ORIGINAL ARTICLE

A CLINICAL STUDY ON EAR TRAUMA IN SOUTH INDIA

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ABSTRACT

Aim: To review about the presentations, types and aetiology of factors affecting ear trauma in patients of Konaseema region of Andhra Pradesh in South India and recommend appropriate management.

Materials and Methods: All patients treated for ear trauma at Konaseema Institute of Medical Sciences & Research Foundation of Andhra Pradesh in South India for a period of one year from 1st January 2015 to 31st December 2015 were studied using their clinical records after obtaining ethical committee clearence. Data extracted were analysed by using SPSS software.

Results: The results were presented in simple descriptive and tabular forms. Total 43 patients, out of which, 37(84%) males and 6(16%) females, of ages 10 to 70 years, average age of 33.41 years were studied. Road traffic accidents RTA 35(81.39%) was the commonest aetiology while bleeding from the ear 26(60.46%), tympanic membrane perforation 25 (58.13%), Ear laceration 12(27.90%) and ear contusion haematomas 5(11.62%) were other frequent presentations.

Discussion: In ear trauma tympanic membrane is mostly affected. Sudden increase in canal pressure from trauma by Road traffic accidents or blows/slaps were the major mechanism of injury.

Conclusion: Early Management of all ear trauma cases was good except for few late presenters with complications.

Keywords: Ear, RTA, Trauma, Aetiology, Presentation

INTRODUCTION

Ear trauma is a reflection of increasing number of road and other accidents, physical assaults, contact sports and other forms of trauma. The external, middle and inner ear may be affected in isolation or together depending on the force and agent of trauma. The lesions may range from simple blunt trauma to the pinna, without loss of tissue, through uncomplicated rupture of the tympanic membrane to transverse fracture of the petrous temporal bone with complete loss of inner ear and facial nerve function. Outside the nose the auricle occupies the most prominent position in the face. Its exposed and unprotected position makes it susceptible to injuries. Lesions encountered include swelling or haematoma[1,2] Lacerations[3] abrasions or even complete avulsion. Middle ear injury frequently results from direct trauma through the external auditory canal or Penetrating trauma. Regardless of the mechanism of injury the tympanic membrane is typically perforated resulting in a conductive hearing loss. Damage to the ossicles, facial nerve and inner ear structures may result from severe trauma. Temporal bone fractures may equally lead to such damage. In this paper, we present a retrospective study of presentation, type and aetiology of ear trauma cases seen at Konaseema Institute of Medical Sciences and Research Foundation, Amalapuram in Andhra Pradesh of South India, over a period of one year. The outcome will enable us to establish the pattern of ear trauma in the sub-region.

METHODS

All patients treated for any cause of ear trauma from Jan 2015–December 2015 in Konaseema Institute of Medical Sciences and Research Foundation, Amalapuram in Andhra Pradesh of South India were studied retrospectively from their clinical records which were certified to contain clear details of the trauma and management offered after obtaining clearance of ethical committee of the institute. Their bio-data and other relevant information were also extracted. The data obtained were analysed using SPSS software and results presented in simple descriptive and tabular forms.

RESULTS

In our study out of 43 patients, 37(84%) were males and 6(16%) were females of ratio accounting to 6.16: 1. Their ages ranged from 10 to 70 years with average age of 33.41 years. Young people were more involved with 21–30 years being the modal age-group affected Table 1. The aetiologies noted were predominated by road traffic accidents RTA 35(81.39%) Table 2. The left ear 23(53.48%) compared to the right ear 15(34.88%) was mostly affected and in 5(11.62%)cases both ears were involved. Acute presentation with bleeding from the ear 26(60.46%) topped the list of presenting signs and symptoms, Table 3.

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Table 1: Patient's Age (n=43)

Age group	No. (%)
1-10	1(2.32)
11-20	7(16.27)
21-30	14(32.55)
31-40	9(20.93)
41-50	5(11.62)
51-60	6(13.00)
61-70	1(2.00)

Table 2: Cause of Ear Trauma (n=43)

Etiology	No. (%)
RTA	35(81.39)
Assault	2(4.65)
Fall	5(11.62)
Cause not known	1(2.32)

Table 3: Presentations

Sign/Symptom	No. (%)
Bleeding from ear	26(60.46)
Tympanic membrane perforation	25(58.13)
Deafness	25(58.13)
Abrasion	23(53.48)
Tinnitus	22(51.6)
Lacerations	12(27.90)
Otto rhea	5(11.62)
Hematoma	5(11.62)
Cauliflower ear	1(2.32)

DISCUSSION

Ear trauma in this study occurred mostly to young males. This is the age group that is engaged in many activities like Sports, Fights, Bike races etc. In our study Road traffic accidents was common cause of ear injury. The sheering force mostly in RTA resulted in Abrasions and Lacerations. Blunt Trauma due to hitting ground resulted in ear bleeding, Tympanic Membrane perforation and haematoma.

