Foreign bodies in the ears in children: the experience of the Buenos Aires pediatric ORL clinic

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Even if foreign body (FB) insertion in the external auditory canal (EAC) is not an uncommon event, the literature based on large series is scarce. In the present study, ear FB cases observed at the Children's Hospital Gutierrez in Buenos Aires over five years of otorhinolaryngology (ORL) activity are presented, and the main findings are compared with data coming from other well-known published case series.

Three hundred ninety-two injury cases were observed. Eighty percent of them occurred while the child was playing; in 328 cases (83.7%), adults were present. The retrieved FB included food items and objects usually available at home, such as pins, while fragments of toys were found in only 2 cases.

These findings testify to the efficacy of regulations imposing manufacturing quality standards on toys; on the other hand, parents seem to be unaware of the risk imposed by FB insertion, since injuries usually happen under adult supervision while children are manipulating objects not adapted for their age.

Key words: foreign body, injuries, ear damage, injury prevention, trans-cultural epidemiology.

Foreign body (FB) insertion in to the external auditory canal (EAC) is not an uncommon event in emergency medicine[1]. In fact, several factors may lead children to insert FBs intentionally into their ears, including curiosity, the wish to explore the orifices of the body, irritation caused by otalgia, attraction to small, round objects, or simply for fun[2,3].

Although not life-threatening, the placement or presence of FBs in the ear canal and their subsequent removal can be a source of significant morbidity. This is particularly true in children because of the smaller anatomic dimensions and a variable level of cooperation[4].

Despite the frequency and potential for morbidity, there is very little literature based on large series of FBs in the ear in children[2,5].

However, the integration of information coming from different clinical settings is commonly felt as fundamental in all therapeutic and preventive actions needed to handle this issue, including the identification of risky FBs and hazardous behavior, the diffusion of guidelines regarding the appropriate management of FBs and the implementation of effective educational strategies.

The aim of the present paper was to present ear FB cases observed at the Children's Hospital Gutierrez in Buenos Aires over five years of otorhinolaryngology (ORL) activity and to compare the main findings with data coming from other well-known previously published case series.

Material and Methods

Data Collection

Anamnestic and clinical data regarding children (0-14 years) presenting with FBs in the ears

were prospectively collected by mean of a standardized form at the Children's Hospital Gutierrez in Buenos Aires. The information collected included the children's sex and age, injury dynamics (adult presence or not and activity performed that caused the injury), FB type and location, clinical presentation, and removal techniques utilized.

Statistical Analysis

Details on the injuries were collected, and the demographic characteristics of the children, features of the object, circumstances of the injury, clinical presentation, and outcomes (complications and removal details) were described.

Moreover, a search on the PubMed database was performed in order to retrieve other case series describing FB in the ear representative of different cultural and geographical backgrounds. In 2008, Gregori et al.[1] performed a retrospective study including major hospitals of 19 European countries and reported on 498 FB-associated injuries that occurred between 2000-2002 in children aged 0-14 years. In 2002, Schulze[5] conducted a retrospective analysis of 698 consecutive cases of pediatric EAC FBs in 605 patients who presented to the Children's Hospital of Wisconsin over a six-year period. Ijaduola[6] in 1986 prospectively studied 400 cases of patients with ear FBs who presented over one year in the Ear, Nose and Throat (ENT) Clinic and in the Casualty Department of the Lagos Teaching Hospital, Nigeria. Finally, a prospective study of 233 cases was carried out at the ENT service and at the Emergency Service of Sadar Hospital in Jalpaiguri, India, each over a period of two years, by Das[7] in 1984.

For all reviewed papers, data regarding the children's age and sex, FB type and location, presence or not of adult supervision, most frequent symptom and complication, and delay in diagnosis were extracted and compared with our experience.

Results

Over five years, 392 cases of FB insertion in the ears were identified. The mean age of the children was 5.03 years (SD 1.29). In the majority of cases (311 patients), the injuries occurred while the child was playing; in 328 cases (83.7%), adults were present.

Table I presents all the retrieved FB data. Children frequently (1123 cases) insert small round objects with a rigid consistency in their ears, like pearls or seeds or acuminate objects such as pins and nails. In the majority of cases (324), children were asymptomatic. However, 43 cases presented hypoacousia and 25 with pain.

