



## Foreign bodies of the ear and nose in children and its correlation with right or left handed children

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### KEYWORDS

Foreign body;  
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### Summary

**Objective:** Foreign bodies (FB) of the ear and nose are common findings in the pediatric population. The objective of this project is to present our experience of cases presented to our department and to correlate the insertion of the FB in relation to the child's handedness.

**Methods:** This project was carried out at the Department of Otorhinolaryngology Head and Neck Surgery of "Aghia Sophia" Children's Hospital (Athens, Greece), between December 2007 and August 2008. Data collected includes age and sex of the child, time elapsed between the insertion of the FB and its removal, type of FB, site of insertion, description of the child's handedness, conditions of removal and complications.

**Results:** 46 FB were removed from the nasal cavities. On the right nasal cavity, 29/31 (93.55%) children were right handed and 2/31 (6.45%) were left handed. On the left nasal cavity, 11/14 (78.57%) were right handed and 3/14 (21.43%) children were left handed. One right handed child had a FB in both nasal cavities. 44 FB were removed from the ear (external auditory canal: EAC), 30 (68.18%) from the right EAC and 14 (31.82%) from the left. On the right EAC, 28/30 (93.33%) children were right handed and 2/30 (6.67%) were left handed. Children with FB of the left EAC were 9/14 (64.29%) right handed and 5/14 (35.71%) left handed.

**Conclusions:** Children insert FB into their nasal cavities randomly ( $P = 0.308$ ). As a result, there is no correlation with the child's handedness and right/left nasal cavities FB insertion. On the other hand, children do insert FB into their right/left EAC according whether they are right/left handed ( $P = 0.014$ ). Consequently, right handed children insert FB into their right EAC and left handed children into their left EAC.

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## 1. Introduction

Foreign bodies (FB) of the ear and nose are common findings in the pediatric population being referred to the ear, nose and throat (ENT) emergency department (ED). Several articles have been published in the otolaryngology and pediatric literature describing FB of the ear and nose and their management. The objective of this study is to present our experience of cases presented to our department. This is the first project that studies the correlation of the foreign's body insertion in relation to the child's handedness (right handed or left handed).

## 2. Methods

This project is a retrospective study of children with FB of the ear and nose being examined at the Department of Otorhinolaryngology Head and Neck Surgery of "Aghia Sophia" Children's Hospital, a tertiary care pediatric hospital in Athens (Greece), between December 2007 and August 2008. Patients (right or left handed) are included till the age of 14, having a FB of the external auditory canal (EAC) or nasal cavity being inserted by the same child. Patients are excluded when the FB has not been inserted by the child itself, when the parents are not certain whether their child is right or left handed and if the child is both right handed and left handed. Data collected at the ED by the otolaryngologist includes age and sex of the child, time elapsed between the insertion of the FB and its removal, type of FB, site of insertion (describing whether the FB is in the right/left/both EAC and right/left/both nasal cavities), description if the child is right handed or left handed, conditions of removal (ED or operation theatre under general anesthesia) and complications.

Instruments used for removal included alligator forceps, plain forceps, right angle ball hook and suction (Schuknecht).

All statistical analysis was carried out with the Statistical Package for Social Sciences (SPSS Version 16.0, Chicago, IL). Data were analyzed using Chi-square ( $\chi^2$ ) test for categorical variables. Results were considered statistically significant if the *P* value was equal or less than 0.05.

## 3. Results

Of 91 young patients, 90 fulfilled the inclusion criteria. 41 (45.56%) children were male and 49 (54.44%) were female, with ages ranging between

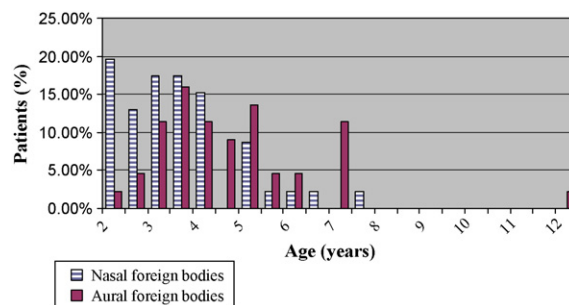


Fig. 1 Age distribution of children with nasal and aural foreign bodies.

