



CLINICAL PROFILE OF PATIENTS WITH TRAUMATIC TYMPANIC MEMBRANE PERFORATION IN GMC RAJOURI AND AH

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ABSTRACT

Background: Traumatic tympanic membrane perforation is commonly encountered in ent department (both in opd and emergency). It can result from blunt or penetrating injuries. Expectant management is to wait for spontanous healing.

Aims and objectives: To determine age, sex, time of presentation, predominant side, laterality, etiology, presenting complaints, size of perforation, no. of perforations, hearing loss and outcome after 3 months.

Material and method: The study was conducted on 50 patients in ENT department of GMC rajouri and AH over a period of one year from December 2019 to January 2021.

Results: A total of 50 patients with traumatic tympanic membrane perforation was enrolled for this study. It affects all age groups with highest incidence in 3rd and 4th decade. The study group consisted of 32 (64%) males and 18 (36%) females. 22 (44%) patients reported with in 24-72 hours, 12 (24%) with in 72 hrs-1 week, 10 (20%) with in <24 hours and 6 (12%) with in >1-2 week. Right ear was involved in 21 (42%) and left ear in 29 (58%) patients. 48 (96%) patients had unilateral and only 2 (4%) with bilateral involvement. Type of trauma included physical assault and slap in 29 (58%), road traffic accident in 11 (22%), iatrogenic in 5 (10%), syringing in 3 (6%), lightning in 1 (2%) and ear bud injury in 1 (2%) patient. Ear blockade in 36 (72%) patients was the most common complaint followed by pain in 23 (46%),hearing loss in 13 (26%), bleeding in 12 (24%), vertigo in 3 (6%) and tinnitus in 3(6%) patients. 28 (56%) patients had grade 1(<25%) perforation followed by grade 2 (>25-50%) in 20 (40%) and grade 3 (>50%) in 2 (4%) patients. 29 (58%) patients presented with <20 db of hearing loss, 17 (34%) with 21-35db and 4 (8%) with >35db. After 3 months, 44 (88%) patients perforation healed spontanously, 4 (8%) had dry residual perforation and perforation with discharge in 2 (4%) patients.

Conclusion: In our experience, traumatic tympanic membrane perforation is still common in daily ent practice. Physical assault , slap, road traffic accidents, lightning, instrumentation are common etiologies seen. It affects all ages. Ear blockade, pain and hearing loss are commonest symptoms. The masterly inactivity should be seriously followed and unnecessary surgical intervention should be discouraged.

KEYWORDS : tympanic membrane perforation, trauma to ear, Rajouri.

INTRODUCTION

Tympanic membrane is a obliquely set thin wall structure that forms the partition between external acoustic canal and the middle or inner ear. Traumatic tympanic membrane perforation is commonly encountered in daily ent opd and emergency. Traumatic perforation result from blunt or penetrating injuries. Sudden change in air pressure forexample slap or kiss on ear or sudden blast may cause perforation. Forceful valsalva may rupture a thin atrophic membrane. Pressure by a fluid column during diving or water sports or forceful syringing may cause perforation. Fracture of temporal bone may lead to perforation. The incidence of traumatic perforation of tympanic membrane is on rise, consequent to increase violence and accidents seen in the present day life (6). Predisposing factors lead to perforation include previous disease or injury, increased age, inadequate pneumatization and tympanic membrane position perpendicular to incident wave, increase likelihood of perforation. The symptoms of tympanic membrane perforation is pain, bleeding, ear blockade, hearing loss, vertigo, tinnitus etc.

Most studies suggested that up to 80 -90% of perforations heal spontanously with in 3 months (3). Masterly inactivity is the standard mode of treatment for the first 3 months. But in doing so, patients are unnecessarily exposed to disabling symptoms and the need to modify lifestyle for those 3 months(7).

MATERIAL AND METHOD:

The study was carried out in the department of ENT and head neck surgery of GMC Rajouri and AH, a tertiary care hospital over a period of one year from December 2019 to January 2021. Patients with history of trauma in form of assault, iatrogenic, syringing, lightening, road traffic accident etc with no previous ear disease were included in the study. A detailed history, clinical and otoscopic examination were performed and associated symptoms like pain, bleeding, ear blockade, decreased hearing, tinnitus, vertigo were noted. Tuning fork test and pure tone audiometry was performed on all patients. Data retrieved includes age, sex, side, etiology, laterality presenting complaints, time of presentation , size of perforation ,number of perforation, hearing loss, outcome at 3 months. The tympanic membrane was assessed by otoscope /otoendoscope /microscope. Pure tone audiometry were determined for air and bone conduction at 250, 500, 1000, 2000 and 4000hz. A conservative approach was adopted in all patients with prophylactic use of oral antibiotics, analgesic and decongestant to prevent secondary infection. Patients were advised to avoid strict entry of water or any ear drop to affected ear.

