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Review Article

Ear injuries in tertiary care centre, Government General Hospital Kakinada: a comprehensive review

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ABSTRACT

Objective of the study was to review the presentation, types, and causes of ear injuries and various factors affecting the patients with ear injuries over one year attending Government General Hospital Kakinada. All the patients treated are studied, using their clinical records, and follow-up was made. Data were extracted using Microsoft excel 2010 and statistical package for the social sciences (SSPS) software, the results are presented in simple descriptive and tabular forms. 80 patients, 54 males (67.5%) and 26 females (35.2%) were studied ages 8-74 years with an average of 41±5 years. Road traffic accident (47.5%) was the most common cause of ear injury, followed by self-fall (23.75%) and assault (15%). Ear pain (93.75%) is the most common presenting complaint, followed by bleeding from the ear (71.25%) and hearing loss (35%). External ear injuries are more prone as it is easily accessible it includes lacerations abrasions, hematoma, and avulsion in increasing order, followed by TM perforations. Management and outcomes were good except for a few late presenters with complications.

Keywords: Trauma, External ear, Temporal bone fracture, CSF otorrhea, Etiology, Presentation, TM perforation

INTRODUCTION

Young and active individuals are at risk for ear trauma from the activities in which they engage.[1] Lacerations of the external ear and tympanic membrane rupture can occur in everyday life as well, skull base fractures and barotrauma can cause serious damage to the middle and inner ear leading to problems with balance, tinnitus, facial nerve paralysis, deafness, or even cerebrospinal fluid (CSF) otorrhoea. Rare complications like meningitis may occur in neglected cases. a thorough history and clinical examination are essential to diagnose an ear trauma along with imaging studies, like computed tomography (CT), and magnetic resonance imaging (MRI) to confirm the diagnostic suspicions. The role of ENT specialists, neurosurgeons and plastic surgeons is crucial for better outcomes. This article reviews the basic anatomical structures of the external middle and inner ear and discusses the various causes and specific types of ear trauma and outcomes

Nowadays trauma to the ear is increasing as compared to other injuries. this is a reflection of society becoming a more violent consequence of the widespread urbanism and increased number of road traffic accidents (RTA) and physical assaults, contact sports, and other forms of self-inflicted injuries.

The external, middle and inner ear may be affected in isolation or together depending on the force and type of trauma. The lesions may range from simple blunt trauma to pinna to transverse fractures of the petrous temporal bone, complete avulsion of the external ear, and loss of facial nerve function.

Auricular injuries occur at all ages but are more common in people involved in negligent activities like under alcohol influence and mobile driving. Lesions encountered include lacerations, abrasions, complete avulsion, and thermal insults. Regardless of the mechanism of injury tympanic membrane is typically perforated resulting in hard of hearing. Damage to ossicles, the facial nerve, inner ear structures, and temporal bone fractures may cause inner ear trauma.

In this paper, we present a prospective study of presentation, types, and causes of ear injuries, seen at the tertiary center Government General Hospital (GGH) Kakinada over one year. the outcomes will enable us to get an overview of ear injuries and their incidence.

METHODS

All the patients attending GGH Kakinada with ear injuries from December 2021 – December 2022 were studied from their clinical records which were certified to contain clear details of the trauma and management offered. A total of 80 patients' data and other relevant information were also extracted. All the patients are informed and consent was taken. Images are collected using photographs/endoscopy during the follow-up. The data obtained were analyzed using Microsoft excel 2010 software and results were presented in simple descriptive and tabular form.

RESULTS

Out of 80 patients 54 were males and 26 were females, age ranging from 8 to 74 years, majority of patients comes under the age group 21-30 (26 patient). In our study left ear is more commonly injured than the right, while in 8 cases both ears were injured. road traffic accidents are the most common cause of ear trauma, followed by self-falls and slaps respectively. Pain is the most common symptom followed by bleeding from the ear and hard of hearing. Injury to external ear (laceration, abrasion, hematoma, and avulsion in increasing order) followed by TM perforation. The majority of the patients required oral antibiotics and analgesics followed by suturing and local antibiotic dressing alone. While 75% of the patient can be managed without admission on an outpatient basis, while 25% of patients required admission.