2 and 12 years (mean 3.99 years). 1 patient, age 19 months, was not included in this paper because the FB in her right ear (piece of thermometer causing tympanic membrane perforation) was inserted by her older brother. 78/90 (86.67%) patients were right handed and 12/90 (13.33%) were left handed. The proportion of right to left handers in the population is  $\sim 90\%$  and  $\sim 10\%$ , respectively [1]. In our study, the highest incidence for nasal FB is 2–4 years (82.61%), whereas in aural FB the highest frequency is between the ages 3–5 (61.36%) and 3–7 (81.82%) (Fig. 1).

46 FB were removed from the nasal cavities, 31 (67.39%) from the right nasal cavity, 14 (30.43%) from the left nasal cavity and 1 (2.17%) from both nasal cavities. On the right nasal cavity, 29/31 (93.55%) children were right handed and 2/31 (6.45%) were left handed. On the left nasal cavity, 11/14 (78.57%) were right handed and 3/14 (21.43%) children were left handed. One right handed child had a FB in both nasal cavities (Fig. 2). All of the nasal FB were removed at the ED by an otolaryngologist.

44 FB were removed from the EAC, 30 (68.18%) from the right EAC and 14 (31.82%) from the left. On the right EAC, 28/30 (93.33%) children were right

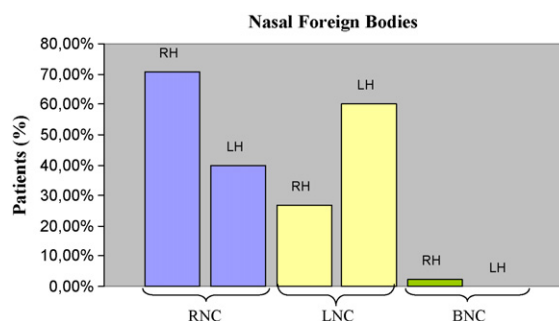
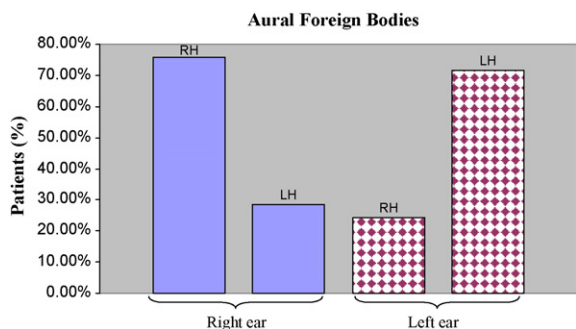


Fig. 2 Correlation of nasal cavity foreign body insertion and right/left handed children (RH: right handed, LH: left handed, RNC: right nasal cavity, LNC: left nasal cavity, BNC: both nasal cavities).



**Fig. 3** Correlation of aural foreign body insertion and right/left handed children (RH: right handed, LH: left handed).

handed and 2/30 (6.67%) were left handed. Children with FB of the left EAC were 9/14 (64.29%) right handed and 5/14 (35.71%) left handed (Fig. 3). 32/44 children had the FB removed at the ED, and 9/44 at the operation theatre under general anesthesia using a surgical microscope.

Chi-squared analysis showed that children insert FB into their nasal cavities randomly ( $P = 0.308$ ). As a result, there is no correlation whether the child is right/left handed and right/left nasal cavities (Table 1). On the other hand, children do insert FB into their right/left EAC according whether they are right/left handed ( $P = 0.014$ ). Consequently, right handed children insert FB into their right EAC and left handed children into their left EAC (Table 2).

Main types of nasal FB are plastic toys (26.09%), beads (17.39%), plastic balls (15.22%) and paper (13.04%) among others. On the other hand, the aural main types of FB are beads (25%), plastic toys (13.64%), grain/seeds (13.64%) and stones (11.36%) among others.

