

Foreign Bodies in External Auditory Canals: Experience of 653 Cases Over 8 Years

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ABSTRACT

OBJECTIVE: To analyse the spectrum of presentation and management of foreign bodies in external auditory canal.

STUDY DESIGN: Retrospective analysis of data.

PLACE AND DURATION: District Government Hospital Paretabad Hyderabad (Sindh) Pakistan over a period of 8 years, i.e. from July 1999 to June 2007.

Methods: A pre designed proforma was used to collect the data regarding patients' demographics, frequency and type of foreign body, management and outcome.

RESULTS: Total 653 patients with foreign bodies in external auditory canals were dealt with over a period of about eight years. The age variance was from 1-65 years. Most of the foreign bodies i.e. 163 (25%) were retrieved in the children up to two years of age. A wide variety of foreign bodies totally numbering 41 were retrieved from external auditory canals. Stone/concretion were the single most frequently removed foreign body constituting 32.6%. Jobson Horne Probe was the single most frequently used tools which was utilized in 37% of the cases to remove different types of foreign bodies. General anesthesia was employed in only 11.79% of the cases. Operating loupe was used in 53.13% of the cases. Morbidity occurred in 11% of the cases with tympanic membrane perforation occurring in 0.6% of the case.

CONCLUSION: Different types of foreign bodies are prevalent in different parts of the world. Similarly different methods of removal are adopted dictated by the nature, location and state of the foreign body at the particular instant.

KEY WORDS: Foreign bodies, External auditory canal, presentation, management, Jobson Horne probe.

INTRODUCTION

Foreign body insertion in an orifice of ENT frequently constitutes an emergency. The signs and symptoms of such foreign bodies are determined by the type and site, its duration and the previous attempt of its removal. The mode of insertion of foreign body may be different in children and adults. In children it may be voluntary due to the development of Pincer grasp, which fully develops by the age of 9 months and it enables the children to be very inquisitive and eager to explore their environment and probe around the body orifices, especially within the head and neck region¹. Similarly, the foreign body may be inserted by the fellow children during play. In adults the foreign body may be inserted during cleaning the ear with match stick or the Q-tips² or while inserting the cotton in external auditory canal after instilling the ear drops. It may be accidental as in case of the flying or house hold insects. In some parts of the world foreign bodies like leaves and other plant materials are inserted into the external auditory canal deliberately as a form of native remedy³. Another mode of insertion is noted in patients with psychiatric disorders who insert foreign bodies into their ears as a form of self-mutilation called ear-stuffing⁴. The spectrum of foreign bodies inserted into the ex-

ternal auditory canal is wide and varies in frequency with different age groups and geographical locations. These foreign bodies are animate as well as inanimate. The removal of these foreign bodies from the external auditory canal can be done by a variety of instrumental modalities, either alone or in combination, dictated by various factors like the age of patient, state of external auditory canal, nature of the foreign body, duration of the stay of the foreign body and previous attempt of its removal. It is essential to re-examine the ear canal and the tympanic membrane after removal of the foreign body to assess any damage to the delicate skin of the ear canal and to document the state of the tympanic membrane⁵.

This study describes the spectrum of the nature of the foreign bodies in this part of the world and their management aspects with respect to the limited resources in a society of low income.

MATERIALS AND METHODS

This retrospective study is consisted of 653 patients who consulted to the ENT department of District Government Hospital Paretabad Hyderabad (Sindh) Pakistan from July 1999 to June 2007 with history of foreign objects present in the external auditory canal. District Government Hospital Paretabad is a secon-

dary care hospital located in Paretabad zone in the east of Hyderabad, which is the fourth largest city of Pakistan. This hospital has a catchment area of about 1/3rd of Hyderabad city. All the foreign bodies were retrieved by the otolaryngologist or the well trained Senior Medical Officers in an office setting, which was equipped with the required instruments and arrangements to remove the foreign bodies in both the sitting and lying positions with good light and an operating loupe of 4x magnification. The patient or the caregiver was briefed about the procedure. Children usually held in what is called ENT examination position, with additional helpers available to further stabilize the child's head. In very young or un-cooperative child, the child was laid supine, wrapped in a bed sheet and effectively restrained with additional helpers to firmly stabilize the head. However, those cases which needed anesthesia were dealt in the operation theatre. Patients' data were reviewed and cases with complete record were selected. All information was collected in pre-designed proforma, entered and analysed using SPSS v.11. The data collected included the month of the year at presentation, name, age, gender, laterality, mode of presentation, duration of foreign body retained, nature of the foreign body, method of removal, use of any anesthesia or restraint, use of operating loupe and the development of any complications. Finally the results were deduced and presented in the form of frequencies and proportions.

