J Arch Mil Med. 2024 March; 12(1): e144148 https://doi.org/10.5812/jamm-144148

Published Online: 2024 August 27 **Research Article**

Epidemiological Investigation of the Foreign Body in the Ear, How to Treat It and Its Complications in the Hospital Kamkar-Arabnia in Qom in 2019

Saeed Abbasi [1], Shirin Shekar Zadeh [1], Amir Hemta [1], Narges Alizadeh [1,*]

[1] Qom University of Medical Sciences, Qom, Iran

[*] ***Corresponding Author:*** Qom University of Medical Sciences, Qom, Iran. Email: narali1360@gmail.com

Received: 9 January, 2024; **Accepted:** 5 August, 2024

Abstract

Background: A foreign object in the ear is a relatively common emergency, and failure to remove it properly or using incorrect methods can cause irreparable damage.

Objectives: This study aimed to investigate the epidemiology of foreign bodies in the ear, their treatment, and associated complications at Kamkar-Arabnia Hospital in Qom in 2019.

Methods: This descriptive study used a census method to include 102 patients referred to Kamkar-Arabnia Hospital with complaints of foreign bodies in the ear. Data were collected using a checklist that included demographic and hospital information, and then analyzed using SPSS 18 with descriptive and analytical statistics.

Results: The study included 102 participants with an average age of 12.41 ± 7.11 years. Most participants were male (58.9%, n = 60), and the age distribution was as follows: 0 - 6 years (49%, n = 50), 6 - 12 years (30.4%, n = 31), 12-18 years (13.7%, n = 14), and over 18 years (6.9%, n = 7). The most common foreign body was seeds (35.2%, n = 36). Complications were observed in 41.4% of cases, with the majority occurring in the age group of 0-6 years. In this age group, seeds were the most common foreign body, whereas in the age groups 6 - 12 years and 12 - 18 years, seeds were also prevalent. For individuals over 18 years, common foreign bodies included matchsticks, cotton, and plastic. Only 22 patients required anesthesia for removal. Among the age groups 0 - 6, 6 - 12, and 12 - 18 years, most foreign bodies were removed without complications, whereas 5 individuals over 18 years experienced canal bleeding.

Conclusions: The study highlights the need for effective preventive measures to avoid the entry of foreign substances in children, emphasizing the importance of proper management to prevent complications.

Keywords: Ear, Treatment, Hospital, Emergency

1. Background

The presence of foreign bodies in the ear is a significant and critical emergency in the emergency department, with an estimated 11% of cases seen in ENT services involving foreign objects. Severe complications occur in approximately 22% of these cases, highlighting the potential risks associated with foreign bodies (1, 2). Unauthorized attempts to remove such objects can lead to irreparable damage. Research conducted in the United States indicates that children are most commonly affected, often inserting objects into their ears out of curiosity. In contrast, adults typically encounter foreign objects like pieces of cotton or matchsticks. Children may insert foreign bodies into the ear canal due to curiosity or improper ear-cleaning habits using tools like ear cleaners. Foreign bodies can be classified into metallic and non-metallic, simple and non-simple, or soft and hard. The removal methods vary based on the type of foreign body, its location, and the patient's cooperation (3, 4).

Materials that people have access to, whether edible or non-edible, can enter the ear, be swallowed, or become lodged in the airways. The size, shape, and consistency of these materials are crucial in determining the risk of mortality or complications due to airway obstruction. A foreign object in the nose may remain there for an extended period, leading to

symptoms such as unilateral nasal obstruction, chronic and worsening purulent rhinitis or sinusitis, foul-smelling and unilateral secretions, and frequent nose manipulation by the affected person (5, 6). When a foreign object enters the body, it triggers a reaction that causes swelling, inflammation, and redness. This inflammation can make it more challenging to remove the foreign body, emphasizing the need for prompt removal before a significant inflammatory reaction occurs (7).

A foreign body in the ear can cause damage to the eardrum or middle ear. Symptoms of a foreign body in the ear may include ear pain, eardrum perforation, secretions due to otitis externa, or a feeling of fullness in the ear. Complications of not removing foreign bodies include bleeding and blood clots in the external ear canal (26%), eardrum damage or rupture (7%), severe infections of the external ear, and ultimately, hearing loss (8).

Although removing a foreign body from the ear is a relatively simple procedure, its potential complications necessitate the assistance of an otolaryngologist. The successful removal depends on several factors, including the location of the foreign body, the material involved, the doctor's skill, the available equipment, and the patient's cooperation (9).

Removing foreign bodies from the ear requires sufficient skill and knowledge, as attempts by non-specialists can cause damage to the external ear canal, perforation of the eardrum, or compression of the foreign object at the end of the ear canal. Such complications can exacerbate the patient's problems and make removal more challenging for medical staff.

