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ORIGINAL ARTICLE

Outcome of Posterosuperior Based Flaps in Subtotal Tympanic Membrane Perforations

ARIA MASOOM[1], ABDUL MANAN KHAN[2]
[1]Associate Professor, Department of ENT, Bolan Medical College / Complex Hospital, Quetta
[2]Associate professor ENT Bolan Medical College SPH Quetta
Correspondence to: Abdul Manan Khan, Email: mk1803754@gmail.com

ABSTRACT

Background: Tympanic membrane perforation is a major ear disorder that negatively affects the life of a person.
Objective: The aim of this study was to find out the outcomes of Posterosuperior Based Flaps in Subtotal Tympanic Membrane Perforations.
Material and methods: The current case series study was conducted at the Department of ENT, Bolan Medical College / Complex Hospital, Quetta from August 2022 to January 2023 after taking approval from the research committee of the institute. A total of 104 individuals with chronic suppurative otitis media of tubotympanic type with dry central perforation were included. The individual provided written and informed consent. An x-ray of the sinuses, mastoids, and pure tone audiogram were performed. Each detail, including name, age, sex, and address, was noted. SPSS version 17 was used to analyze all of the data that was gathered.
Results: A total of 104 cases were included in this study out of which 62 (59.6%) were female and 42(40.3%) were male. Most of the participants were in the age group 31-40 years old 22.1%. 51 individuals (82.2%) who had PS-based flap surgery reported improved hearing after receiving a graft, whereas 11 (17.7%) did not get a graft and continued to exhibit conductive hearing loss. In participants where the PS flap was not used, 32 (77.0%) had received a graft, whereas 10 (23%) had not and were deaf and had continuous discharge.
Conclusion: The current study concluded that a posterior superior based flap in a subtotal perforation increases the blood flow to the graft center, improving the graft absorption rate and raising the success rate.
Keywords: Outcome; Posterosuperior; Flaps; Subtotal Tympanic Membrane; Perforations

INTRODUCTION

Myringopasty is a surgical technique used to seal a tympanic membrane perforation in the parstensa.[1] It is recommended when there is a perforation in the tympanic membrane's parstensa accompanied with conductive hearing loss and intermittent discharge.[2] Depending on the extent of the external auditory meatus, the visibility of the perforation margin, and the surgeon's individual experiences, many surgical techniques are employed for fixing the perforated tympanic membrane.[3-4] The tympanic membrane gap is closed using a variety of autologous materials, including cartilage, vein, tragal perichordium, and temporalis fascia.[5] The most popular graft in myringoplasty is temporalis fascia because to its easy absorption and low metabolic need.[6-7] Trauma or middle ear infection are the two main reasons of perforation. By keeping the ear dry, conservative therapy can repair the majority of traumatic perforations.[8-9] There are four types of middle ear infection-related perforations: small, medium, big subtotal, and total.[10-11] If the ear is maintained clean and the predisposing factors, such as a deviated nasal septum, sinusitis, and nasopharyngeal infection, are avoided, small and medium-sized perforations will heal on their own.[12] It is necessary to surgically seal large, subtotal, and total perforations.[13] Using a thick skin graft, Bertld was the first to do surgery to heal a T.M. perforation in 1878. Later, Wulstein and Zolnner used split skin grafting to do myringoplasty.[14] Work on the surgical repair of TM was later carried out. Various procedures employed a variety of graft materials. The three most often employed approaches are sandwich, underlay, and overlay.[15] The graft is positioned medial to the remaining TM as well as the handle of the maleus in overlay, and lateral to the fibrous layer of TM in underlay.[16] In the sandwich approach, the graft is positioned on the exposed meatus bone, posteriorly between the remains of the TM and PS flap, and anteriorly beneath the T.M.[17] the present study was carried out to find out the outcomes of postero-superior based flaps in subtotal tympanic membrane perforations.

MATERIAL AND METHODS

The current case series study was conducted at the Department of ENT, Bolan Medical College / Complex Hospital, Quetta from January August 2022 to January 2023 after taking approval from the research committee of the institute. A total of 104 individuals with chronic suppurative otitis media of tubotympanic type with dry central perforation for at least 2 months with no complication of both genders and different age groups (ranged 15-55 years) were included. Individuals with Persistent ear discharge, acute external otitis, active sinu-nasal illness, marginal perforation, and probable cholesteatoma were excluded. Temporalis fascia graft and PS flap were employed in 62 individuals, whereas temporalis fascia graft was used only in 42 individuals. A post-aural technique was employed in 16 instances, whereas an endaural method was used in 11. The transcanal technique was used to operate on the remaining 77 individuals. Each case was operated on using 2% xylocaine and a local anesthetic (L/A) of 1 in 100,000 adrenaline. 42 individuals had underlay surgery, while 62 patients received a temporal fascia graft in addition to a PS-based flap. Through sequential sampling from the OPD, all of the patients who met the diagnostic criteria were selected. The individual provided written and informed consent. Basic investigations such as full blood count, blood coagulation profile, and virology were conducted, along with history such as prior experiences of any surgical intervention. An x-ray of the sinuses, mastoids, and pure tone audiogram were performed. Each detail, including name, age, sex, and address, was noted. SPSS version 17 was used to analyze all of the data that was gathered. After the surgical procedure the participants were follow up for 3 month to determine the outcomes. Detail information of each participants including name, age, sex, and address was noted. SPSS version 17 was used to analyze all of the data. For qualitative variables like gender & graft take rate, frequency was computed. In order to determine an effect modifier, means and standard deviations were computed for quantitative variables such as the patient's age and the graft take rate were categorized by age and gender. Tables and charts were used to display the results.