OBSERVATIONS

A total of 50 patients with traumatic tympanic membrane perforation were enrolled in the study.

Table 1: Sex distribution in patients with TMP

Sex of patient	No. of patients
Male	32 (64%)

Female	18 (36%)
Total	50

The group consisted of 32 males and 18 females.

Table 2: Age distribution in patients with TMP

Age of patient (in years)	No. of patients
0-1	5 (10%)
11-20	5 (10%)
21-30	22 (44%)
31-40	11 (22%)
41-50	4 (8%)
51-60	3 (6%)
Total	50

The age ranged from 6 to 60 years. In this series, 33 (66%) of the patients were in the age group of 21-40 years. The youngest patient was a 6 year old boy who sustained traumatic perforation of tympanic membrane during forigen body removal.

Table 3: Time of presentation of patients with TMP

Time of reporting	No. of patients
< 24 hrs	10 (20%)
>24 – 72 hrs	22 (44%)
>72 hrs – 1 week	12 (24%)
>1 – 2 week	6 (12%)
Total	50

In our study, 44 (88%) patients reported with in one week of perforation.

Table 4: Side involvement in patients with TMP

Side affected	No. of patients
Right	21 (42%)
Left	29 (58%)
Total	50

The right ear was involved in 21 (42%) patients, the left ear in 29 (58%) patients.

Table 5: Laterality of patients with TMP

Laterality	No. of patients
Unilateral	48 (96%)
Bilateral	2 (4%)
Total	50

48 (96%) patients had unilateral involvement and only 2 (4%) patients with bilateral perforation.

Picture 1: Showing tympanic membrane perforations.

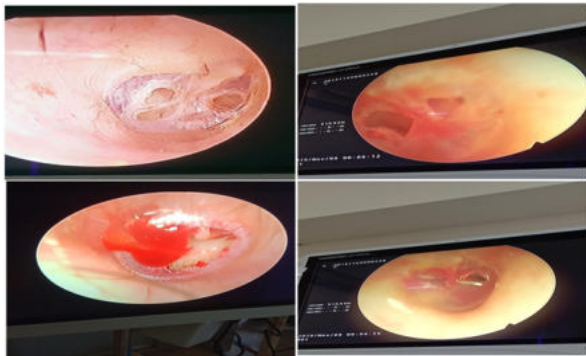


Table 6: Etiology of patients with TMP

Mode of injury	No. of patients
Physical assault/slap	29 (58%)
Blunt trauma/ road traffic accident	11 (22%)
Iatrogenic	5 (10%)
Syringing	3 (6%)
Lightning	1 (2%)

Ear bud injury	1 (2%)
Total	50

Picture 2: Showing bilateral multiple tympanic membrane perforations because of lightning.



In our study, the most common etiology of traumatic perforation of tympanic membrane was injury caused due to physical assault /slap (58%). Blunt trauma and road traffic accident accounted for 22%, iatrogenic (during forigen body removal) accounted for 10%, syringing for 6%, ear bud injury for 2% and perforation due to lightning accounted for 2%.

Table 7: Presenting complaints of patients with TMP

Complaint of patient	No. of patients
Pain	23 (46%)
Bleeding	12 (24%)
Ear blockade/aural fullness	36 (72%)
Decreased hearing	13 (26%)
Vertigo	3 (6%)
Tinnitus	3 (6%)

In our study, ear blockade was the most common complaint (72%), the next common complaint was pain (46%) followed by decreased hearing (26%), bleeding (24%), vertigo (6%) and tinnitus (6%).

Table 8: Size of perforation in patients with TMP

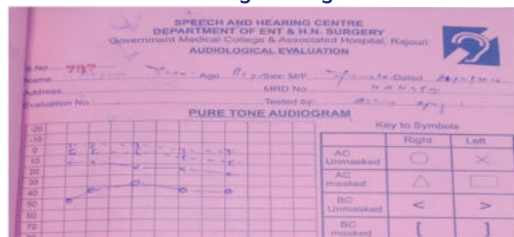
Grading of perforation	No. of patients
Grade 1 (<25%)	28 (56%)
Grade 2 (25-50%)	20 (40%)
Grade 3 (>50%)	2 (4%)
Total	50

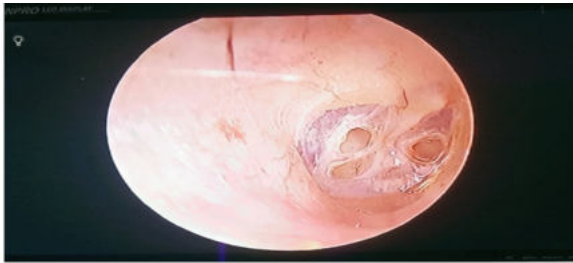
In our study, of the 50 patients, 28 (56%) had grade 1 perforation involving <25% of the tympanic membrane, 20 (40%) patients had larger grade 2 perforation involving 25-50% of the ear drum and 2 (4%) patients had grade 3 perforation involving more than 50% of the tympanic membrane.

