Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20194950

Traumatic perforations of tympanic membrane: a study of sixty patients

Anchal Gupta*, Padam Singh Jamwal

Department of Otorhinolaryngology and Head and Neck Surgery, SMGS Hospital, Government Medical College, Jammu, Jammu and Kashmir, India

Received: 02 October 2019 Revised: 16 October 2019 Accepted: 17 October 2019

*Correspondence: Dr. Anchal Gupta,

E-mail: anchalsachit@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Traumatic perforation of the tympanic membrane can lead to hearing loss. This study was undertaken to study the etiology of traumatic tympanic membrane perforations.

Methods: This hospital based retrospective observational study was conducted in the department of ENT, SMGS Hospital, Jammu from January 2018 to January 2019. A detailed clinical and otoscopic examination was done and symptoms noted. Tuning fork tests and pure tone audiometry was done in all the patients. Tympanic membrane perforations were visualized using otoscope or examination under microscope was done. A conservative management approach was adopted, except for those with bloody or watery discharge who received oral/systemic antibiotics to prevent infections.

Results: 60 patients were included in the study. Maximum patients were in the age group of 21-40 years accounting for 56.7% patients. The male to female ratio was 1.4:1. The most common complaint was tinnitus (90%), followed by pain in ear (81.6%), hearing loss (56.7%), aural fullness (45%), ear bleed (16.7%) and vertigo (5%). The most common etiology was physical assault by slaps and blows to ear (40%), followed by instrumentation (syringing and foreign body removal). In 40 (66.67%), left ear was involved whereas in 20 (33.33%) right ear was involved. 51 (85%) patients showed spontaneous healing within 3 months whereas 9 (15%) showed no healing and these 15% patients underwent tympanoplasty at the end of 3 months.

Conclusions: Traumatic tympanic membrane perforations have a very good prognosis if they are treated at a right time.

Keywords: Assault, Perforation, Trauma

INTRODUCTION

Traumatic perforation of the tympanic membrane is an injury of the eardrum, which is frequently faced by otolaryngologists. The tympanic membrane is a delicate translucent fibrous membrane that separates the external from middle ear. It is much more traumatized than middle ear or inner ear. Traumatic perforation of the tympanic membrane can result from blunt or penetrating injuries. Blasts, slaps, rapid airplane descent or deep water diving

can create a column of compressed air within the external auditory canal that can implode the tympanic membrane. Penetrating injuries are mostly self inflicted but may also be due to procedures like removal of wax or foreign bodies.²

Ear buzzing, ear ache and hearing loss are the major symptoms of tympanic membrane perforation. In severe cases there may be bleeding from ear and vertigo.³ It can also the risk of middle ear infection or otitis media.⁴ In

most studies, spontaneous healing of tympanic membrane occurs in about 80% of cases within 3 months of injury. Thus masterly inactivity is the standard mode of treatment for first 3 months.⁵

This study aims to evaluate the presenting symptoms of patients with tympanic membrane perforation and to study the etiological factors responsible for traumatic tympanic membrane perforations.

METHODS

This hospital based retrospective observational study was conducted in the department of ENT, SMGS Hospital, Jammu from January 2018 to January 2019.

Inclusion criteria

Traumatic perforation of the tympanic membrane irrespective of time of presentation.

Exclusion criteria

Patients with history of previous ear discharge or impaired hearing, ear surgery or chronic otitis media in the same ear and patients who were lost to follow up.

A detailed clinical and otoscopic examination was done and symptoms noted. Tuning fork tests and pure tone audiometry was done in all the patients. Patients were followed up weekly for 1 month and then fortnightly till 3 months. The data collected included following parameters: sex, age and site, cause of injury. Symptoms like: earache, hearing loss, tinnitus, vertigo. Tympanic membrane perforations were visualized using otoscope or Examination under microscope was done. A conservative management approach was adopted, except for those with bloody or watery discharge who received oral/systemic antibiotics to prevent infections. The patients were advised not to wet the ears and report immediately if discharge appeared.

Statistical analysis

Data was entered in Microsoft excel and analysis was done using SPSS version 20. Descriptive statistical analysis was done. Results on categorical measurements are presented as percentages.

RESULTS

60 patients were included in the present study. The observations and results are as follows.

Age and sex distribution

The youngest patient was 3 years old and oldest was 70 years old. The mean age was 25 ± 3 years. Age wise wise distribution is shown in Figure 1. There were 35 males and 25 females. The male to female ratio was 1.4:1. The frequently affected age group in males was 31-40 years whereas in females it was 21-30 years. Maximum patients were in the age group of 21-40 years accounting for 56.7% patients.

