Ear Trauma in Orlu, Nigeria: A Five-Year Review

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Abstract To review the presentation, types and aetiology of ear trauma and various factors affecting ear trauma in our patients over a 5 year period. All patients treated for ear trauma over a 5 year period were studied using their clinical records. Data extracted were analysed using SPSS version 11 software. The results were presented in simple descriptive and tabular forms. Forty-one patients, 18(43.90%) males and 23(56.10%) females were studied, ages 12–43 years, average 26.3 ± 5 years. Blows/Slaps (65.85%) from assault was the commonest aetiology while bleeding from the ear (73.17%), hearing loss (70.73%) and tympanic membrane perforation (68.29%) were the most frequent presentations. Ear trauma is common and mostly affects the tympanic membrane. Sudden increase in canal pressure from blows/slaps was the major mechanism of injury. Management outcome was good except for few late presenters with complications.

Keywords Ear · Trauma · Aetiology · Presentation

Introduction

Trauma to the ear like other forms of trauma is on the increase. This is a reflection of the society becoming more violent consequent upon more wide spread urban terrorism with guns and explosives, 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. Auricular injuries occur in all ages but more common in people involved in high risk activities such as wrestling, boxing and rugby football. However, auricular injury in a child without a confirmed history of trauma should raise the suspicion of a possible child abuse [1] as in bilateral ear injuries in children less than 1 year of age [2]. Lesions encountered include swelling or haematoma [3–8], Lacerations [2, 4], abrasions or even complete avulsion. Middle ear injury frequently results from direct trauma through the external auditory canal. Penetrating trauma, thermal insults and blasts are the usual mechanism of injury. 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 Imo State University Teaching Hospital, Orlu, over a 5 year period. The outcome will enable us to establish the pattern of ear trauma in the sub-region.

Patients and Methods

All patients treated for ear trauma from June 2004–May 2009 were studied from their clinical records which were certified to contain clear details of the trauma and

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management offered. Their bio-data and other relevant information were also extracted. The data obtained were analysed using SPSS version II software and results presented in simple descriptive and tabular forms.

Results

Forty-one patients, 18(43.90%) males and 23(56.10%) Females, ratio 1:1.28 were studied. Their age ranged from 12–43 years with average of 26.3 ± 5 years. Young people were more involved with 21–30 years being the modal age-group affected, Table 1. The left ear 24(58.54%) was mostly affected, Table 2. The aetiologies noted were predominated by blows/slaps Table 3. Acute presentation with bleeding from the ear 30(73.17%) topped the list of presenting signs and symptoms, Table 4.

Discussion

Ear trauma in this study occurred mostly to young and healthy members of the society. This is the youthful age group that is engaged in all sorts of activities that result to injury like sports, fights, road traffic accidents and other

Table 1 Age distribution of patients

Age Group	Frequent	Percentage (%)
0–10	0	0.00
11–20	10	24.39
21–30	19	46.34
31–40	8	19.51
41–50	4	9.76
51–60	0	0.00
Total	41	100.00

Table 2 Laterality of trauma in the patients

Side affected	Frequent	Percentage (%)
Right	17	41.46
Left	24	58.54
Total	41	100.00

Table 3 Aetiology of trauma

Aetiology	Frequent	Percentage (%)
Blows/slaps	27	65.85
RTA	12	29.27
Fall	1	2.44
Foreign body	1	2.44
Total	41	100.00

Table 4 Presentation of patients

Signs/symptoms	Frequent	Percentage (%)
Bleeding from the ear	30	73.17
TM perforation	28	68.29
Haematoma of pinna	8	19.51
Laceration of pinna	5	12.20
Otorrhoea	4	9.76
Grednigo's syndrome	2	4.88
Hearing loss	29	70.73
Tinnitus	27	65.85