Different methods are available for the correct removal of foreign bodies, and the choice of method should be at the discretion of the specialist. The most common approach involves using forceps and local anesthesia, which is effective when the foreign body has not penetrated deeply into the ear canal. Other methods include the use of syringes and warm water to remove deep-seated objects, provided there is no damage to the canal or eardrum and no bleeding from the ear (10). Surgery may be necessary when the foreign body is lodged at the end of the ear canal and cannot be removed by non-invasive methods. In cases where the patient does not cooperate despite all efforts, general anesthesia may be required, particularly in children (11).

2. Objectives

The main purpose of this research is to determine the types of foreign bodies, age distribution, and potential risks associated with improper removal or non-removal. Given the serious dangers posed by these foreign objects and the lack of similar research in Qom city, a detailed investigation is warranted.

3. Methods

This descriptive and cross-sectional study was conducted in 2019 using a census method on patients referred to Kamkar-Arabnia Hospital of Qom University of Medical Sciences. Initially, a set of inclusion and exclusion criteria were established. The inclusion criteria were: (1) the patient's file is complete; and (2) the patient presented to the hospital with a complaint of a foreign body in the ear. The exclusion criteria were: The patient's file is incomplete or illegible.

Data were collected using a checklist that included information on age, sex, type of foreign body, method of removal, and complications caused by the foreign body. This data was extracted from the patient's file, entered into SPSS 18, and analyzed using descriptive statistics, including prevalence, percentage, standard deviation, and mean.

4. Results

In this study, the results indicated that a total of 102 people participated, with an average age of 7.11 ± 12.41 years. Most participants were male (58.9%, n = 60), and the age group of 0 - 6 years comprised 49% (n = 50) of the participants (Table 1). The majority of foreign bodies were seeds (35.2%, n = 36), edible seeds (24.6%, n = 25), and matchsticks, cotton, and plastic (18.8%, n = 19) respectively (Table 2). In terms of complications, most individuals experienced no complications (58.6%, n = 65), followed by ear canal scratching (19.8%, n = 22) and ear canal bleeding (12.6%, n = 14) respectively (Table 3).

Table 1. Demographic Characteristics of People Participating in the Study

Variables	No. (%)
Gender	
Female	42 (41.1)
Man	60 (58.9)
Age category	
0 - 6	50 (49)
6 - 12	32 (31.4)
12 - 18	8 (7.8)
Over 18 years	12 (11.8)

Table 2. Frequency Distribution of Examined Samples According to the Type of Foreign Body

Type of Foreign Body	No. (%)	
Seeds (beads, beads, rosary seeds, pearls, etc.)	36	(35.2)
Edible seeds (legumes, beans, lentils, etc.)	25	(24.6)

Type of Foreign Body	No. (%)
Insects (all insects)	16 (15.6)
Matchstick, cotton, plastic and...	19 (18.8)
Others (batteries, doll accessories, soap, pencil tips, etc.)	6 (5.8)

Table 3. Frequency Distribution of Examined Samples According to Complications

Complications	No. (%)
No complications	65 (58.6)
Scratching the ear canal	22 (19.8)
Ear canal bleeding	14 (12.6)
Perforation of the eardrum	7 (6.3)
Otitis	3 (2.7)
Total complications	111 (100)

In this section, the results indicated that in the age group of 0 - 6 years, most foreign bodies were seeds. In the 6-12-year age group, seeds were also common, with 9 cases, while in the 12-18-year age group, 5 cases involved seeds. For individuals over 18 years old, most foreign bodies were matchsticks, cotton, and plastic (Table 4). Additionally, only 22 patients required anesthesia for the removal of the foreign body (Table 5). In the age groups of 0 - 6, 6 - 12, and 12 - 18 years, the majority of foreign bodies were removed without complications. However, 5 individuals over 18 years old experienced ear canal bleeding.

5. Discussion

This study aimed to conduct an epidemiological investigation of foreign bodies in the ear, as well as their treatment and complications, at Kamkar-Arabnia Hospital in Qom in 2019. A total of 102 participants were included in the study. According to existing studies, the incidence of foreign bodies in the emergency room ranges between 1 - 3%, highlighting its importance as a critical issue that sometimes requires prompt intervention (12, 13).

The results of this study showed that the average age of the participants was 12.41 ± 7.11 years. Most participants were male and in the age group of 0 - 6 years. The most common foreign bodies were seeds, edible seeds, matchsticks, cotton, and plastic, respectively. In terms of complications, most participants experienced no complications, while others had ear canal scratches or bleeding. A study found that more than 50.1% of patients were 8 years old or younger, with a predominance of males. In adults, foreign bodies in the ear were often self-inflicted due to personal needs (13). Similarly, a study by Hashemi et al. reported that most patients were male and under 15 years old (14). These findings align with our study, emphasizing the importance of considering the gender and age of individuals, as young children often insert foreign objects out of curiosity or play, and males might be more frequently affected due to external work environments.

