A Study of Pinna Injuries and their Management
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**Background:** Ear trauma is complex, as different harmful agents can affect different parts of the ear. The causative agents for ear trauma include mechanical and thermal factors, chemical injuries, and pressure changes. Since physicians who are not specially trained in otology often provide the initial care of ear injuries, proper recognition and treatment are critical to avoid possible complications, and to improve treatment outcomes.

**Objective:** This study was conducted to examine the various types of pinna injuries that occurred as a result of mechanical trauma, their management and treatment outcome.

**Materials and Methods:** In this prospective case series, Sixty consecutive cases of otological trauma were studied for a period of one year at Karnataka Institute of Medical Sciences, Hubli, Karnataka, India. Injuries to the pinna constituted 40% of these cases. All cases were managed under local anaesthesia by thorough irrigation, debridement and suturing of skin edges. Contour of pinna was maintained where necessary by applying stay sutures to cartilage or pressure dressing. Prophylactic antibiotics were given to prevent infection.

**Results:** Complete healing without any deformity or occurrence of chondritis following appropriate surgical management took place in 66.7% of these cases. In 12.5% of cases, healing took place without deformity after occurrence of chondritis, while the same percentage of cases developed minor deformity following chondritis. Amputation of part or whole of pinna was seen in 8.33% of cases.

**Conclusion:** Road traffic accidents were the commonest cause of otological injuries, followed by injuries due at assault and brawls. Auricle was the most often injured part of the ear. Meticulous and timely surgical management with efforts to maintain contour of pinna and prevention of infection helped minimise disfigurement.

**Keywords:** Pinna, Chondritis, Disfigurement.
INTRODUCTION

Otological injuries are a common presentation to the otolaryngologist and can be most challenging at times. The external ear is commonly involved in facial / head trauma. Injuries to the pinna can range from simple lacerations to complete avulsions. Some of these injuries can lead to haematoma and chondritis causing cosmetic disfigurement. A prospective study of 60 consecutive cases of otological trauma was conducted for a period of one year at Karnataka Institute of Medical Sciences, Hubli, Karnataka, India. The pinna was the most commonly injured part of the ear constituting 40% of the cases. The different types of pinna injuries encountered, their management and treatment outcome is described in this paper. Furthermore, we review the literature on soft tissue injuries of the ear and present a simple algorithm for managing injuries to the pinna.

MATERIALS AND METHODS

This prospective study comprised of 24 cases of pinna injuries encountered at Karnataka Institute of Medical Sciences, Hubli, Karnataka, India during a period of one year. Patients who presented to the hospital with any kind of injury to the ear caused by road traffic accidents (RTA), falls and assaults were included in the study. Those with radiation or thermal injuries to the ear were excluded from the study. Detailed history and findings of Ear, Nose and Throat (ENT) examination were recorded in specifically constructed proforma. All these cases of pinna injury were managed under local anaesthesia. A thorough wash was given with normal saline, hydrogen peroxide and povidone iodine solution. Devitalised tissues were debrided. Skin edges were sutured with 4-0 silk giving due consideration for proper alignment and cosmesis. When necessary, stay sutures were applied to the cartilage or pressure dressing was applied to maintain contour. Patients were put on a course of antibiotics (ciprofloxacin 500 mg b.i.d.) prophylactically for a period of 7 days. Suture removal was done on the 7th day. Patients who developed chondritis were treated by evacuating the pus and debridement of devitalised cartilage. Intravenous antibiotics were administered based on culture and antibiotic sensitivity report and wound dressing was done on a daily basis until the inflammatory signs resolved completely. Patients were called for follow up 2 weeks later and 2 months thereafter. The outcome of treatment was measured in terms of healing without
complications such as chondritis or cosmetic deformity.