RESULTS

This study spans over a period of eight years extending from July 1999 to June 2007. Ignoring the periods of absentia, this study is spread over 87 months with an average of 7.5 patients per month. No any variation pattern of the number of foreign bodies in a particular month of the year or the season was noted in our study.

The age range is 1-65 years with mean age being 5.9 years. The maximum patients in a single age group are 163 (25%) in the age of two years. Similarly, most patients were from 2-5 years of age, which comes out to be 492 (75.3%) patients. However, broadly considering, patients up to the age of 5 years comprise 78% of study population.

This study comprises 316 (48.4%) males and 337 (51.6%) females showing slight female preponderance.

Three hundred and twelve (47.8%) patients had foreign bodies in right ear, 322 (49.3%) in left ear and 19 (2.9%) in both ears.

Six hundred and thirty-seven (97.5%) foreign bodies were single while 16 (2.5%) were multiple in numbers. Majority (52.4%) of the patients presented with pain in the ear. Different presentations are detailed in **Table I**.

During study period 201 (30.8%) of the foreign bodies were presented in less than 24 hours and 225 (34.5%) were after 24 hours; while duration of retained FB was unclear in 227 (43.8%) patients.

A total of 41 types of foreign bodies were recovered. Out of them 10 (1.5%) were animate and 643 (98.5%) were inanimate. Further analysed, 12 (1.8%) were metallic and 67 (10.3%) comprised seeds, grains and cereals. Stone/concretion were the most frequently retrieved foreign body i.e. 213 (32.6%). Among the other notables were cotton 93 (14.2%), betel nut 62 (9.5%), bead 52 (8.0%), paper piece 32 (4.9%) and match stick piece 30 (4.6%), as detailed in **Table II**.

Four instrumental modalities were utilized either alone or in combination as detailed in **Table III**. Single instrumental modality was used in 622 (95.3%) patients while combination of modalities was utilized in 31 (4.7%) patients. The most utilized single instrument in this study was Jobson Horne Probe, used in 241 (36.9%) patients.

In 576 (88.2%) patients, effective restraint worked and no anesthesia was required. Operating loupe were used in 347 (53.13%) patients in which restraint could not work effectively.

In this study 72 (11.0%) patients developed some form of complications. Laceration/abrasion of external auditory canal occurred in 32 (4.9%), external otitis in 36 (5.5%) and tympanic membrane perforation in 4 (0.6%) patients.

TABLE I: MODE OF PRESENTATION OF FOREIGN BODIES IN THE EXTERNAL AUDITORY CANALS (n=653)

| Presentation | Frequency | % |
|----------------------------|-----------|------|
| Pain in the ear | 342 | 52.4 |
| Blockage in the ear | 122 | 18.7 |
| Pain & blockage in the ear | 131 | 20.1 |
| External otitis | 22 | 3.4 |
| Bleeding from the ear | 20 | 3.1 |
| No symptoms | 16 | 2.5 |

DISCUSSION

The removal of foreign bodies from the external auditory canals is a procedure which must be tailored individually. In this study, this protocol was observed by considering the age of the patient, nature of the foreign body, location of the foreign body, previous attempt at removal, duration of stay of the foreign body, assurance of the good restraint and the availability of good light and proper instruments.

Most of the reports of foreign bodies in the external

TABLE II: TYPES OF FOREIGN BODIES IN EXTERNAL AUDITORY CANALS (n=653)