DISCUSSION

Ear trauma in this study occurred mostly in young and healthy members of society. this is the most common age group is 21-30 years with 32.5%, and patients between 2-50 years contribute to about 83.75 of all the cases (Table 1) mainly due to road traffic accidents and physical accidents, with the majority being males to female ratio is approximately 2:1. This could be due to reflection of the source of trauma. Females are more prone to sustain injuries in domestic conflicts.

In our study, only 10% (8 cases) sustained bilateral injuries, while the majority are unilateral (left>right) 40 cases and 32 cases respectively. This left majority is due to most people being right-handed and slaps and blows coming from the dominant hand to the left ear, also Indian road traffic drives on the left side are found majority of RTA to prevent collision to upcoming vehicles divert to left and side and sustain injuries. But in case of direct collision, as the rider sits on the right side and the upcoming vehicles come on the right, the right side is most injured.

Table 1: Incidence of ear injuries with age and sex.

Age groups (in years)	Female	Male	Grand total
1-10		1	1
11-20	4	4	8
21-30	7	19	26
31-40	6	12	18
41-50	5	8	13
51-60	2	7	9
61-70	2	2	4
71-80		1	1
Grand Total	26	54	80

Table 2: Etiology of ear injuries.

Row labels	Count of name	%
Burns-(chemical or electrical)	5	6.25
Foreign body (self or earbud trauma)	5	6.25
Noise trauma	1	1.25
Road traffic accident	38	47.50
Self-fall (from height/loc)	19	23.75
Slap (fight)	12	15.00
Grand total	80	

Injuries include external ear ranges from small abrasions, lacerations, and hematomas to complete avulsion of the face and large lacerations extending into EAC, face, and % neck. Out of which majority are lacerations (45% of all ear injuries) followed by tympanic membrane perforations (35%) and abrasions (23.7) complete avulsion of the ear is the least with 11.2%. EAC lacerations are about 15% of all cases (Table 3).

Injuries to the ear pinna may lead to disfigurement and change the entire appeal of the face hence they required prompt and appropriate intervention. And delay or neglected cases may lead to sequelae infections, perichondritis, aural hematoma, and even necrosis.[2] these injuries should be managed as early as possible, and the aim of treatment should be to restore the normal contours of the ear and to prevent further complications. Prompt surgical intervention under good antibiotic coverage and a sterile dressing was done in our patients.

Table 3: Symptoms and signs of ear injuries.

Symptom and sign	No. of cases	%
Symptom		
Pain	75	93.75
Bleeding from ear	57	71.25
Hearing loss	28	35.00
Tinnitus/ringing sensation	18	22.50
Otorrhea	13	16.25
Facial weakness	13	16.25
Vertigo/vomitings	10	12.50
Total cases	80	
Sign		
Laceration of pinna	36	45.00
Tm perforation	28	35.00
Abrasion of pinna	19	23.75
EAC laceration	12	15.00
Mastoid tenderness	12	15.00
Hematoma of pinna	11	13.75
Facial nerve palsy	11	13.75
Avulsion of pinna	9	11.25
CSF otorrhea	5	6.25

Figure 1: Ear laceration extending into face, (a) before, (b) after suturing, and (c) avulsion of ear.

Figure 2: Lacerations of ear lobule.

Lacerations result from shearing force mostly in RTA cases and hematoma from blunt trauma to pinna, about 11 cases (13.5%) presented with aural hematoma, which is managed with surgical drainage and pressure bandages to avoid re-accumulation with antibiotics to prevent abscess formation, five out of 11 cases can developed cauliflower ear due to late presentation.[3] This late presentation and their outcome is not as good as the early presenters.

The majority of cases presented with ear pain (93.75%) followed by bleeding from the ear (71.25%) and hard of hearing (35%) of cases other symptoms include otorrhea, tinnitus, vertigo, and facial weakness (Table 3).

Figure 3: Lacerations of pinna exposing the cartilage.

