

MYRINGOPLASTY IN CHILDREN-RETROSPECTIVE ANALYSIS: A CLINICAL STUDY

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ABSTRACT: Myringoplasty is the surgical closure of the perforation of pars tensa of the tympanic membrane. Perforation of the tympanic membrane in children can cause significant disability. It is a simple and effective procedure that results in the successful closure of the perforation in most cases. This retrospective study was conducted in our hospital, for 06 years. Myringoplasty is a beneficial procedure in the pediatric population in the hands of a skilled and experienced surgeon. This paper will discuss the success rate of perforation closure, improvement in hearing and complications during surgery and postoperative period in pediatric age group.

KEYWORDS: Children, Hearing, Myringoplasty, Perforation, Tympanic membrane.

INTRODUCTION: Perforation of the tympanic membrane results from middle ear infections, trauma or iatrogenic causes, up to 80% of these perforations heal spontaneously.⁽¹⁾ The remaining group need surgical repair known as myringoplasty, closure of the perforation of the tympanic membrane. When myringoplasty is combined with ossicular reconstruction it is called tympanoplasty. Myringoplasty introduced by Berthold,⁽²⁾ was further developed by Wullstein⁽³⁾ and Zollner.⁽⁴⁾



Fig. 1: Normal T.M



Fig. 2: Perforation in Pars tensa

Ear surgery in children is less successful because of enlarged adenoids and tonsillitis which are responsible for poor eustachian tube function and repeated ear infections, several factors may affect surgical outcome such as the surgical approach (Endaural, Postaural) and surgical technique (Underlay vs overlay), site of perforation and type of graft utilized. However there is still uncertainty about the prognostic factors in myringoplasty and there are significant variations in the reported success rates for achieving an intact tympanic membrane after surgery. Therefore, it is now becoming apparent that re-perforation following myringoplasty may occur several years after the initial surgery.⁽⁵⁾ The rate of success of pediatric tympanoplasty is likely not a matter of age, but a matter of patient selection. Careful attention to factors such as technique, eustachian tube function and site and

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size of the perforation will likely increase in the success rate of an Myringoplasty with improvement in hearing. Some studied regarding age relation, but age itself should not be an indication or contraindication to surgery.

Fig. 3: Steps of Myringoplasty.

- A. Harvesting Temporalis fascia graft.
- B. Elevating Tympano- meatal flap.
- C. Middle Ear Structures after elevating TM flap.
- D. After inserting the temporalis fascia graft medial to the remnant of Tympanic membrane.



Fig. 3A



Fig. 3B



Fig. 3C



Fig. 3D

Pediatric myringoplasties were performed as early as 1962 in different parts of the world, since then so many studies have been conducted, reported success rates between 58% and 96%,⁽⁶⁾ never the less a meta-analysis concluded that there was no difference associated with age in the success rate of myringoplasty.

Aim of this study is to analyze the success rates of myringoplasty in children, to assess prognostic factors and to evaluate their interaction in the evolution of myringoplasty.

MATERIALS AND METHODS: This study was conducted in the department of ENT at Govt. ENT Hospital, Osmania Medical College, and Hyderabad from February 2004 to January 2008 and from July 2012 to June 2014 (6 years). Total 128 children age group between 6 to 15 years, who

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underwent myringoplasty in our hospital. The mean age at the time of operation was 12 years. All the children had central perforation that had remained dry for a minimum period of 08–12 weeks with a good cochlear reserve as assessed by pre-operative pure tone audiometry. All the children were operated by post aural approach by a senior surgeons under general anesthesia, the temporalis fascia graft harvested and positioned medial to the tympanic membrane remnant using the underlay technique, hospital stay is of 3 days under antibiotic coverage than discharged on 5th day all the patients were followed up to 1 year.

Successful closure of perforation was defined as an intact ear drum at 1 year post operatively, the data regarding successful closure of perforation, factors influencing success rate and hearing improvement was recorded.

RESULTS: We have noticed that success rate was slightly better in 12-15 years of age group as compared to age group of 6 to 11years, closure of perforation was successful in 107(90.8%) of 128 patients, failure of graft occurred in 21 patients, out of 21 cases that had failed, 17 cases were found to have oedematous or inflamed middle ear mucosa at the time of surgery and 4 cases were having a very big adenoids with mild NSOM, also out of these 21 cases that had failed 14 cases had complete graft rejection and 07 out of it had small residual perforation.