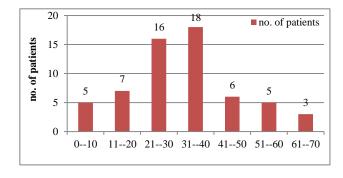


Figure 1: Age wise distribution of patients (in years).

Chief complaints

In the present study, the most common complaint was tinnitus (90%), followed by pain in ear (81.6%), hearing loss (56.7%), aural fullness (45%), ear bleed (16.7%) and vertigo (5%) (Figure 2).

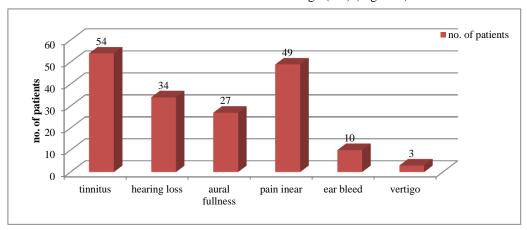


Figure 2: Distribution of cases according to presenting complaints.

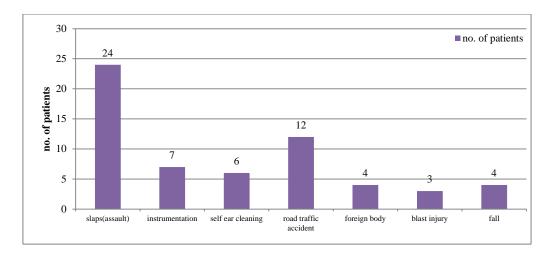


Figure 3: Distribution of patients according to etiology.

Distribution of patients according to etiology

Out of 60 cases, the most common etiology causing tympanic membrane perforation was that cause by physical assault by slaps and blows to ear (40%), followed by instrumentation (syringing and foreign body removal) (11.67%), self-ear cleaning by ear buds and pointed objects (10%), road traffic accidents (20%), foreign body of the ear (6.67%), blast injuries (5%) and falls from height (6.67%) (Figure 3).

Laterality

In 40 (66.67%), left ear was involved whereas in 20 (33.33%) right ear was involved.

Outcome

In our study, 50% patients had spontaneous healing of the tympanic membrane perforation between 1-4 weeks, 28.33% showed healing within 4-8 weeks and 6.67% had healing between 8-12 weeks (Figure 4). In total 51 (85%) patients showed spontaneous healing within 3 months whereas 9 (15%) showed no healing of tympanic membrane perforation and these 15% patients underwent tympanoplasty at the end of 3 months (Figure 5).

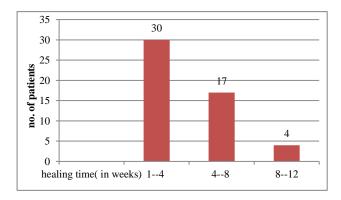


Figure 4: distribution of patients according to healing time.

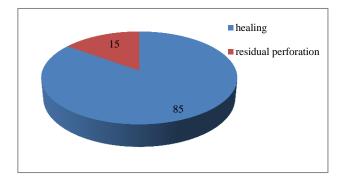


Figure 5: Outcome.

DISCUSSION

Trauma with its manifold manifestations is on an exponential rise in India given the diversity of political, cultural and social interests of its millions. This could be in the form of assault, road traffic injury, domestic violence, industrial and sports injury. Trauma to the ear can range from simple to complex cases like blunt trauma, laceration, or avulsion of part or all of the pinna; uncomplicated tympanic membrane perforation; dislocation of ossicles; and longitudinal and transverse fractures of petrous temporal bone with associated loss of inner ear and facial nerve function. ^{6,7}

The youngest patient was 3 years old and oldest was 70 years old. The mean age was 25±3 years. The frequently affected age group in males was 31-40 years whereas in females it was 21-30 years. Maximum patients were in the age group of 21-40 years accounting for

56.7% patients. These findings are similar to studies by Gacek and Gacek and Berger et al. ^{8,9} There were 35 males and 25 females. The male to female ratio was 1.4:1. This findings coincide with the studies by Gacek and Gacek, da Lilly-Tariah and Somefun. ⁸⁻¹⁰

In the present study, the most common complaint was tinnitus (90%), followed by pain in ear (81.6%), hearing

loss (56.7%), aural fullness (45%), ear bleed (16.7%) and vertigo (5%). In the study by Berger et al and da Lilly-Tariah and Somefun hearing loss followed by tinnitus and otalgia were common complaints. ^{9,10}

Out of 60 cases, the most common etiology causing tympanic membrane perforation was that cause by physical assault by slaps and blows to ear (40%), followed by instrumentation (syringing and foreign body removal) (11.67%), self-ear cleaning by ear buds and pointed objects (10%), road traffic accidents (20%), foreign body of the ear (6.67%), blast injuries (5%) and falls from height (6.67%). In 40 (66.67%), left ear was involved whereas in 20 (33.33%) right ear was involved.