In 227 cases (58%), the diagnosis was formulated within 3 hours after the injury and in 116 cases (30%) within 3-24 hours; the FB was detected after more than 24 hours

Table I. Description of Retrieved Foreign Bodies

Foreign Bodies	
pearls	67
seeds	37
paper	36
rubber	30
pins, nails, screws	28
plastic pieces	28
cotton	18
stones	15
food	13
plasticine	13
nuts	12
bread	11
balls	10
chalk	10
beans	7
chewing gum	7
polystyrene	6
fruits	5
fabric	3
grass	3
meat	3
wood	3
bones	2
thread	2
tops	2
toys	2
wire	2
blister	1
carrots	1
earrings	1
file	1
potato	1
raisin	1
teeth	1
toothpick	1
vegetables	1
unspecified	8
Total	392

in only 24 cases (6.1%). In 25 patients, no information was available regarding duration until diagnosis.

Removal was performed in 269 cases by irrigation, in 122 by forceps and in 1 case by hook. General anesthesia was needed in only 33 (8.4%) cases. No complications were observed.

Table II provides a comparison between characteristics of the present case series and characteristics of previously published case series. However, some information (such as the adult presence) is frequently underreported, and more generally, information is not univocally categorized, thus impairing any comparative efforts.

Discussion

The removal of FBs from the EAC is a common task performed by both pediatricians and otolaryngologists. As generally described in scientific literature, and also in our experience, injuries due to the FB insertion usually concern toddlers and preschoolers, while older children less often demonstrate risky behaviors such as placing foreign objects in their ears[8]. Unilateral FBs more frequently affect the right side than the left, due to a preference of right-handed individuals to insert objects in their right ear[9].

A FB in the ear may result in significant morbidity because of the small anatomic size and delicate skin of the EAC and the thinness of the tympanic membrane[4,5,10]. Children with aural FBs can have a variety of presentations, and otalgia is a not an unusual symptom[4]. The EAC in fact is rich in sensitive innervations supplied by fibers derived by the vagus (nerve of Arnold), by the auricular-temporal branch of the mandibular nerve (3rd branch of the trigeminal nerve) and by a small contingent of fibers derived from the facial nerve. The innervations explain the exquisite sensitivity of these structures and the severe pain experienced by patients, which attempts of removal could even exacerbate[5]. In our experiences, the majority of cases were clinically silent; pain was reported by only some 6% of patients. Silent cases could pose a diagnostic problem. However, as the insertion of the FB is frequently witnessed, diagnosis is not delayed and physicians readily remove these objects without serious consequences.

However, long-standing or hazardous FBs can cause extensive damage. Some objects, because of their composition, contour, or location, are particularly hazardous. For instance, objects with sharp edges pose a significant risk of tympanic membrane perforation or canal laceration if not treated properly. Some authors argue that complications are directly related to frustrated attempts to remove the FB and not to the time in which it stays in the ear[2]. Therefore, in the scientific literature, it is frequently recommended that the FB removal be performed by trained personnel so as to avoid complications[2]. In our case series, no complications were recorded; this positive result could be a consequence of both a timely intervention and a removal performed by adopting the appropriate techniques.

Despite the fact that no adverse consequences were observed in our case series, some critical points need to be stressed. First, the retrieved FBs are objects usually available at home such as pins and seeds, while fragments of toys were found in only 2 cases. These findings seem to testify to the efficacy of regulations imposing manufacturing quality standards on toys. Injuries due to small parts have become a matter of interest in the last 30 years, focusing on the relationship between a proper prevention and the diminished frequency of occurrences. The SPTF (Small Part Test Fixture) is at the moment the most common test used to define which objects might lead to injuries and which can be labeled as safe. However, this issue remains problematic. This regulation in fact covers products for children under three. A wide range of objects easily accessed by children even if not expressly designed for them are exempt, including objects (such as books and stationary items) that cannot be manufactured in a way that would prevent them from breaking into small parts, and objects that need to be small (such as buttons) to perform their intended purpose[11,12]. This fact implies that parents need to be aware of the FB insertion risk and avoid giving fragile or small objects to very young children. However, in our experience, injuries usually happen while under adult supervision, while children are manipulating objects not conceived for their use and not adapted for their age. Therefore, the implementation of educational strategies regarding safe behaviors could be fundamental

in preventing injuries and need to be promoted by health practitioners.

