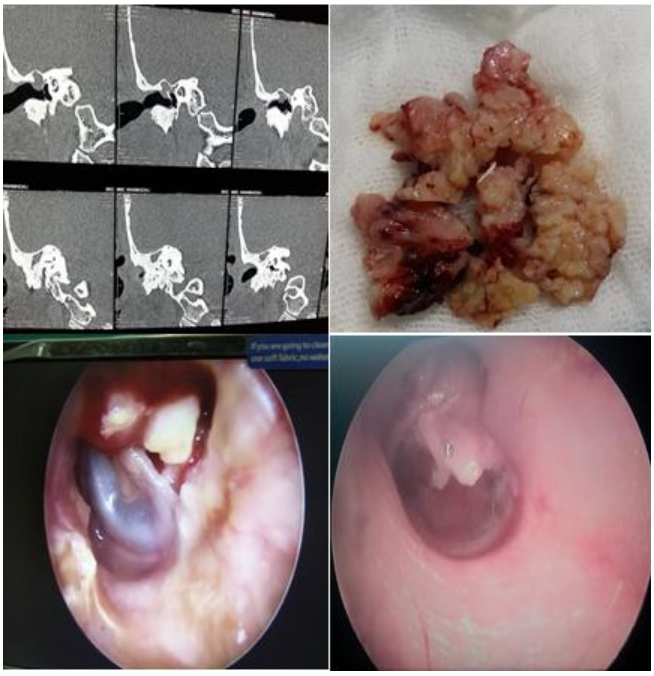
gap at 500, 1000, 2000and 4000Hz. Pre and post-operative audiograms were compared using 't' test.

Institutional ethical committee clearance and patient consent was obtained for the study.



B) Pre-operative evaluation

An audiogram is performed preoperatively at the following frequencies: 500, 1000, 2000 and 4000Hz.

C) Surgical procedure

Rigid endoscopes were used for all procedures. A wide posterior tympanomeatal flap was elevated transmeatally, and the scutum was removed with a bone curette or was drilled until visualization of cholesteatoma extension and the mastoid antrum. The malleus and incus were removed when they were involved in the cholesteatoma or restricted access to it. When present, the stapes was left intact. Endoscopic accessibility was defined by no extension of the cholesteatoma beyond the level of the lateral semicircular canal. Scutumplasty was done with tragal cartilage, and tympanic membrane defects were reconstructed with the palisade technique.

D) Post-operative evaluation

An audiogram was repeated at least 3 months post operatively. Follow up examination of the graft was done at 3, 6, 12 months postoperatively.

E) Statistical Analysis

Paired Samples Statistics

		Mean	N
Pair 1	PRE OP HEARING LOSS	40.38	35
	POST OP HEARING LOSS	30.94	35

Discussion

Tarabichi M[4] et al has conducted a study in 38 patients and concluded that endoscopic removal of cholesteatoma offers a safe and effective transcanal alternative to postauricular procedures.

Ayache et al[5] conducted a study on 350 patients and concluded that analysis using otoendoscopy reduces the incidence of residual cholesteatomas by identifying lesion extensions that are overlooked under otomicroscopy.

Migirov L[6] et al conduced a study on 30 patients and concluded that the minimally invasive endoscopic ear surgery allowed complete eradication of cholesteatoma from the middle ear and its extensions, with minimal morbidity and good functional results.

Hamed Sajjadi[7] et al conducted a study on 249 patients and concluded that endoscopic resection of cholesteatoma following detailed microscopic surgery has reduced the incidence of residual cholesteatoma detected on second-look surgery to a very low rate of 9.7% in closed cavity cases.

Cabra et al[8] has reported cartilage palisade technique and reported a higher morphological success in cartilage(82.3%)than fascia(64.4).Post operative air bone gap for cartilage was 62.5% versus fascia 73.9%

Mohammed Badr-El-Dine[9] conducted a study on 60 patients ad concluded that endscopic assisted ear surgery has many advantages in cholesteatoma surgery and helps to achieve effective control over the disease

SUMMARY AND CONCLUSION

Endoscopic retrograde mastoidectomy has the following advantages over conventional mastoidectomy:

1) Day care surgery
2) No cavity problem
3) Canal skin is preserved
4) No external scar
5) Excellent visualization of mesotympanic structures
6) Direct visual control of hidden areas such as anterior epitympanic spaces, retrotympanum and protympanum.
7) Our study has shown improvement hearing upto 10-12 dB.

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