These findings could be related to the fact that most common mode of injury was assaults mostly slaps and since most assailants are right handed and slaps occur with the victim and assailant facing each other making the left ear more prone to trauma. Lindeman et al and Berger et al, in their studies reported a similar predilection for left ear. 9,11

Attempts at removal of foreign bodies from external auditory canal, self-ear cleaning and wax removal in an unskilled manner are other important causes of trauma as reported in various studies by da Lilly- Tariah and Somefun, Lindeman et al, Ijaduola and Okeowo, Ahmad and Ramani. 10-13

In our study, 50% patients had spontaneous healing of the tympanic membrane perforation between 1-4 weeks, 28.33% showed healing within 4-8 weeks and 6.67% had healing between 8-12 weeks . In total 51 (85%) patients showed spontaneous healing within 3 months whereas 9 (15%) showed no healing of tympanic membrane perforation and these 15% patients underwent tympanoplasty at the end of 3 months. These findings are shown in studies by Sarojamma et al, Jellinge et al, Ologe et al, Gacek and Gacek. $^{4\text{-}6,8}$

CONCLUSION

Since traumatic tympanic membrane perforations are more likely to heal spontaneously, wait and watch policy with water precautions to the patients remains the mainstay of the treatment.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- Golam Rabbani SM, Rashid A, Mahmud K, Chowdhury MA, Razzak A. Traumatic rupture of tympanic membrane: A study of 70 cases. Bangladesh J Otorhinolaryngol. 2015;21(1):38-42.
- 2. Ott MC, Lundy LB. Tympanic membrane perforation in adults. How to manage, when to refer. Postgrad Med. 2001;110:81-4.
- 3. Orji FT. Non explosive blast injury of the tympanic membrane in Umuahia, Nigeria. Niger J Med. 2009;18(4):365-9.
- 4. Sarojamma, Saurabh R, Satish HS. A clinical study of traumatic perforation of tympanic membrane. IOSR J Dental Med Sci. 2014;13(4):24-8.
- 5. Jellinge ME, Kristensen S, Larsen K. Spontaneous closure of traumatic tympanic membrane perforations: observational study. J Laryngol Otol. 2015;129:950-4.
- 6. Ologe FE. Traumatic perforation of tympanic membrane in Ilorin, Nigeria. Nig J Surg. 2002;8(1):9-12.
- 7. Toner JG, Kerr AG. Ear Trauma. In: Booth JB, Kerr AG, Groves J (eds). Scott-Brown's Otolaryngology. London: Butterworth Heinemann; 1997: 3/711-3/713.
- 8. Gacek RR, Gacek MR. Anatomy of the auditory and vestibular systems. In: Snow JB, Ballenger JJ (eds). Ballenger's Otorhinolaryngology Head and Neck Surgery. 16th edition. Volume 1. ONtorio: DC Becker Inc.; 2003: 1-5.
- 9. Berger G, Finkelstein Y, Harell M. Non explosive blast injury to the ear. J Laryngol Otol. 1994;108:395-8.
- 10. da Lilly-Tariah OB, Somefun AO. Traumatic perforation of the tympanic membrane in University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria. Niger Postgrad Med J Surg. 2002;8:9-12.
- Lindeman P, Edstrom S, Granstrom G, Jacobbson S, von Sydow C, Westin T, et al. Acute traumatic tympanic membrane perforations. Cover or observe? Arch Otolaryngol Head Neck Surg. 1987;113:1285-7.
- 12. Ijaduola GT, Okeowo PA. Foreign body in the ear and its importance: The Nigerian experience. J Trop Pediatr. 1986;32:4-6.
- 13. Ahmad SW, Ramani GV. Hearing loss in oerforations of tympanic membrane. J Laryngol Otol. 1979;93:1091-8.

Cite this article as: Gupta A, Jamwal PS. Traumatic perforations of tympanic membrane: a study of sixty patients. Int J Otorhinolaryngol Head Neck Surg 2019;5:1684-7.