| Type of foreign body | Frequency | % |
|--------------------------|-----------|------|
| Stone/ Concretions | 213 | 32.6 |
| Cotton | 93 | 14.2 |
| Betel nut piece | 62 | 9.5 |
| Bead | 52 | 8 |
| Paper piece | 32 | 4.9 |
| Match stick piece | 30 | 4.6 |
| Gram | 24 | 3.7 |
| Eraser piece | 23 | 3.5 |
| Foam piece | 16 | 2.5 |
| Plastic toy part | 14 | 2.1 |
| Orange seed | 14 | 2.1 |
| Maize grain | 9 | 1.4 |
| Pencil tip | 8 | 1.2 |
| Bangle piece | 8 | 1.2 |
| Split green gram | 7 | 1.1 |
| Pea | 6 | 0.9 |
| Ant | 6 | 0.9 |
| Plastic button | 4 | 0.8 |
| Disc battery | 3 | 0.5 |
| House fly | 3 | 0.5 |
| Metal wire piece | 2 | 0.3 |
| Metal part of ball pen | 2 | 0.3 |
| Metallic ball | 2 | 0.3 |
| Sweet ball | 2 | 0.3 |
| Chalk piece | 2 | 0.3 |
| Lentil pulse | 1 | 0.2 |
| Ear ring nut | 1 | 0.2 |
| Metallic screw | 1 | 0.2 |
| Wheat grain | 1 | 0.2 |
| Rice grain | 1 | 0.2 |
| Leather piece | 1 | 0.2 |
| Toffee piece | 1 | 0.2 |
| Thermo pore piece | 1 | 0.2 |
| Water melon seed | 1 | 0.2 |
| Plastic back of ball pen | 1 | 0.2 |
| Metal nut | 1 | 0.2 |
| Cockroach | 1 | 0.2 |
| Clove | 1 | 0.2 |
| Green Cardamom | 1 | 0.2 |
| Black pepper | 1 | 0.2 |
| Glass piece | 1 | 0.2 |

TABLE III: METHODS OF REMOVAL (n=653)

| Method of removal | Frequency | % |
|--------------------------|-----------|------|
| Jobson Horne Probe (JHP) | 241 | 36.9 |
| Syringing (S) | 184 | 28.2 |
| Crocodile forceps (CF) | 179 | 27.4 |
| Suction clearance (SC) | 18 | 2.8 |
| JHP+S | 18 | 2.8 |
| JHP+CF | 7 | 1.1 |
| JHP+SC | 3 | 0.5 |
| CF+SC | 2 | 0.3 |
| JHP+CF+SC | 1 | 0.2 |

TABLE IV: SIGNIFICANT STUDIES OF FOREIGN BODIES IN EXTERNAL AUDITORY CANALS

| Authors | Period of study | No. of aural foreign bodies removed |
|--|-----------------|-------------------------------------|
| Ibekwe et al 2007 | 9 years | 2017 |
| Fasunla et al 2007 ¹⁹ | 9 years | 323 |
| Ologe et al 2007 | 5 years | 294 |
| Singh et al 2007 | 2 years | 738 |
| Endican et al 2006 | 15 years | 711 |
| Ryan et al 2006 | 8 years | 330 |
| Martin & Trainor 2006 | 5 years | 254 |
| Mackle T & Colon B 2006 ²⁰ | 2 years | 82 |
| Tiago et al 2006 | 2 years | 57 |
| Ngo et al 2005 ²¹ | 10 months | 117 |
| Wada et al 2003 ²² | 16 years | 509 |
| Thompson wt al 2003 | 3 years | 162 |
| Schulz et al 2002 | 6 years | 698 |
| Di Muzio & Deschler 2002 ²³ | 1 year | 36 |
| Amjad & Abbas 1999 | Not found | 100 |
| Ansley & Cunningham 1998 | 5 years | 191 |
| Dubois et al 1998 ²⁴ | 15 months | 40 |
| Balbani et al 1998 | 6 months | 93 |
| Bressler & Shelton 1993 | 1 year | 98 |

auditory canal consist of isolated and interesting cases and the reports signifying the spectrum of the nature of the foreign bodies are relatively scant in the world literature. When searched for the foreign bodies in the ear, we found very few studies that were significant both in term of period of study as well as for the number of foreign bodies retrieved (**Table IV**). This study is expected to occupy a leading position in this list both in terms of the period of study as well as the number of foreign bodies removed.

The retrieved foreign bodies in our study were compared with other studies in world literature and it was noted that certain foreign bodies were more prevalent in certain areas. The most frequently retrieved foreign body in our study was stone/concretion i.e. 213 (32.6%) followed by cotton 93 (14.2%), betel nut 62 (9.5%), bead 52 (8 %), paper piece 32 (4.9%) and match stick piece 30 (4.6%). When analyzed further, it was noted that 10 (1.5%) foreign bodies retrieved in our study were animate, 12 (1.8%) metallic and 67 (10.3%) were grains/seeds/cereals. Stone was also the most frequently retrieved foreign body i.e. 39% in the study by Endican et al⁶ in Melanesia. In USA cockroaches were the most frequently retrieved foreign body in the studies of Baker and Bressler⁷, and Shelton³ to be 51% and 44% respectively. Similarly, beads were the most frequently retrieved foreign body in the studies of Amjad and Abbas (Pakistan)⁸ 67%, Hons et al (Malaysia)⁹ 39%, Anslay and Cunningham (USA)¹⁰ 16% and Schulze et al (USA)¹¹ 15%. In India, inanimate non-vegetable foreign bodies were the most frequent i.e. 43.5% in the study by Mishra et al¹². Grains/seeds were the most frequently retrieved foreign body constituting 27.9% in the study by Ologe et al¹³. In Brazil, Balbani et al¹⁴ retrieved beans in 25% of cases while Tiago et al¹⁵ retrieved cotton in 31.6% of the cases. Though we did not consider children and adults separately in our study, Ryan et al² in Australia retrieved most of the foreign bodies in adults to be the cotton wool tips of cotton buds (35%), which were used by general population for cleaning or itching of external auditory canal.