Table 9: Number of perforations in tympanic membrane

No. of perforations	No. of patients
Single	45 (90%)
Multiple (more than one)	5 (10%)
Total	50

Picture 3: Showing multiple perforations in tympanic membrane with PTA showing hearing loss.





In our study, 45 (90%) patients had single perforation and 5 (10%) had multiple perforation.

Table 10: Hearing loss in patients with TMP

Hearing loss in db	No. of patients
<20	29 (58%)
21-35	17 (34%)
>35	4 (8%)
Total	50

In our study, majority of the patients (58%) presented with conductive hearing loss <20db, 34% of patients with in the range of 20-50db and only 8% of patients presented with >35db loss.

Table 11 : Tympanic membrane condition after 3 months.

Outcome at 3 months	No. of patients
Healed	44 (88%)
Dry residual perforation	4 (8%)
Perforation with discharge	2 (4%)
Total	50

At the end of 3 months of perforation in our study, 44 (88%) patients with perforation healed spontaneously, 4 (8%) left with dry residual perforation and 2 (4%) with discharging perforation.

DISCUSSION

Tympanic membrane is an important component of sound conduction as its vibratory characteristic is necessary for sound transmission in human beings. Trauma to tympanic membrane can be caused by over pressure, blunt or penetrating injuries and barotraumas (4).

In our study traumatic tympanic membrane perforation were seen in all age groups ranging from 6-60 years. The incidence is highest in middle age group i.e 21 -40years which is similar to studies undertaken by Wani, Khan, Sannigrahi et al. Male to female involvement was 1.77:1.00. This result is in accordance with the study of Wani and Irfan (9,4). Khan and Sannigrahi studies shows greater prevalence among females (5,7).

In our study, 48 (96%) patients had unilateral involvement, the reason behind this unilateral involvement may be because of unilateral trauma on that side and the other side unaffected.

The right ear involvement was seen in 21 (42%) patients and left ear was involved in 29 (58%) patients. This could be because of the fact that most assailants were right handed and likely that acts of trauma like slap, or with some stick occurred with the assailants and victims facing each other making the left ear more vulnerable to trauma. Wani et al, Irfan, Khan et al, reported a similar predilection for left ear (9,4,5). Perforation occurred as a result of foreign body removal was found in 5 (10%) patients. This may be because of repeated attempts of foreign body removal either by some unskilled medical practitioner, parents or quacks. So, there is a need for the primary care physician to draw lines and consider the referral in such cases where expertise is needed.

In our study regardless of mechanism of injury, ear blockade

was the most common symptom in 36 (72%) patients. The next common symptom was pain in 23 (46%) followed by decreased hearing in 13 (26%), bleeding in 12 (24%), vertigo in 3 (6%) and tinnitus in 3 (6%) . In the study by Wani, aural fullness was the second commonest symptom followed by reduced hearing, pain, bleeding and vertigo (9).

In our study, grade 1 perforation was found in 28 patients, grade 2 in 20 and grade 3 in 2 patients which resembles with study of Khan et al where 28 patients had grade 1, 19 patients had grade 2 and only 3 patients had grade 3 perforation (5).

In our study, hearing loss increased with increase in size of perforation. It is due to hydraulic action arising from the difference in area of foot plate, the most important factor in impedance matching (1). When the surface area is decreased, there is decrease in amplification and hearing loss will be proportional to the size of perforation (2).

Most traumatic perforation have tendency to heal spontaneously , there was 88% healing in our study which is similar to other studies (4,5,9)

CONCLUSION

Traumatic tympanic membrane perforation is commonly encountered in ent practice. It is common in young males especially in 3rd decade of life. Physical assault including slap was the commonest cause of traumatic perforation affecting left ear more than right with predominantly single unilateral perforation . Ear blockade is the most common complaint of patient. Most of the patients reported with in one week of perforation. Majority of the patients presented with grade 1 perforation and conductive hearing loss <20db. At 3 months after perforation, almost 90% healed spontaneously. There is a need for the primary care physician to draw the red lines and routinely consider the referral in cases where there is difficult foreign body ear. Self ear cleaning with variety of objects and wax removal in unskilled manner either by parents, quacks should be discouraged. Expectant management is to wait for spontaneous healing, which usually occurs in almost all cases in a few week time.

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