adventures. It is also the age group that mostly engaged in conflicts with law enforcement agents Females (56.10%) were more affected despite the more adventurous nature of males. A sharp contrast is noted from a similar study in children [2] where the majority of the patients were male (73%). This could be a reflection of the source of trauma. Women are likely to sustain injuries in domestic conflicts. Whereas right and left sided injuries were equally common (51% right) in the said study, left sided injury (58.54%) dominated ours. Most people are right handed and slaps come from this dominant hand to the left ear. Laceration (12.20%) and haematoma (19.51%) were the presentations referable to the external ear namely the auricle. Lacerations resulted from sheering force mostly in RTA cases and haematoma from blunt trauma to the pinna. While lacerations were the commonest form of accidental ear injury (56%) in the study in children above, it constituted only a negligible proportion (12.20%) in this study. This may be related to the age incidence. Lesions affecting the pinna can lead to overt disfigurement and change the entire appeal of the face; they require prompt and appropriate intervention. The aim of treatment should be to restore the normal contours of the ear and prevent infection. Prompt surgical intervention under good antibiotic cover as applied in our patients achieved this [3–8]. 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 [5]. Five of our eight haematoma cases developed cauliflower ears before presenting. This was as a result of late presentation and their outcome was not as good as the early presenters. Majority of the patients came with bleeding from the ear (73.17%), hearing loss (70.73%) and perforation of the tympanic membrane (68.29%) projecting the force and severity of injury sustained. Increased intra-aural pressure from open hand slaps during fight, brawls, and domestic fights lead to TM perforations Bleeding could be limited to the external auditory canal, tympanic membrane perforation or deeper middle ear structures; or fracture base of skull/temporal

bone. Early presentation and evaluation will help resolve the issue and appropriate intervention instituted. But this is not always the case. Traumatic perforations of the TM are often encountered in the emergency room and primary care setting [9]. They resulted from fights/brawls and domestic fights; and slaps from law-enforcement agents especially the police. Various causes of acute traumatic rupture of the tympanic membrane have been reported [10–18]. Open-hand blows, injuries by cotton tipped swabs or foreign bodies, explosions as a result of blast overpressure, welding sparks, fracture injury to the temporal bone, barometric causes due to environmental pressure changes like flying and scuba diving, iatrogenic causes like vigorous syringing of the ear or surgical intervention during insertion of ventilating tubes have been listed [10, 12, 13]. Blows/slaps were the most frequent aetiology in this study. Most of the injuries sustained were mild to moderate in severity and limited to external and middle ears. Those whose baseline pure tone audiometries 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. Closure resulted in 10–20 dB improvement of air-conduction threshold. Majority of these patients returned to normal or near normal hearing with subsequent follow up. The blow/slap caused a sudden increase in the ear canal air pressure [18] leading to TM rupture. The ear is the organ that is most vulnerable to damage by blast over pressure [19, 20]. An increase in pressure of as little as 5 psi above atmospheric pressure (1 atm is equivalent to 14.7 psi, or 760 mmHg) can rupture the human ear drum [21]. The tendency to rupture increases with age and atrophic segments are likely to rupture at pressure changes at least 50% lower than a normal tympanic membrane [21]. A negative canal pressure produced by a sucking action during kissing has been reported to cause tympanic membranes rupture; leading to mild [17] and permanent [14] ear injury. In our study there was no case of blast over pressure or explosions. Although 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 [10, 11, 15, 22, 23]. In our study, the TM healed spontaneously with prophylactic antibiotic cover and strict observations of the instruction not to allow water or any other fluid enter the ear. By 1–2 months follow up there was complete healing of the TM and return to normal hearing in majority of uncomplicated cases. It is generally accepted that any in-turned epithelial edges should be returned to their native anatomic position [24]. Amadasun [25] 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 limited to cleaning the traumatized ear and preventing infection. Similarly, other studies have shown no significant difference between paper prosthesis and spontaneous healing with treatment with oral antibiotics [22, 23, 26]. However, the mechanism of injury and size of perforation influence the rate of spontaneous healing [23]. By and large the aims of treatment in middle ear injury are achieve an intact tympanic membrane and restoration of hearing. These are achievable with early presentation and appropriate management. Late presentation and wrong intervention predispose to complications and poor outcome. This was validated in this study by 4(9.76%) and 2(4.88%) who presented with otorrhoea and Grednigo's syndrome, respectively. They resulted from improper interventions by non-specialist doctors, quacks, patent medicine dealers, pharmacists and native doctors, delay in presentation as well as ignorance. It was the complications that forced the patients to present for proper treatment.

Conclusions

Trauma to the ear is common and on the increase. The tympanic membrane is mostly affected despite its protected location. The most frequent agent of trauma is blows/slaps from assault. Early presentation and appropriate management yields a desirable outcome.

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