Literature reveals right and left sided injuries were equally common. In our study, left sided injury 23(53.48%) dominated with right side injury 15(34.48 %) and involvement of both ears is 5(11.62%). Abrasion 23(53.48%), laceration 12 (27.90%) and haematoma 5 (11.62%) were the presentations referable to the external ear. Abrasions were the commonest form of accidental ear injury 23(53.48%) in our study. Lesions affecting the pinna can lead to disfigurement and change the appeal of the face; they require appropriate intervention. The aim of treatment should be to restore the normal contours of the ear and prevent infection. Prompt surgical intervention with extra cartilaginous suturing under good antibiotic cover as applied in our patients achieved this [1,2,3,4]. Pressure dressing following surgical drainage helped to avoid re-accumulation in case of haematoma. The location of the haematoma within the cartilage itself has been postulated as one of the primary reasons for initial failure [4]. One of the five haematoma cases developed cauliflower ears before presenting. This was as a result of late presentation and the outcome was not as good as the early presenters. Majority of the patients came with bleeding from the ear 26 (60.46%), and perforation of the tympanic membrane 25 (58.13%) associated with temporary hearing loss in 25 (58.13%) and tinnitus in 22 (51.16%) cases implicating the force and severity of injury sustained. Bleeding could be in the external auditory canal, associated with tympanic membrane perforation or deeper middle ear structures or fracture to base of skull/temporal bone. Early presentation and evaluation helps to resolve the issue by appropriate intervention. Traumatic perforations of the TM are often encountered in the emergency room and primary care setting [5] resulted from RTA, and domestic fights/brawls.

There are various causes of acute traumatic rupture of the tympanic membrane that have been reported [6–14]. Open-hand blows, injuries by cotton tipped swabs or foreign bodies, explosions, welding sparks, fracture injury to the temporal bone, barometric causes due to pressure changes like flying, iatrogenic causes such as vigorous syringing of the ear or surgical intervention during insertion of ventilating tubes have been listed [6,8,9]. The trauma causes a sudden increase in the ear canal air pressure [14] leading to rupture of TM. The ear is the organ that is most vulnerable to damage by blast pressure [15,16]. An increase in pressure as little as 5 psi above atmospheric pressure (1atm is equivalent to 14.7 psi, or 760 mm Hg) can rupture the ear drum [17]. The tendency to rupture increases with age with atrophic segments likely to rupture at pressure changes at least 50% lower than a

normal tympanic membrane [17]. In our study there was no case of blast over pressure or explosions. Road traffic accidents (RTA) were the most frequent aetiology in our study. Most of the injuries sustained were of mild to moderate severity and limited to external and middle ears .Baseline pure tone audiometry's were done on presentation, showed mild to moderate hearing loss. Average decibel loss in such people were noted to be <30 dB. Most of the audiograms were obtained within 24 h to 4 days of presentation to the emergency department or clinic. TM perforation closure by healing resulted in 10–20 dB improvement of air-conduction threshold. Majority of these patients returned to normal or near normal hearing. Though controversies exist on the best method of treating traumatic perforations of the tympanic membrane; it has been shown that most acute traumatic perforations heal spontaneously [6, 7, 11, 18, 19]. In our study, the TM healed spontaneously with prophylactic antibiotic coverage and strict following of instruction not to allow water or any other fluid to enter the ear. By 1–2 months of follow up there was complete healing of the TM and return to normal hearing in majority of uncomplicated cases.

Amadasun [20] prospectively examined, in three sections, a group of patients with a cellophane patch (n = 6), another group with a gentamicin ointment seal (n = 15) and a control group (n = 9) with a gentamicin plug placed at the distal end of the external auditory cavity. He achieved successful healing of the traumatic tympanic membrane perforations in 50% of the cellophane seal group, 86.7% of the gentamicin ointment seal group and 77.8% of the control group. He concluded that the management of a fresh tympanic membrane perforation should be clean to prevent infection. Other studies have showed no difference between paper prosthesis and spontaneous healing with treatment by oral antibiotics [18, 19, 21]. However, the mechanism of injury and size of perforation influence the rate of spontaneous healing [19]. The aims of treatment in middle ear injury are to achieve an intact tympanic membrane and restoration of hearing. These are achieved with early presentation and appropriate management. Late presentation and wrong intervention predispose to complications with poor outcome. This was validated in our study by otorrhoea in 5(11.62%) cases and cauliflower ear in 1(2.32%) case. This is due to improper interventions and, delay in presentation as well as ignorance. It was due to the complications that the patients presented for proper treatment.

CONCLUSIONS

We recommend early intervention, wound debridement, early repair, good antibiotic coverage in ear trauma can yield better out come and good cosmetic results with least complications.

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