

Otolaryngological foreign bodies in a tertiary medical center in Turkey: A comparison of pediatric and adult patients

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Abstract

Aim: The aim of the present research was to report on the characteristics of ear, nose, and throat foreign bodies in patients admitted to a tertiary medical center in Turkey and to analyze the extraction procedure, results, and complications.

Material and Methods: A retrospective study conducted between August 2015 and May 2019 included 1042 patients referred to the emergency and otolaryngology department with ear, nose, and throat foreign bodies. The pediatric group included 612 cases, while the adult group included 430 cases. Sex, the type of foreign bodies, symptoms, extraction method, and complications were analyzed.

Results: The most common foreign bodies were hard round objects frequently found in front of the middle turbine in the nose of children, while pieces of cotton buds were found in the outer ear canal in adults. In the pediatric group, the distribution of foreign bodies was 53.43% in boys and 46.57% in girls. Furthermore, the intervention was performed in three children (0.49%) admitted to the emergency department because of the organic foreign body escaping to the throat, as a result of which foreign bodies were removed. However, the prognosis for these patients was poor: a neurological sequela in one patient, death in two patients. In the adult group, the distribution of foreign bodies was 49.76% in males and 50.24% in females. No fatal cases were observed in this group. The ratio of foreign bodies removed under general anesthesia in the pediatric group was 3.43%, while it was 0.23% in the adult group, and the difference between them was statistically significant ($p = 0.018$). No statistical difference was observed between the groups with regard to complication rates ($p > 0.05$).

Conclusion: Otolaryngological foreign bodies are usually harmless, but they can cause infections and minor complications when they are overlooked or there is prolonged exposure, and these objects in the throat may be fatal, especially in children.

Keywords: Otolaryngology; foreign bodies; child; adult.

INTRODUCTION

Ear, nose, and throat (ENT) foreign bodies (FBs) are frequently encountered by emergency physicians and ENT specialists, but sometimes these objects can cause life-threatening conditions (1,2). While the initial symptoms for ear FBs may be hypoacusis, otorrhagia, and otorrhea, these symptoms for nasal FBs may be sneezing, nasal obstruction, and smelling purulent rhinorrhea. Odynophagia is the main symptom in pharyngeal FBs (3). Although FBs in the ear are usually less harmful than those in the pharynx and cause pain, local infections, and injury to the tympanic membrane, FBs in the nose and pharynx may cause life-threatening conditions such as airway obstruction or upper gastrointestinal tract perforation by falling into the esophagus or trachea and bronchi (4-6).

The morbidity for these FBs varies between 10% and 20% around the world, and the situation in question accounts for about 7% of accidental deaths in children under the age of 4 in the United States (4,7).

Previous research has identified various foreign bodies in the ENT region. These objects may be inorganic or organic products, including toy parts, food particles, beads, wood, seeds, buttons, battery cells, and stones (6,8). Imaging may not always be helpful in diagnosing FBs in the ENT region. Especially in pediatric patients, it is important to provide appropriate clinical conditions for both anatomy and removal of FBs to avoid additional complications. Although there are no standard methods for the removal of FBs, extraction is usually performed under local anesthesia using irrigation, suction, and/or forceps (8).

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The aim of the present retrospective study was to investigate ENT FBs in detail in pediatric and adult patients, to analyze the complications, and to review the treatment modalities.