RESULTS
Twenty four cases of pinna injuries were encountered during the study period of 1 year. The most common cause of pinna injuries was RTA accounting for 41.67%, followed by assault in 37.5%. Fall contributed to 16.67%. One case was caused by dog bite (Table 1). Following treatment, complete healing without any deformity or chondritis occurred in 66.67% (n=16) of cases (Fig. 1-3). Amputation of part or whole of the pinna resulting in deformity was seen in 8.33% (n=2) cases (Fig. 4). Only 25% (n=6) cases developed chondritis. Of these 12.5% (n=3) cases healed without deformity (Fig. 5, 6). The pinna injury which occurred following dog bite also healed completely (Fig. 7, 8). Minor deformity of the pinna occurred in

| Table 1: Causes of Pinna Injuries |
|----------------------------------|
| **Cause** | **Number of Cases** | **Percentage** |
| RTA       | 10                  | 41.67%         |
| Assault   | 9                   | 37.5%          |
| Fall      | 4                   | 16.67%         |
| Dog bite  | 1                   | 4.17%          |
| Total     | 24                  | 100%           |

| Table 2: Sequelae of Pinna Injuries |
|------------------------------------|
| **Sequelae** | **Number of cases** | **Percentage** |
| Complete healing | 16                  | 66.67%         |
| Healing without deformity after chondritis | 3 | 12.5%          |
| Minor deformity because of chondritis | 3 | 12.5%          |
| Deformity because of amputation | 2 | 8.33%          |

Figure 4: Partial amputation of pinna

Figure 5: Chondritis following pinna injury

Figure 6: Healing following occurrence of chondritis

12.5% (n=3) cases (Table 2). Significant cosmetic disfigurement following chondritis was not observed in any of the cases.
**DISCUSSION**

Although the unprotected pinna is readily accessible to trauma, physical injury to pinna is less common. This is because; the auricular frame work is made up of elastic cartilage and is hence easily deflected and difficult to fracture. Injuries to the pinna may result from blunt or sharp trauma and also thermal injuries. Sharp trauma may range from minor lacerations of the pinna or ear lobule to total avulsion of the auricle. Expeditious repair and prevention of infection are essential for minimising cosmetic disfigurement. Copious irrigation to remove contaminants and foreign bodies is essential. Cut cartilage should be approximated with suturing posterior perichondrium or intercartilaginous sutures with 5-0 catgut. Skin is closed with 5-0 or 6-0 nylon sutures. Attempts should be made to preserve all remaining viable tissue. Use of local flaps and skin grafts to preserve and cover perichondrium and exposed cartilage has been recommended. Stenting of wound with light contour dressing under antibiotic cover is recommended for preservation of contour.

Partial or total avulsed pinna can be reattached after thorough washing and debridement. The patient is heparinised to prevent microvascular clotting. Survival of the pinna depends on establishment of capillary circulation. Microvascular re-anastomotic techniques can be used. Reconstruction of avulsed pinna can be done using composite grafts from opposite ear, costal cartilage and local pedicled flaps. Re-implantation can also be done by dermabrading the avulsed part, reattaching and placing it in a postauricular pocket. After 2-3 weeks, the buried portion may be exposed and allowed to re-epithelialise. Performing reattachment with microvascular anastomosis is being preferred recently.

Chondritis is the most serious complication. Pseudomonas and mixed flora are common pathogens. Initial symptoms are red, hot and painful pinna. Later, abscess may form between the cartilage and perichondrium with necrosis of cartilage. It requires prompt removal of pus and necrotic cartilage. Chondritis may result in disfigurement.

Lacerations of pinna are the most common form of injury to the ear. Most of them are caused by motor vehicle accidents, recreational activity mishaps, brawls and job related injuries. The pinna heals in vast majority of cases if usual precautions are observed, the goal of treatment being restoration of normal contour of pinna and preventing infection. The most dreaded complications of auricular lacerations are chondritis and poor cosmetic results.

In this study, pinna injuries constituted 40% of the cases of otological trauma. Males comprised majority of the cases and were in the age group of 21-40 years. This could be explained by the tendency for aggressiveness in this group. Outdoor and dangerous activities are undertaken predominantly by males in Indian society. RTAs were the commonest mode of injury followed by assaults or brawls.

It was observed that meticulous and timely management by thoroughly washing the
wound, debridement of devitalised tissue, sutting of skin edges, application of stay sutures to cartilage when necessary, pressure dressing with contour maintenance and prophylactic antibiotics helped in healing without any complications. In cases where chondritis occurred, evacuation of pus and debridement of devitalised cartilage with intravenous antibiotics and daily wound dressing helped in minimising cosmetic disfigurement of the external ear.

CONFLICTS OF INTEREST
None declared

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