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Research Article

A COMPARATIVE STUDY OF AUTOGRAFT MATERIALS AND OUTCOME OF MYRINGOPLASTY

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ABSTRACT

Objective: To compare suitability of nasal septal perichondrium and temporalis fascia grafts for myringoplasty.

Methodology: Twenty seven patients in 22-51 year age range, having persistent symptomatic eardrum perforation, were included in study. Twelve of them also had nasal obstruction, due to nasal septum deviation. These later patients underwent simultaneous septoplasty along with the transmeatal myringoplasty procedure and nasal septal perichondrium was used for grafting TM defect in them. In the remaining 15 cases, myringoplasty was done with temporalis fascia graft.

Results: Eleven, of the 12 cases in septal perichondrium grafting and 13 of the 15 cases in conventional temporalis fascia grafting, had successful graft uptake. Both groups also had, more than 5dB HL improvement in conductive hearing thresholds, in at least, three tested frequencies.

Conclusion: In cases of septoplasty with myringoplasty, use of nasal perichondrium as graft material gives equally good results and offers many advantages over temporalis fascia graft.

Keywords: Myringoplasty, Otitis media, Septoplasty.

INTRODUCTION

Autografts from temporalis fascia, perichondrium and cartilage have been used to cover tympanic membrane perforation. These offer advantage of good regeneration without immunological problems. In patients with chronic otitis media, if nasal septum deviation coexists, it is preferably corrected before tympanoplasty procedure. In present report, myringoplasty with simultaneous septoplasty endeavour is studied, along with myringoplasty alone. Also, nasal septal cartilage perichondrium was used as graft material for myringoplasty in these patients. Postoperative success of myringoplasty was evaluated for the two practices in specified groups of patients.

PATIENTS AND METHODS

A prospective study was carried out, between, August 2015 to April 2016, in the otolaryngology section of Sri RLNM charitable trust hospital, varanasi, northern India. The study covers 27 adult patients of either sex with symptomatic tympanic membrane perforation, without otorrhea. Study protocol was approved by local ethical board and patients were included in the study, following, written informed

consent. All patients had persistent tympanic membrane perforation due to chronic otitis media. Twelve, of the patients, also had symptoms of nasal obstruction concurrently. The TM perforations were dry, for at least 3 preceding months. Otomicroscopic examination was done, to establish, site and size of the perforations. Perforations were deemed small, if less than 3mm wide and medium, when between 3 to 6 mm wide. Pure tone audiometry was conducted in all patients, 2 days prior to surgery.

Patients were assigned to 2 groups. Group A, had 12 patients, in which nasal septal perichondrium was used, as autograft material and Group B, had 15 patients, in whom, temporalis fascia autograft was used to close TM perforations. Nasal septal perichondrium was obtained during septoplasty. Perichondrium was spared while elevating mucoperichondrium, and subsequently separated from cartilage and dissected out. Myringoplasty was done through transmeatal approach employing underlay technique.

In group A (n=12), nasal septal perichondrium sheet was cut 2mm larger than diameter of the perforation to be corrected and placed under remaining eardrum, positioned over the malleus handle, in order, to gain better stability to the graft. In group B (n=15), temporalis fascia was harvested, by postauricular incision and was used for grafting the defect of

TM, adopting similar method. Appropriate sponge-gel filling, of tympanic cavity and external ear canal dressing, were done. Follow up

Septoplasty cases were seen on 5th day to remove nasal splints. The external ear canal dressing was removed on 10th postoperative day at outdoor setting. Subsequently, regular monthly follow up was observed. At 3 months, postop, pure tone audiogram was obtained. Outcome parameters included 1) graft survival; 2) hearing gain and closure of air-bone gap (ABG); and 3) presence or absence of any discharge. Intact graft, at the end of 3 months, with more than 5dB HL hearing improvement in three consecutive frequencies, in range of 0.5, 1, 2 and 4 KHz in tonal audiometry were taken as indicator of success.

RESULTS

The differences, between various outcomes of the two groups, were tested statistically, by application of students 't' test, however, there were no instances, of any statistically significant differences. Hence the mean values are narrated in results and consequent discussion.

The study sample comprised of 11 male and 16 female patients, in age range of 23 to 51 years, with 36 year as median age. Patients with left ear perforation numbered 10 and right ear 17. All perforations were between 2mm to 5mm wide and located exclusively to posterior and inferior quadrants of the TM. Fifteen perforations were small and 12 were medium sized. Patients were never before operated on the affected ear. During operation tympanic cavities were found normal and there were no ossicular chain defects. The middle ear mucosa was normal and there was no discharge. The 12, group A patients, had nasal septal deviation, that moderately obstructed the nasal passages. There were no postoperative complications and nasal mucosa remained healthy throughout the follow up.

Myringoplasty outcome

Eleven of 12 grafts, in group A, were successfully taken up. Two perforations failed to close due to infection and graft necrosis. In group B, 13 of 15 grafts were taken up successfully. One patient did not have perforation closure due to infection and necrosis. No significant difference arose between success rate of two groups.

Hearing results

The mean preoperative air conduction thresholds at 250-8000 were 43.4dB for group A and 42.2dB for group B. The mean preoperative bone conduction threshold, at 500-4000Hz was 17.6dB for group A and 16.7dB for group B. The mean preoperative air-bone gap, ABG was 25.8dB and 25.5dB for groups A and B, respectively.

After operation, the hearing gain at 250-8000Hz was 13.3 dB and 13.4dB for respective, A and B groups. The mean postoperative ABG, calculated as the difference between postoperative, air and bone conduction thresholds at 500-4000Hz, was nearly equal in both groups. In either group, 2 patients each, attained closure of ABG. No significant difference arose among outcome of group A and B.

DISCUSSION

In the present study, patients from group A, did not get any post operative ear complaints, specifically relating to, septoplasty. Thus myringoplasty and septoplasty procedures may be carried out together safely. The perichondrium is a reservoir of mesenchymal stem cells, which are dividing cells, apt to seal tissue defects¹⁻³. In the study, the graft survival rate and postoperative hearing improvement in conductive hearing thresholds, were better than many reported case series³⁻⁶.

Age of the patient, site and size of perforation, status of middle ear mucosa, function of eustachean tube, smoking, type of anaesthesia, surgical technique and graft material, are all, influential determinants of surgical outcome⁷⁻⁸. Reperforation is commonest mode of myringoplasty failure. No retraction pocket formation occurred postoperatively, in TM, in the study patients. Structural power of perichondrium may, therefore, prevent the autograft, from subsiding in to the middle ear. The good success rate in the cases may, partly, be due to site of perforations, as anterior TM perforations associate less surgical success^{4,9}. Posterior and inferior TM perforations also yield, better surgical improvement in conductive hearing loss. Further, only small and medium sized perforations are expected to yield, better surgical correction¹⁰. All the cases included, were with dry ear, for at least 3 preceding months, which must have assured very low instances of infection e.g. 3 of 27 patients.

CONCLUSION

Study, thus, reveals, that myringoplasty, with simultaneous septoplasty, is convenient, cost effective, time saving and hence, patient friendly option. The nasal septal perichondrium graft is, as good, as temporalis fascia graft, for myringoplasty. In nasal obstruction cases, it obviates the need for postauricular cut, to harvest temporalis fascia and perichondrium seems, theoretically, more promising tissue, for fault correction.

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