

## Inlay Myringoplasty Using “Butterfly” Cartilage Technique: A Study at KIMS, Kohat

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### ABSTRACT

**Aim:** To determine the effectiveness of inlay butterfly Cartilage Myringoplasty. Twenty (20) patients were selected who underwent inlay butterfly cartilage myringoplasty from June 2009 to June 2012 at ENT department of KIMS Teaching Hospital, Kohat. All patients had small to medium sized perforations with inactive mucosal disease. All patients were evaluated both pre-operatively and post-operatively through examination, otoscopy, pure tone audiogram and examination under microscope (EUM).

**Results:** All patients operated by this procedure were followed for one year. They were followed through pure tone audiometry and otoscopy. The grafts were taken in 15(75%) patients. In 5 patients, there was residual perforation. The air bone gap was decreased significantly (pre op 33.75 db, post op 13.5 db) with  $p < 0.05$  (significant).

**Conclusion:** Myringoplasty by inlay butterfly cartilage technique is effective in making the ear safe and improving hearing. It is also a simple and rapid procedure compared to well establish temporalis fascia graft technique either by underlay or onlay method.

**Keywords:** Myringoplasty, inlay butterfly cartilage

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### INTRODUCTION

Tympanoplasty is the surgical technique in which tympanic membrane and/or ossicular chain is repaired or reconstructed. If the procedure is limited to repair of tympanic membrane only, it is called myringoplasty. Zollner (1995)<sup>1</sup> and Wullstein (1956)<sup>2</sup> are rightly considered to be the pioneer of tympanoplasty techniques. They introduced 5 types of tympanoplasties. Later on different methods of tympanoplasties were introduced i.e. onlay and inlay or underlay. Rizer (1997)<sup>3</sup> published his study comparing both techniques in more than 700 cases and they found reliable results. At the same time different graft materials were used i.e., skin, autologous cheek mucosa, autologous vein graft. Later on more simpler procedure with freshening of perforation margins and then putting a graft i.e. perichondrium, adipose tissue and Alloderm<sup>4,5</sup>. But temporalis fascia and perichondrium are still the most commonly used grafting material. Cartilage tympanoplasty produced comparable results in term of graft taking and hearing results to tymporalis fascia<sup>6,7</sup>.

In 1998, Eavey<sup>8</sup> described the newer procedure i.e. inlay butterfly cartilage tympanoplasty. This

method is efficient, rapid and can be easily performed through transcanal approach and effective closure of small to medium sized perforation can be achieved.

### PATIENTS AND METHODS

Twenty patients were included in our study who were operated for perforated tympanic membrane during 2009 to 2012 at Deptt of ENT, KIMS Kohat. Only those patients were selected who had dry ears for at least 4 months with small to medium sized perforations and inactive mucosal disease. So this study was limited to simple repair of tympanic membrane. External auditory canal of all patients was wide enough and was cleaned of wax. Pure tone audiogram of all patients was performed before surgery.

Among 20 patients, 12(60%) were female and 8(40%) were male. The mean age of patients was 32 yeas (range 16 to 55 years). Surgery was performed through transcanal approach under general anesthesia with endotracheal intubation. First of all, graft is obtained from tragal cartilage with intact perichondrium. Incision was stitched with 4/0 silk. The graft was then fashioned according to the size of perforation keeping in mind that graft size should be 1-2 mm more than the size of perforation. Graft was grooved deeply between two sheets of perichondrium with surgical blade no. 15 all along the margins. The graft was then inserted through perforation in such a way that margins of perforation are sandwiched in the

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groove of graft. The external canal was packed with anti-septic soaked gauze. They were given prophylactic antibiotics. Patients remained in hospital for 2 days. They were discharged on 3<sup>rd</sup> day and were advised to come to ENT OPD on 7<sup>th</sup> post op day to remove pack from ear. Patients were instructed to visit ENT OPD after 1 month for otoscopy and pure tone audiometry. They were regularly evaluated after every 2 months with otoscopy and PTA.

## RESULTS

All data was analyzed by paired sample t test. Out of 20 patients, graft was taken in 15 and in 5 there was residual perforation with functional and anatomical success rate of 75%. The anatomical success was assessed by otoscopy with graft well set in place. While functional success was analyzed by PTA, which showed decrease in A-B gap in 16 patients. This decrease in A-B gap was more than 20 db( pre op AB gap =33.75db, post op AB gap was 13.5db with  $p<0.05$ ). Out of 5 patients in whom the graft was not taken and there was persistent perforation, 2 patients had upper respiratory tract infection in the immediate post operative period and there was discharge in external canal. In one patient graft was lying in external auditory canal. All patients were followed regularly every week for first month and then after every 2 months.

## DISCUSSION

Since the introduction of types and techniques of tympanoplasty, many studies have been conducted and reported in world literature. At the same time, different graft material has been used. If there has not been any discharge from the ear or any moisture in the ear during last 6 months, myringoplasty alone can be performed. Although there is theoretical risk of graft medialization with inlay method or lateralization with onlay methods respectively, but still these both are most favored techniques. However when the perforation is total ,it should be kept in mind that anterior half of the graft has tendency to pull away from the drum and there will be residual perforation.

This technique of inlay butterfly cartilage tympanoplasty is relatively new and was first described by Eavey (1998)<sup>8</sup>. Graft act as a bridge, squamous epithelium migrates on its lateral side, while middle ear mucosa on its medial side. The graft becomes part of membrane. The basic aim of myringoplasty is to make the ear safe and at the same time improve the hearing. The functional and

anatomical success in our study was 80%. Ghanem et al (2006)<sup>9</sup>, Wang and Lin (2008)<sup>10</sup> and Roy et al (2013)<sup>11</sup> showed clinical success rate of 92%, 85% and 92% respectively. Slight variation in the results is probably due to the fact that some studies were conducted on young children and in some studies, size of perforation was variable.

In this study, we selected small to medium sized perforations in clean & dry ears with inactive mucosal disease. On otoscopy, the external auditory canals of all the selected 20 patients were cleaned. So inlay butterfly cartilage Myringoplasty was appropriate in those cases and this can be done quickly and reliably.

## CONCLUSION

Inlay butterfly cartilage myringoplasty appears to be effective and safe in terms of anatomical & functional success with closure of perforation to make the ear safe. At the same time, AB gap can be decreased and good hearing can be achieved. The results are also comparable with those studies in which temporalis fascia grafts were used. Effectiveness and simplicity makes the inlay butterfly cartilage tympanoplasty a better option.

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