The importance of proper and effective restraint to avoid the accidental injury during foreign body removal cannot be over emphasized. Since we dealt with patients belonging to very poor socio-economic group who usually could not afford the expenses of anesthesia and hospitalization, therefore most of the times we resorted to restrain the patient with the use of bed sheet and additional helpers. We employed general anesthesia in 77 (11.79%) patients as compared to general anesthesia employed by Baker⁷

(0.7%), Ologe et al¹³(4%), Balbani et al¹⁴ (8.6%), Schulze et al¹¹ (10.3%), Mishra et al¹² (13.1%), Thompson et al¹⁶ (19%) and Anslay and Cunningham¹⁰ (30%).

The armamentarium for the removal of foreign bodies in our set up comprised, Jobson Horne probe, aural syringe, aural crocodile forceps and electric suction with Frasier Nozzle, either alone or in different combinations. The method of removal employed was dependent upon the nature of foreign body, state of external auditory canal and the cooperation received from the patient. Hence, Jobson Horne probe was the single most utilized tool, which was used in 36.9% of cases.

Operating loupe with 4x magnification was preferred in those cases where foreign bodies had occupied most of the circumference of the external auditory canal, so that laceration of canal skin could be avoided by cautiously remaining in the plane between the canal wall and the foreign body. The combination of modalities was utilized in 4.7% of cases. Tiago et al removed 40.35% of foreign bodies with Alligator forceps, 31.6% with a curette and 14% with more than one method. By observing the results keenly, it is evident that though no particular method was adhered to for the removal of a particular foreign body but as a general guideline rounded and smooth surfaced foreign bodies and those not occupying the whole of the circumference of the external auditory canal were mostly retrieved using aural syringe; those occupying most of the circumference were extracted using Jobson Horne Probe, taking care to be in the plane between the wall of the external auditory canal and the foreign body avoiding undue pressure over the external auditory canal so as to avoid its laceration. Similarly, graspable foreign bodies were removed using aural crocodile forceps and the foreign bodies with semisolid texture were sucked out using electric suction with Frasier's nozzle. However, where needed more than one modalities were utilized to facilitate the safe removal of the foreign body. In case of the foreign bodies which could swell up with water, like seeds etc., water irrigation using aural syringe was avoided. Similarly in case of disc battery water irrigation was avoided because of potential hazard of liquefaction necrosis due to leakage of electrolytes. Insects when encountered alive, first drowned by instilling liquid paraffin or similar oil and later removed by syringing or other means.

Complication rate in this study was 11% and can be favorably compared with other studies including Marin et al¹⁷ with 12%, Anslay and Cunningham¹⁰ with 13.6%, Balbani et al¹⁴ with 14%, Singh et al¹⁸ with

19.5%, Tiago et al¹⁵ with 23% and Ologe et al¹³ with 24.5%. Most of the foreign bodies in this study i.e. 576 (88.2%) were retrieved in the office setting using effective restraint because of patient's financial constraints who could not afford the expenses of general anesthesia and the related affairs which increase the cost of foreign body removal from that of the office setting by more than ten times. However, despite a high proportion of the cases managed in the office setting, complication rates in our study were within acceptable levels. It remains the blessing of effective restraint of the patients using additional helpers to stabilize, coupled with the assurance of good light and magnification. Removal was performed under general anesthesia where it was unsafe to perform with restraint effectively.

CONCLUSION

It is not surprising to have stones and betel nuts to be commonest foreign body in our part of the world, where children play in dirt and concrete and their parents are habitual of chewing betel nuts. We also conclude that the method of removal should be chosen depending on the type of foreign body and the state of external auditory canal. Although proper restraint with good magnification and illumination works in most cases for removal of foreign body, in selected cases general anesthesia is unavoidable.

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