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CLINICAL STUDY OF FACTORS AFFECTING HEALING OF POST-TRAUMATIC TYMPANIC MEMBRANE PERFORATION IN A TEACHING HOSPITAL

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ABSTRACT Tympanic membrane perforation is common after a direct or indirect trauma. Its healing depends on several factors. 48 patients with post traumatic tympanic membrane perforations were included in the study from April 2014 to March 2017. Healing was faster in case of young patients with small perforations with no history of any wrong intervention or presence of infection. Most tympanic membrane perforations healed spontaneously especially the smaller ones and in young patients with minimal hearing loss. Failure to heal was mainly due to loss of tissues and secondary infection.

KEYWORDS : Post-traumatic, Tympanic membrane, Perforation

INTRODUCTION

Tympanic membrane (TM) perforation due to trauma has been found to be common in India. Lack of awareness, poor hygiene, increasing domestic violence and road traffic accidents are contributory factors in TM perforations. Traumatic perforation of TM is caused by a direct penetrating injury like insertion of cotton tipped applicator (ear buds), hairpin, matchstick or by indirect trauma like explosion, violent blow with cupped hand, diving, barotraumas and temporal bone fracture. Abrupt change in air pressure in external auditory canal due to violent blow or slap on ear is commonly responsible for rupture of TM. Usually a positive pressure of 25 pounds per square inch is required to rupture the TM [1]. Several factors, such as age, size and site of perforation, ear discharge, and wrong intervention affect the healing process. Conservative management results in spontaneous healing of most of the cases of TM perforations, with alleviation of symptoms [2].

OBJECTIVE

The present study intends to assess the various factors, which determine spontaneous healing of post-traumatic perforations of TM.

MATERIALS & METHODS

48 patients with TM perforations following trauma without history of any previous middle ear disease, who attended the E.N.T. department of IMS & SUM Hospital, Bhubaneswar during the period from April 2014 to March 2017 were included in the present study. After thorough history taking, all the patients were subjected to otoscopic examination and hearing evaluation. All the patients were given a course of systemic antibiotics, along with an advice to prevent entry of water into the ear and follow up was done at 4, 8, and 12 weeks interval.

OBSERVATION

Table-1: Age & sex distribution of patients with post-traumatic TM perforations

Age (years)	Male	Female	Total (%)
6-10	1	1	2(4.2%)
11-20	2	2	4(8.3%)
21-30	12	16	28(58.3%)
31-40	3	6	9(18.8%)
41-50	2	2	4(8.3%)
51-60	0	1	1(2.1%)
Total	20	28	48(100%)

Table-2: Causes of post-traumatic TM perforations

Aetiological factors		No. of patients	Percentage
Direct trauma		15	31.2
Indirect trauma	Slap	21	43.8
	Explosives	5	10.4
	Diving	1	2.1
	Barotraumas	2	4.2
	Temporal bone fracture	4	8.3
Total		48	100

Table-3: Prevalence of spontaneous healing of TM after 12 weeks of perforation

Character	Healed TM (38 cases)	Non-healed TM (10 cases)
Age (years)		
Less than 20	9	1
21-40	23	4
More than 40	6	5
Sex		
Male	16	4
Female	22	6
Hearing loss		
Mild(20-30dB)	30	7
Mod(31-50dB)	8	3
Laterality		
Left	26	5
Right	12	5
Size		
Grade-I (<25% TM involved)	31	1
Grade-II (25-50%)	5	2
Grade-III (>50%)	2	7
Causes		
Direct injury	18	6
Indirect injury	20	4

Post-traumatic TM perforation was found to be most common in young patients i.e. 21-30 years of age (58.3%). In the present study no. of perforations in TM was more in females than in males in the ratio 1.4:1 (Table-1). TM perforations due to direct trauma were encountered in 15 patients (31.2%), whereas those due to indirect trauma were seen in 33 patients (68.7%). Among the indirect trauma group, slap injury (43.7%) was the commonest causative factor (Table-2). Patients in age group of 21-40 years (47.9%), patients with mild hearing loss (62.5%) and patients with perforations of small size (64.5%) showed healing of the perforation spontaneously after 12 weeks (Table-3).

DISCUSSION

As per the present study, young patients showed greater potential for spontaneous healing of perforated TM and recovery, which was in consistence with that of a previous study [3]. The smaller perforations of TM healed spontaneously more in comparison to larger ones [4]. Those with mild hearing loss had a greater chance for spontaneous recovery with good prognosis [5]. Gender, laterality

and aetiological factors had no significant effect on the healing process. As per a study, wrong intervention, loss of tissue and secondary infection were the factors that predisposed to failure of the TM perforations to heal [6]. This finding is similar to the results of the present study, which revealed that, patients in age group of 21-40 years, patients with mild hearing loss and with perforations of small size showed healing of the TM perforations spontaneously after 12 weeks.

CONCLUSION

TM perforation due to trauma is a commonly encountered condition, which is caused by both direct penetrating injury and indirect trauma. Slap injury has been a common indirect traumatic cause, which is frequently encountered in females possibly due to an increase in domestic violence. Small perforations, young age, strict avoidance of entry of water into ear, no unnecessary manipulation and regular follow up are key factors resulting in spontaneous healing of post-traumatic TM perforations.

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