In a study conducted by Mangussi-Gomes et al., it was found that 9.5% of patients required additional tests to detect the foreign body, while 69.4% were identified using a simple CT scan. However, CT scans are not always effective in detecting certain foreign objects, such as fish and chicken bones. Thus, for suspicious cases, further diagnostic measures are necessary, as the types of foreign bodies can vary based on geographical and social characteristics (13). For instance, in developing countries, foreign bodies are often seeds or cotton pieces, while in developed countries, plastic pieces are more common (15, 16).

In this section, the results showed that the primary foreign body in the age groups of 0 - 6, 6 - 12, and 12 - 18 years was seeds, while individuals over 18 years of age more commonly had matchsticks, cotton, and plastic. Only 22 patients required anesthesia for foreign body removal. Additionally, in the age groups of 0 - 6, 6 - 12, and 12 - 18 years, most individuals had the foreign body removed without complications. However, 5 individuals over the age of 18 experienced canal bleeding. In other studies, only a small percentage of patients required anesthesia for foreign body removal, which is consistent with our findings (13). Furthermore, the rate of complications in our study was very low, aligning with similar research (17, 18).

The differences observed across studies in the need for general anesthesia and complication rates may be attributed to the fact that our cases were managed exclusively by otolaryngologists. As specialists in this field, they are adept at handling foreign body cases, thereby reducing the likelihood of complications. It is crucial to follow up with patients, particularly when insects or other foreign objects that do not cause infection are present.

The rapid removal of foreign bodies from the ear using traditional methods poses a significant challenge for otolaryngologists. Treatment success depends on various factors, and there is no conclusive evidence favoring one method over others. However, it is known that the persistence of foreign bodies in the ear, nose, and throat for more than 72 hours, along with repeated removal attempts, increases the risk of complications. Such situations are both unpleasant and unusual, and they significantly diminish the chances of successful removal.

A strength of this study is its focus on an important issue that has not been extensively studied at the

Table 4. Frequency Distribution of Examined Samples According to the Type of Foreign Body in Each age Range

The Age Range (y)	Grains	Edible Seeds	Insects	Matchstick, Cotton, Plastic and...	Other
0 - 6	21	16	5	11	5
6 - 12	9	7	7	1	1
12 - 18	5	1	2	1	0
Over 18	1	1	2	6	0

Table 5. Frequency Distribution of Examined Samples According to Anesthesia or Not

Gender	Perform Anesthesia	Without Anesthesia
Man	13	47
Female	9	33
Total	22	80

university level, particularly concerning certain age groups. A limitation of the study was the presence of incomplete and illegible files. Future research is recommended to involve longer-term studies and interventions, examining how different medical approaches affect the removal of foreign bodies based on the type of foreign material and specific age groups.

5.1. Conclusions

Based on the study results and the complications associated with foreign bodies in the ear, it is essential to develop and implement strategies to prevent the entry of foreign bodies and to plan for their effective removal if necessary.

Footnotes

Authors' Contribution: Study concept and design: S. A. and Sh. Sh. Z.; analysis and interpretation of data: A. H. and N. A.; drafting of the manuscript: A. H.; critical revision of the manuscript for important intellectual content: N. A., S. A., and A. H.; statistical analysis: N. A.

Conflict of Interests Statement: There is no conflict of interest among the authors of the article.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

Ethical Approval: IR.MUQ.REC.1400.123 .

Funding/Support: Authors declared no funding support.

Informed Consent: Informed consent was obtained from the participants.