MATERIAL and METHODS

In this clinical, retrospective study, 1042 patients admitted to the emergency and otorhinolaryngology department with foreign objects detected in the ear, nose, or throat between August 2015 and May 2019 were included. Moreover, accidentally found foreign bodies on ENT examination, even when the history was not presented, were also included in our study. Of these cases, 84 adult patients with throat FBs (mean age 58 years; range 18-98 years; 48 males and 62 females), 305 adult patients with ear FBs (mean age 63 years; range 18-101 years; 154 males and 138 females), 41 adult patients with nasal FBs (mean age 49 years; range 18-83 years; 12 males and 16 females), 23 pediatric patients with throat FBs (mean age 8 years; range 0-18 years; 10 males and 13 females), 221 pediatric patients with ear FBs (mean age 6 years; range 0-18 years; 127 males and 94 females), and 368 pediatric patients with nasal FBs (mean age 4 years; range 0-18 years; 190 males and 178 females) were enrolled in the research. Patients who were admitted to the hospital on suspicion of foreign objects, but in whom foreign objects were not detected in the ENT area after a detailed examination were excluded from the study. The primary clinical evaluation and the extraction procedure of FBs were performed by an emergency medicine specialist or ENT specialist in our medical center. Various instruments and methods such as a curette, crocodile forceps, ear syringe, and irrigation were utilized for the removal of foreign bodies from the ear, sometimes with the help of a microscope. The following instruments were utilized for the removal of nasal FBs: bayonet forceps, curette, or alligator forceps. At all times under local anesthesia with 10% lidocaine, some instruments such as bayonet forceps, Fraenkel laryngeal forceps, or Hartmann forceps were used for the removal of pharyngeal FBs.

General anesthesia was needed in 21 children and only one adult case to remove FBs. The study variables comprised symptoms, foreign body types, hospitalization and general anesthesia ratio, the means of extraction, and complications.

Approval for the present research was obtained from the local ethics committee (IRB Number: 2018-230).

Statistical analysis

Data analysis was performed using SPSS software for Windows (SPSS Inc., Chicago, IL). The results were given as mean \pm standard deviation, median (min-max), and percentage. The Kolmogorov-Smirnov normality test was conducted to confirm abnormal data distribution. To compare the foreign body incidence rates between the groups, the Mann-Whitney U test was conducted. The chi-square test was used for the purpose of comparing

the hospitalization rates, general anesthesia requirement rates, and complication rates. Results for $p < 0.05$ were accepted as statistically significant.

RESULTS

Four hundred thirty adult patients and 612 pediatric patients with foreign bodies detected in the ENT area were eligible for the study. In the pediatric group, 327 cases were male (53.43%) and 285 cases were female (46.57%), while in the adult group, 214 cases were male (49.76%) and 216 cases were female (50.24%). The most common complaints were nasal congestion, epistaxis, and purulent discharge for nasal foreign bodies, while otalgia, hearing loss, and bleeding from the ear were the most common complaints for ear foreign bodies, and dysphagia, throat pain, and sensation of FBs inside the throat were the most common complaints for throat foreign bodies.

Table 1. Distribution of ENT FBs between groups

Region	Type of Foreign Body	Frequency-Children	Frequency-Adult	P Value
Ear	Cotton	42	178	P= 0.001
	Beads	62	8	P= 0.019
	Toy Pieces	58	2	P= 0.017
	Hair	10	47	P= 0.022
	Silicone	5	38	P= 0.014
	Plastic	9	7	P>0.05
	Pencil	8	5	P>0.05
	Paper	9	8	P>0.05
	Insect	3	4	P>0.05
	Beans or Seeds	9	4	P>0.05
	Popcorn	6	3	P>0.05
	Toy Pieces	78	-	-
	Beads	67	6	P= 0.012
	Beans or Seeds	59	4	P= 0.019
Nose	Gauze	27	13	P>0.05
	Paper	58	8	P= 0.022
	Sponge	41	8	P= 0.038
	Popcorn	38	2	P= 0.033
	Fish Bone	10	62	P= 0.02
Throat	Chicken Bone	4	6	P>0.05
	Popcorn	6	6	P>0.05
	Green plum	2	5	P>0.05
	Hazelnut	1	5	P>0.05

Mann Whitney- U test, < 0.05 statistically significant differences between the groups

In the pediatric group, of a total of 612 patients, 221 (36.1%) had ear FBs, 368 (60.1%) had nasal FBs, and 23 (3.8%) had throat FBs with a mean age of 4 years (range: 1-18 years). Of ear FBs, 142 (64.2%) were in the right ear, and 79 (35.8%) were in the left ear. The first three most common FBs in the ear were beads in 62 patients (28%), toy pieces in 58 patients (26%), and cotton in 42 patients (19%), respectively. Nasal FBs were found most frequently in children aged 3-7 years, accounting for 47% of the total cases.