Complications of the FB of the nose and ear included: trauma of the mucosa of the nasal cavity (mainly the inferior concha and nasal septum) and EAC either caused during the insertion of the FB by the child or during the removal procedure; septal ulceration; hemorrhage from the nose (epistaxis) or the EAC; unilateral nasal occlusion with unilateral mucopurulent nasal discharge with foul odor.

**Table 1** Chi-square ( $\chi^2$ ) analysis of nasal foreign bodies (d.f.: degrees of freedom, Asymp: asymptotic, sig: significance level).

Chi-square tests			
	Value	d.f.	Asymp. sig. (2-sided)
Pearson Chi-square	2.358	2	$P = 0.308$
Likelihood ratio	2.248	2	$P = 0.325$
No. of valid cases	46		

#### 4. Discussion

Child hand's use preference starts at the age of 5 months and is more space dependent rather than object dependent. At the age of 14–25 months is more consistent, which is a developmental precursor of adult handedness. We believe that the statistical significance related with insertion of aural FB and handedness is due to the midline crossing, which is the extent by which the infant and child is capable of reaching across the body midline. This requires the inhibition of reach with the ipsilateral hand, followed by a categorical contralateral effort. Even in adults reaching across the midline is slower and less accurate than ipsilateral reaching [2,3]. On the other hand, FB insertion at the nasal cavities does not produce a midline crossing effort for the child. Although there is a percentage difference between nasal cavity FB insertion and handedness, there is no statistical significance.

Young children insert FB into their ears and noses, usually with objects found at home [4]. Patients (brought by their parents or attendants) presented to the ED after (a) referring to their parents the insertion of the FB (either by mentioning the action itself or by telling that they feel pain in their ear or nose), (b) when the parents saw the introduction of the FB into their ears or nose and (c) when there is a complication, e.g. hemorrhage from nose or ear, or after a unilateral nasal mucopurulent discharge. Any patient with unilateral nasal discharge should raise the suspicion of a nasal FB and this must be regarded until proved the opposite [5]. It has to be mentioned that 2 right handed children with a FB on their left ears

**Table 2** Chi-square ( $\chi^2$ ) analysis of aural foreign bodies (d.f.: degrees of freedom, Asymp: asymptotic, sig: significance level).

Chi-square tests					
	Value	d.f.	Asymp. sig. (2-sided)	Exact sig. (2-sided)	Exact sig. (1-sided)
Pearson Chi-square	6.020	1	$P = 0.014$		
Continuity correction	4.045	1	$P = 0.044$		
Likelihood ratio	5.613	1	$P = 0.018$		
Fisher's exact test				0.025	0.025
No. of valid cases	44				

had (a) external otitis (came to the ED within 2 h) and (b) acute otitis media (came to the ED after 48 h), suggesting that the insertion was because the discomfort caused by the acute inflammation. Many foreign bodies in the ear and nose are associated with some pre-existing disease of the part concerned, all of them causing irritation, which induces scratching. To allay the irritation, children presumably try to scratch the part with objects held in their fingers [6]. It has been suggested that the longer a FB is lodged in the external acoustic meatus, the more likely an inflammatory response may occur with consequent edema and narrowing of the canal, making removal more difficult [7,8]. Our data and cases fail to support this.

Different techniques have been indicated for the removal of FB [9,10]. In our cases, the use of the alligator forceps, plain forceps, suction and right angle ball hook were sufficient for a successful FB removal either at the ED or at the operation theatre under general anesthesia. Main causes of FB removal under general anesthesia were irregular size and shape of the FB, hemorrhage and/or trauma of the EAC and previous failed attempts of removal either at the ED or from non-trained physicians in primary health centers. Repeated attempts to remove a FB from the ear may cause trauma to the external ear canal resulting in pain, bleeding and edema of the external canal making subsequent attempts more difficult [11]. Success in removing a FB from the nose and external acoustic meatus depends on the type, size and texture of the FB, the cooperation of the patient, type of instrument used and the experience and skills of the professional attempting the removal [12,13].

### Conflict of interest

We declare that we have no conflict of interest.

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