Unfortunately, clinicians and researchers also seem to pay little attention to this topic. Generally, case series reviews and meta-analytic studies are considered as fundamental in order to identify and describe the injury dynamics and to orient therapeutic and preventive approaches. However, not only are case series reporting FBs in the ears relatively rare in the scientific literature, data regarding the dynamics of the accident and clinical features are not reported in a standardized way, frustrating any attempt to synthesize the existing knowledge. As a result, the adoption of national or international surveillance systems[13] seems to be necessary in order to collect the information in a standardized way and to identify which objects, products and behaviors could be dangerous for children.

REFERENCES

1. Gregori D, Morra B, Berchialla P, et al. Foreign bodies in the ears causing complications and requiring hospitalization in children 0-14 age: results from the ESFBI study. Auris Nasus Larynx 2009; 36: 7-14.
2. Balbani AP, Sanchez TG, Butugan O, et al. Ear and nose foreign body removal in children. Int J Pediatr Otorhinolaryngol 1998; 46: 37-42.
3. Bressler K, Shelton C. Ear foreign-body removal: a review of 98 consecutive cases. Laryngoscope 1993; 103: 367-370.
4. Ansley JF, Cunningham MJ. Treatment of aural foreign bodies in children. Pediatrics 1998; 101: 638-641.
5. Schulze SL, Kerschner J, Beste D. Pediatric external auditory canal foreign bodies: a review of 698 cases. Otolaryngol Head Neck Surg 2002; 127: 73-78.
6. Ijaduola GT, Okeowo PA. Foreign body in the ear and its importance: the Nigerian experience. J Trop Pediatr 1986; 32: 4-6.
7. Das SK. Aetiological evaluation of foreign bodies in the ear and nose. J Laryngol Otol 1984; 98: 989-991.
8. Brown L, Tomasi A, Salcedo G. An attractive approach to magnets adherent across the nasal septum. CJEM 2003; 5: 356-358.

Table II. Comparison Among Characteristics Recorded in the Present Case Series and in 4 Published Case Series

	First author, publication year, country, number of retrieved FBs				
	Buenos Aires 2009, Argentina, 392 FB	Gregori[1] 2009, Europe, 498 FB	Schulze[5] 2002, US, 698 FB	Ijaduola[6] 1986 Nigeria, 400 FB	Das[7] 1984, India 233 FB
Distribution by sex					
Males	50.5	59	52		60.9
Females	49.5	41	48		39.1
Distribution by age					
0-3 yrs	9.4	12			58.37
> 3 yrs	90.6	88			41.63
FB type					
Organic FB	34.2	22.8			
Inorganic FB	65.8	77.2			
Adult present					
Yes	83.7	32			
No	16.3	68			
Location					
Right	52.6				
Left	47.4				
Bilateral					
Most frequent symptom	Hypoacousia (10.9)				
Most frequent complication	No complications observed	Lesion of auricular canal, perforation of tympanic membrane, local inflammation	Otitis media, lesion of auricular canal	Tympanic membrane perforation	Otitis externa

Data are given as percentages.

9. Peridis S, Athanasopoulos I, Salamoura M, Parpounas K, Koudoumnakis E, Economides J. Foreign bodies of the ear and nose in children and its correlation with right or left handed children. Int J Pediatr Otorhinolaryngol 2009; 73: 205-208.
10. Brown L, Denmark TK, Wittlake WA, Vargas EJ, Watson T, Crabb JW. Procedural sedation use in the ED: management of pediatric ear and nose foreign bodies. Am J Emerg Med 2004; 22: 310-314.
11. Milkovich SM, Altkorn R, Chen X, et al. Development of the small parts cylinder: lessons learned. Laryngoscope 2008; 118: 2082-2086.
12. Milkovich SM, Rider G, Greaves D, Stool D, Chen X. Application of data for prevention of foreign body injury in children. Int J Pediatr Otorhinolaryngol 2003; 67 (Suppl): S193-196.
13. Gregori D. The Susy Safe Project. A web-based registry of foreign bodies injuries in children. Int J Pediatr Otorhinolaryngol 2006; 70: 1663-1664.