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ORIGINAL RESEARCH

Assessment of cases of traumatic tympanic membrane perforation

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Abstract
Background: Traumatic tympanic membrane (TM) perforation is an injury of the eardrum, which is frequently encountered by otolaryngologists. The present study was conducted to assess the cases of traumatic tympanic membrane perforation (TTMP).
Materials & Methods:136 cases of traumatic tympanic membrane perforation of both genders were recorded. Parameters such as size, site, complaint and mechanism of injury was recorded.
Results: Side involved was left in 80, right in 56. Site was anterior in 50, posterior in 60 and undefined in 26. Complaints was otalgia in 48, tinnitus in 60, otorrhoea in 30 and vertigo in 104. The mechanism of injury was domestic violence in 32%, RTA in 54%, armed robbery in 8% and self- inflicted in 6%. The difference was significant (P< 0.05).
Conclusion: Common side involved in traumatic tympanic membrane perforation was left, site was anterior, posterior and undefined. Complaints was otalgia, tinnitus, otorrhoea and vertigo.
Key words: tympanic membrane, otolaryngologists, perforation

Introduction

Trauma remains a regular occurrence relating to activities and lifestyle of humans and it can affect any part of the body.[1] The ear is located within the cranio-facial skeleton which is exposed to environmental trauma that can occur as blunt injuries like contusion, concussion, decompression, and penetrating injuries as fractures.[2] Major injuries affecting the ears can lead to disturbances in hearing and difficulties in maintenance of balance especially when the inner ear is affected. More of ear trauma however affect either the bony skeleton or soft tissue structures within the external and middle ear. Ear injuries may lead to lacerations in the external ear, and disruption of the ossicular chain in the middle ear cavity.[3]

Traumatic tympanic membrane (TM) perforation is an injury of the eardrum, which is frequently encountered by otolaryngologists. Common causes to traumatic TM perforation include rapid change in eatemprr pressure (eg, occurring when flying and scuba diving), thermal or chemical burns, direct penetrating trauma, and barotrauma.[4,5] The incidence of perforations of the TM due to trauma is on the increase consequent to trauma, and increased violence and accidents seen in present-day life.[6] Ear buzzing, earache, and hearing loss are

the major symptoms of TM perforation. In addition, TM perforation can increase the risk for middle ear infection or otitis media. Although most small perforations of the eardrum can be spontaneously healed, large TM perforations should be treated with myringoplasty.[7,8]The present study was conducted to assess the cases of traumatic tympanic membrane perforation (TTMP).

Materials & Methods

The present study comprised of 136cases of traumatic tympanic membrane perforation of both genders. All were informed regarding the study and their written consent was obtained. Data such as name, age, gender etc. was recorded. A thorough ear examination was carried by an expert ENT surgeon. Parameters such as size, site, complaint and mechanism of injury was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 136		
Gender	Male	Female
Number	88	48

Table I shows that out of 136 patients, there were 88 males and 48 females.

Table II Demographic characteristics

Parameters	**Variables**	**Number**	**P value**
Side	Left	80	0.02
	Right	56	
Site	Anterior	50	0.05
	Posterior	60	
	Undefined	26	
Complaint	Otalgia	48	0.05
	Tinnitus	60	
	Otorrhoea	30	
	Vertigo	104	

Table II, shows that side involved was left in 80, right in 56. Site was anterior in 50, posterior in 60 and undefined in 26. Complaints was otalgia in 48, tinnitus in 60, otorrhoea in 30 and vertigo in 104. The difference was significant (P< 0.05).

Table III Mechanism of injury

Injury	**Percentage**	**P value**
Domestic violence	32%	0.01
RTA	54%	
Armed robbery	8%	
Self- inflicted	6%	

Table III, graph I shows that mechanism of injury was domestic violence in 32%, RTA in 54%, armed robbery in 8% and self- inflicted in 6%. The difference was significant (P< 0.05).