References

1. Silva BSR, Souza LO, Camera MG, Tamiso GB, Castanheira LVR. Foreign Bodies in Otorhinolaryngology: A Study of 128 Cases. *Int Arch Otorhinolaryngol*. 2009;**13**(4):394-9.
2. Olajuyin O, Olatunya OS. Aural foreign body extraction in children: a double-edged sword. *Pan Afr Med J*. 2015;**20**:186. [PubMed ID: 26430483]. [PubMed Central ID: PMC4577626]. https://doi.org/10.11604/pamj.2015.20.186.5218.
3. Morris S, Osborne MS, McDermott AL. Will children ever learn? Removal of nasal and aural foreign bodies: a study of hospital episode statistics. *Ann R Coll Surg Engl*. 2018;**100**(8):1-3. [PubMed ID: 29968507]. [PubMed Central ID: PMC6204523]. https://doi.org/10.1308/rcsann.2018.0115.
4. Weksler CW, Heiman E, Weiser G. Removal of external auditory canal foreign bodies in the pediatric emergency department - A retrospective comparison study. *Int J Pediatr Otorhinolaryngol*. 2022;**160**:111247. [PubMed ID: 35926383]. https://doi.org/10.1016/j.ijporl.2022.111247.
5. Higuchi O, Adachi Y, Adachi YS, Taneichi H, Ichimaru T, Kawasaki K. Mothers' knowledge about foreign body aspiration in young children. *Int J Pediatr Otorhinolaryngol*. 2013;**77**(1):41-4. [PubMed ID: 23039937]. https://doi.org/10.1016/j.ijporl.2012.09.026.
6. Dabrowska-Bien J, Skarzynski H, Gos E, Gwizdalska I, Lazecka KB, Skarzynski PH. Clinical Evaluation of a Polish Translation and Cross-Cultural Adaptation of the Nasal Obstruction Symptom Evaluation (NOSE) Scale. *Med Sci Monit*. 2018;**24**:7958-64. [PubMed ID: 30399140]. [PubMed Central ID: PMC6238543]. https://doi.org/10.12659/MSM.909934.
7. Anderson C, Stitt R, Roberts J. Foreign body synovitis in the Pacific. *Hawaii J Med Public Health*. 2014;**73**(11 Suppl 2):37-40. [PubMed ID: 25478302]. [PubMed Central ID: PMC4244892].
8. Srinivas Moorthy PN, Srivalli M, Rau GV, Prasanth C. Study on clinical presentation of ear and nose foreign bodies. *Indian J Otolaryngol Head Neck Surg*. 2012;**64**(1):31-5. [PubMed ID: 23458845]. [PubMed Central ID: PMC3244580]. https://doi.org/10.1007/s12070-011-0149-2.
9. Lotterman S, Sohal M. Ear Foreign Body Removal. *StatPearls [Internet]*. Treasure Island, FL: StatPearls Publishing; 2017.

10. Mingo K, Eleff D, Anne S, Osborne K. Pediatric ear foreign body retrieval: A comparison across specialties. *Am J Otolaryngol*. 2020;**41**(2):102167. [PubMed ID: 31405529]. https://doi.org/10.1016/j.amjoto.2019.01.010.
11. Ng TT. Aural foreign body removal: there is no one-size-fits-all method. *Open Access Emerg Med*. 2018;**10**:177-82. [PubMed ID: 30519123]. [PubMed Central ID: PMC6233696]. https://doi.org/10.2147/OAEM.S178850.
12. Ray R, Dutta M, Mukherjee M, Gayen GC. Foreign body in ear, nose and throat: experience in a tertiary hospital. *Indian J Otolaryngol Head Neck Surg*. 2014;**66**(1):13-6. [PubMed ID: 24605294]. [PubMed Central ID: PMC3938699]. https://doi.org/10.1007/s12070-012-0529-2.
13. Mangussi-Gomes J, Andrade JS, Matos RC, Kosugi EM, Penido Nde O. ENT foreign bodies: profile of the cases seen at a tertiary hospital emergency care unit. *Braz J Otorhinolaryngol*. 2013;**79**(6):699-703. [PubMed ID: 24474480]. [PubMed Central ID: PMC9442440]. https://doi.org/10.5935/1808-8694.20130128.
14. Hashemi BS, Gandomi B, Hesamzade L. [Evaluation of the Incidence and Complications of Foreign Body Ingestion in the Patients Referred to Shiraz Khalili Hospital]. *Armaghane Danesh*. 2004;**8**(4):41-9. Persian.
15. Oyama LC. Foreign Bodies of the Ear, Nose and Throat. *Emerg Med Clin North Am*. 2019;**37**(1):121-30. [PubMed ID: 30454775]. https://doi.org/10.1016/j.emc.2018.09.009.
16. Prasad N, Harley E. The aural foreign body space: A review of pediatric ear foreign bodies and a management paradigm. *Int J Pediatr Otorhinolaryngol*. 2020;**132**:109871. [PubMed ID: 32050118]. https://doi.org/10.1016/j.ijporl.2020.109871.
17. Sabarigirish K, Nithya V, Saxena S, Dutta A. Nasal myiasis by Chrysomya bezziana. *Med J Armed Forces India*. 2018;**74**(1):82-4. [PubMed ID: 29386739]. [PubMed Central ID: PMC5771757]. https://doi.org/10.1016/j.mjafi.2016.09.011.
18. Kim KH, Chung JH, Byun H, Zheng T, Jeong JH, Lee SH. Clinical Characteristics of External Auditory Canal Foreign Bodies in Children and Adolescents. *Ear Nose Throat J*. 2020;**99**(10):648-53. [PubMed ID: 31814447]. https://doi.org/10.1177/0145561319893164.