RESULTS

A total of 104 cases were included in this study out of which 62 (59.6%) were female and 42(40.3%) were male. Most of the participants were in the age group 31-40 years old 23(22.1%) as presented in table 1. 51 individuals (82.2%) who had PS-based flap surgery reported improved hearing after receiving a graft, whereas 11 (17.7%) did not get a graft and continued to exhibit conductive hearing loss. In participants where the PS flap was not

used, 32 (77.0%) had received a graft, whereas 10 (23%) had not and were deaf and had continuous discharge as presented in table 2.

Table 1: Demographic features of the study participants

Features	N (%)
Gender	
Male	42(40.3%)
Female	62 (59.6%)
Age in years	
Less than 20 years	11(10.5%)
21-30	51(49.0%)
31-40	23(22.1%)
41-50	14(13.4%)
51-55	5 (4.8%)
Total	104

Table 2: Percentage of graft taken

PS flap-free myringoplasty	With a PS flap, myringoplasty
32 out off 42	51 out of 62
76.1%	82.2%
Total	104(100%)

DISCUSSION

Myringoplasty is a type of surgery used to repair a ruptured tympanic membrane and restore middle ear structure and function. In 1640, Banzer published the first description of tympanic membrane restoration. He used a pig's bladder that had been stretched on an invory tube and transplanted onto an ear.[18] Later, Brthold used an original skin graft to patch the opening in the tympanic membrane. He gave this technique the term "myringoplastik.[11] Wullstin wrote a paper outlining a skin graft technique for perforation closure.[19] Later on, Zollner also released his article on perforation correction. However, House and Wullstein came up with the concept of choosing the skin transplant from the auricular area. Following that, tympanoplasty was categorised by Wullstein and Zollner.[20] In a retrospective analysis, Wang found that the overlay approach had a 82.1 percent success rate, while the underlay process had an eighty-five percent success rate.[21] The development of advanced microsurgeries and the identification of various antibiotics gave two surgeons, Zollnir and Wullstin, an opportunity to develop novel myringoplasty procedures.[22] Since then, many surgical methods have been created in an attempt to enhance tympanoplasty results even further. The following are some of these several methods: micro-clip tympanoplasty, crowncork, tympanoplasty, laser-assisted tympanoplasty (also known as "spot welding" tympanoplasty), swinging door technique, and face pegging tympanoplasty.[23-29] Participants in our research had to be at least 15 years old and no older than 55. This is consistent with a previous research in which participants ranged in age from eighteen to forty years old.[15] Any age can have TM perforation, however younger people are more likely to have it since upper respiratory tract infections are more frequent in this age group. The present study explored the success rate of individuals who received the PS flap was 82.2%, whereas the success rate for participants who did not receive the PS flap was 76.1%.our study findings are similar to the study conducted by Dyle et al. they reported success rate 80 in ps flap and 72 without PS flap.[23] Regarding underlay tympanoplasty, the recurrence rate was 17% in the first year and 12% in the following three years, in contrast to overlay method[30] Another research found that the overlay approach had a 91% success rate, while the underlay technique had a 96% success rate.[31] The overlay approach used by Shee and Andersn showed a 97% success rate.[32] In another research, Rezer evaluated 551 instances and found that the overlay approach had a 95.6 percent success rate, while the underlay technique had a 88 percent success rate.[33] According to other research, the case collection of revision tympanoplast had a success rate of almost 59%. Although the graft underlay approach has been published, it is rarely assessed.[34-37] In India, Feroze et al.'s study revealed a 78.3% success rate for females and a 93.3% success rate for males. He concluded that this result was related to females' inability to maintain auricular cleanliness because of the lengthy hairs present.[38] We reported the proportion of male to female patients in our study, however our study's limitations is that we did not connect gender with myringoplasty outcome. Feroze et al. found that the successful outcome rate for myringoplasty participants under the age of 20 was 80%, while the success rate for patients above the age of 20 but under 46 was 88.1% of this research examined the relationship between age and myringoplasty result. The success rate with individuals older than 45 was 77.7%.[38] These findings support the outcomes of our study. However, a study found that the surgical outcome was unaffected by the patient's age, size, location, or method. myringoplasty is often a safe surgical treatment. It doesn't result in any deadly side effects. Late-onset cholesteatoma development and hearing impairments are uncommon complications. [6]Similar findings were made by Lee et al. when comparing the results of small and large perforations. They found that the first type had a higher success rate (74.1%) than the latter (56.0%).[39]

CONCLUSION

The current study concluded that a posterior superior based flap in a subtotal perforation increases the blood flow to the graft center, improving the graft absorption rate and raising the success rate.

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