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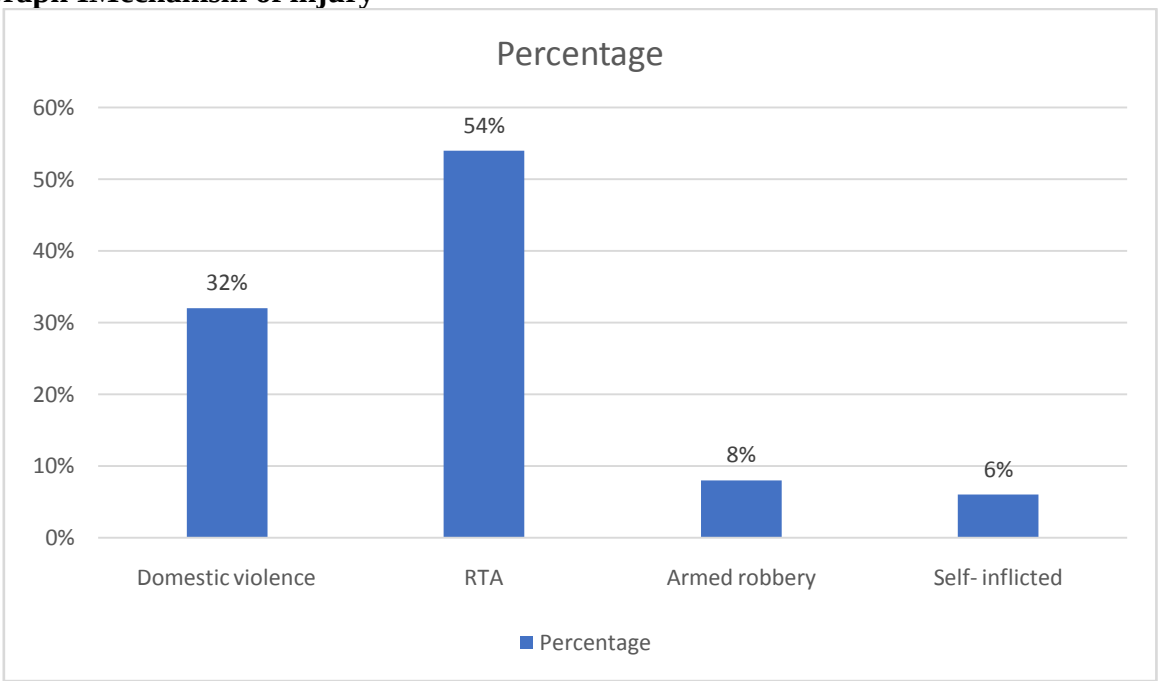
Graph IMechanism of injury



Discussion

The audiological outcome of the tympanoplasty amounts to 80%–90%, and a good result is considered if improvement of the air-bone gap amount 15 dB or more.[8,9] The audiological outcome depends on the condition of the middle ear, the presence or absence of the cholesteatoma and depends also on the condition of the ossicular chain and the degree of the aeration of the middle ear.[10] Since all of these factors can impact the audiological outcome, there are various techniques used to improve the surgical procedure, primarily in terms of the material used to close the eardrum defect. Materials for the closure of the defect can be autologous, which include temporalis fascia, fascia lata, perichondrium, cartilage with or without perichondrium, veins, fat, and skin.[11] The present study was conducted to assess the cases of traumatic tympanic membrane perforation (TTMP).

We found that out of 156 patients, there were 88 males and 48 females. Sogebiet al[12] found that there were 53 patients, Male: Female ratio =1.5:1, age 8–71years (Mean ±SD= 33.8 ±12.9). Median duration of injury before presentation was 3 days. 11 patients had both ears traumatized. 46.9% of perforations were in the antero-inferior part of the TM. Median size of perforations was 33.0%; Patients main complaints were blockage of the ears/ hearing loss and tinnitus. Common causes of perforations were domestic assault (28.3%), self-inflicted/ accidental injuries (20.8%), and road traffic accidents (18.9%). There was a significant difference in the mechanism/cause of injuries between the sexes (X2 =15.607, p=0.005). Traumatic perforation was caused by penetrating injuries in 22 (34.4%) ears. The outcome of TTMP was poor in 18.7%. Big sized perforations, penetrating injuries (X2 =9.263; p=0.005), and postero-superior location had negative impacts on the healing. TTMP was common in young adult males, caused often by assaults, presented with ear hearing loss and tinnitus, perforations were located in antero-inferior part of TM and most healed well. Factors associated with poor healing were postero-superior location, large size and penetrating injuries to the TM.

We observed that side involved was left in 80, right in 56. Site was anterior in 50, posterior in 60 and undefined in 26. Complaints was otalgia in 48, tinnitus in 60, otorrhoea in 30 and vertigo in 104. Hodzic-Redzicet al[13] included 243 patients operated for tympanoplasty. Tympanoplasty was done under general anesthesia. The retroauricular approach was

primarily used. All grafts were placed using the underlay technique. Audiological testing of all patients was done preoperatively and postoperatively. The temporal fascia was used as the graft material in 160 patients, and tragal perichondrium was used in 83 patients. Improvement of audiological outcome in patients with temporal fascia amounted 62.5% and in patients with perichondrium amounted 60.24%. The graft success rate 3 months postoperatively was 92.5% in the fascia group whereas it was 95.18% in the perichondrium group

We found that mechanism of injury was domestic violence in 32%, RTA in 54%, armed robbery in 8% and self- inflicted in 6%.Lou et al[14] reported that aural slap was responsible for more than half of cases of TTMP in their study.

Conclusion

In our study we concluded that common side involved in traumatic tympanic membrane perforation was left, site was anterior, posterior and undefined. Complaints wereotalgia, tinnitus, otorrhoea and vertigo.

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