Audiological improvement was seen in 92(81%) patients out of whom 68 cases had 10-15 db air bone gap (Mean pre-operative and post-operative air-bone gap: 25.2±7.1 vs 12.4±5.8 db respectively) 15 cases had 15.20 db air-bone gap (Mean pre-operative and post-operatively air-bone gap: 35.3±5.2 vs 15.4±4.9 db respectively). Hearing was found to be worse post operatively in 9 patients, while no change was noticed in the remaining 12 patients. There was no case of profound hearing loss. Other factors that contributed in the outcome of myringoplasty (Table-I), were duration of ear discharge, period of inactivity, size of perforation, status of contralateral ear and condition of middle ear mucosa. We noticed a higher success rate when there is short duration of ear discharge, longer period of dry ear and small size of perforation.

Complications During Surgery: we have not encountered any complications during surgery, but post operatively 5 patients were reported taste disturbance, 6 patients had having post-operative gaping of wound which was treated conservatively. 2 patients were developed allergic reaction to the medicated dressing in the ear canal treated, accordingly.

Contributing factors	No. of cases	Success Rate (%)
Age		
12 - 15 years	80	89.3%
06 - 11 years	48	82.8%
Duration of dry ear		
> 12 weeks	26	27.9%
10 - 12 weeks	58	52.1%
08 - 10 weeks+	44	38%

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Size of Perforation.		
Central perforation	102	95.2%
Sub Total	26	68.3%
Duration of ear discharge		
1 – 2 year.	76	69.8%
3 – 5 year	32	92%
6 – 10 year	20	12%
Status of Contralateral ear		
Normal	101	96.4%
Perforated	27	10.2%
Table 1: Factors influencing success rate of myringoplasty		

DISCUSSION: Myringoplasty is a simple and effective procedure that results in the successful closure of the perforation in most cases, perforation of the tympanic membrane in children can cause significant disability. The myringoplasty will reduce the complications related to chronic supportive otitis media like, loss of hearing, persistent perforation syndrome, this demands the early closure of perforation. However there seems to be no consensus among ENT surgeons regarding the benefits of myringoplasty in children in relation to the age. It is usually straight forward procedure with a good success rate, many studies reported a success rate from 35% to 95% in children.

Timing of repair in the pediatric population is very controversial, Kessler⁽⁷⁾ reviewed the results of 209 myringoplasties and concluded that even in young patients (2-6years) myringoplasty has a high success rate (75-94%) and that age alone could not be considered a contraindication to surgery. Lau and Tos⁽⁸⁾ found no significant difference in outcome between the 2 to7 age group and those children ages 8 to14, they suggested that early operation may prevent progression of ossicular chain resorption.⁽⁹⁾ They concluded that myringoplasty had a good chance of success at any age. Glasscock⁽¹⁰⁾ have reported a 96% success rate using the underlay technique with temporalis fascia graft, but in children it will be less since the young children prone to otitis media and URTI's, Koch⁽¹¹⁾ reported an 81% success rate for children age 8 and older, but only a 30% success rate in younger patients. They concluded that tympanoplasty before age 8 results in a high rate of failure because of poor eustachian tube function and frequent URTI's. Ophir⁽¹²⁾ reported a 79% overall success rate and their success in younger children (5-8 years) was comparable to the rate for older children. The results of myringoplasty depends on the criteria for selection of patient and technique of surgery used and length of follow up, the success rate in closure of perforation is reported to be between 74% and 91%⁽¹³⁾ in children.

The present study was conducted on patients aged 6-15 years and the result of successful graft uptake was 88.3% which is comparable to the results of various authors.^(12,13,14) The reason for variation in results of these authors could be attributed to the wide range of age that differs in various studies, because of technique used, varying length of follow up and experience of surgeons. The post-operative air-bone gap was less than 20db in our study in 79% of cases comparable to other authors ^(15,16) while no change in hearing was noted in 12 patients.

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CONCLUSION: Myringoplasty is a safe and effective procedure in the hands of a skilled and experienced surgeon in children, and also to improve the quality of life of patients, avoiding continuous infections thus preventing the complications. We advocate early myringoplasty preferably above the age of 6 years, delaying surgery can cause permanent damage to middle ear structures and the inner ear. This article discusses an over view of the commonly reported factors which are thought to effect the success rate of myringoplasty in pediatric age group.

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