Figure 4: Burns injuries over the external ear.

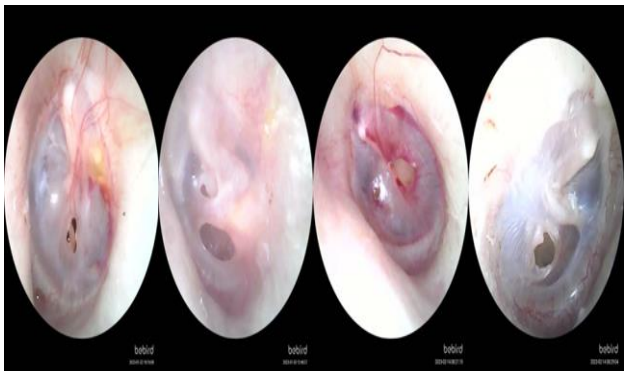

Figure 5: Traumatic tympanic membrane perforation.

Increased intra-aural pressure leads to TM perforation, in our study this raise occurred from slap over face over pinna, self-fall, injuries by cotton buds or foreign bodies, explosions of crackers during Diwali to severe head injuries including fractures of the temporal bone, severe burns injuries. Out of all the cases RTA is the most common cause of ear injuries (47.75%) followed by self-fall from height or loss of consciousness accounting to

23.75% and fights (15%) and other causes are listed in Table 2. Hard of hearing is seen in 28 cases out of 80 cases up on audiometric evaluations majority of cases presented with mild to moderate hearing loss with the majority them being conducive with an of 30 db loss, majority of them are due to TM perforations, and EAC occlusion with blood or edema. They resolved normally once healed tympanic membrane perforations have raged up margins as seen in Figure 5 with blood. management of TM perforations requires prophylactic antibiotics to prevent infections and the patient is instructed not to allow any sort of liquid either in any form even ear drops. The majority of the tympanic membrane perforation cases heal within 2-3 months, and very few cases may land into persistent perforation membrane/permanent perforation which requires tympanoplasty.[5] Amadasun concluded that management of fresh TM perforation should be limited to cleaning the injured external ear, preventing infection, and avoiding moisture.[6]

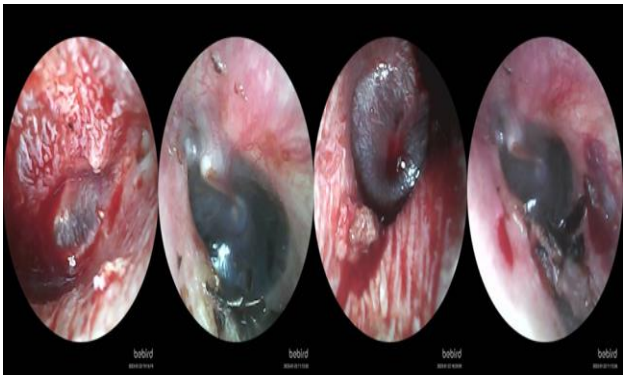

Figure 6: Eac lacerations with hemotympanum.

Figure 7: Aural hematoma, facial nerve palsy, axial section of CT temporal bone showing fractures on both sides.

In our study majority of cases required oral antibiotic coverage (88%) about 50% of cases required suturing followed by local antibiotic dressings 35% of others required hemostatic/antibiotic eardrops, ethamsylate injections, pressure bandaging, and steroids. Few cases of external ear lacerations extending into the face and neck, and avulsion of the ear with loss of tissue may even require plastic surgery intervention.

CONCLUSION

With the increase of urbanization, there was a severe increase in number of vehicles, ease of availability of alcohol and negligence towards traffic rules, head injuries especially injuries to the ear have been increasing. the most common injury sustained is lacerations. Most common presentation after ear pain is ear bleeding. RTA is the most common cause of ear injuries attending GGH Kakinada, the management and outcome of the injuries mostly depend on early presentation and severity of the injury. The majority of the RTA cases are avoidable by wearing a helmet, avoid drinking and driving, and not using telephones while driving.

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