Of the FBs detected in the nose, 269 (73.1%) were in the right nasal space, and 99 (26.9%) were in the left nasal

space. The first three most common FBs in the nose were toy pieces in 78 patients (21%), beads in 67 patients (18%), and beans or seeds in 59 patients (16%), respectively. Of the 23 throat FB cases in children, 7 (30.43%) were in the right tonsil, 6 (26.08%) were in the left tonsil, 7 (30.43%) were at the base of the tongue, and 3 (13.04%) in the supraglottic area. The first three most common FBs in the throat were fishbone in 10 patients (43.47%), popcorn in 6 patients (26.08%), and green plum in 2 patients (8.69%). The distribution of ENT FBs between the groups is shown in Table 1.

Site	Children group	Adult group	P value
Ear	221 (36.1%)	305 (70.9%)	0.022
Nose	368 (60.1%)	41 (9.5%)	0.14
Throat	23 (3.8%)	84 (19.53%)	0.012
Total	612 (100%)	430 (100%)	-

Chi-square test, < 0.05 statistically significant differences between the groups

In the adult group, of a total of 430 patients, 305 (70.9%) had ear FBs, 41 (9.5%) had nasal FBs, and 84 (19.53%) had throat FBs with a mean age of 58 years (range: 18-83 years). Of ear FBs, 178 (58.4%) were in the right ear, and 127 were (41.6%) in the left ear. The first three most common FBs in the ear were cotton in 168 patients (55%), hair in 47 patients (15.4%), and silicone in 38 patients (12.4%), respectively.

	Children group	Adult group	P value
Hospitalization	14.7% (90/612)	3.2% (14/430)	0.018
Intensive care unit care	0.49% (3/612)	-	-
General anesthesia requirement	3.43% (21/612)	0.23% (1/430)	0.025

Chi-square test, < 0.05 statistically significant differences between the groups

Of the FBs detected in the nose, 19 (46.3%) were in the right nasal space, and 22 (53.7%) were in the left nasal space. The first three most common FBs in the nose were gauze in 13 cases (31.7%), paper in 8 cases (19.5%), and sponge in 8 cases (19.5%), respectively. Of the 84 throat FB cases in adults, 38 (45.2%) were at the base of the tongue, 22 (26.2%) were in the right tonsil, 20 (23.8%) were in the left tonsil, and 4 (4.8%) were in the supraglottic area. The first three most common FBs in the throat were fishbone in 62 patients (73.8%), chicken bone in 6 patients (7.1%), and popcorn in 6 patients (7.1%). Although the number of FBs in the ear ($p = 0.022$) and throat ($p = 0.012$)

was significantly higher in adults, FBs in the nose were significantly more in children ($p = 0.001$). A comparison of the site of FBs between the groups is shown in Table 2.

A total of 104 (9.9%) patients with ENT FBs required hospitalization, of which 14 (3.2%) were in the adult group and 90 (14.7%) were in the pediatric group, and hospitalization rates were significantly higher in the pediatric group ($p = 0.018$). The mean duration of stay in the clinic was 8.0 ± 10.0 days in the pediatric group and 2 ± 1 day in the adult group, and this difference was statistically significant ($p = 0.014$). In the pediatric group, 3.4% of the patients (21/612) were given general anesthesia for the removal of FBs, and 0.49% (3/612) received intensive care unit (ICU) care. In the adult group, 0.23% of the patients (1/430) were given general anesthesia for the removal of FBs, and none of them received ICU care. The ratio of patients requiring general anesthesia was statistically higher in pediatric patients than in adult patients ($p = 0.025$). The comparison of hospitalization, intensive unit care, and general anesthesia requirement rates is presented in Table 3.

Among the groups, a total of 101 complications occurred due to ENT FBs, of which 71 were caused by foreign bodies in the ear: otitis externa (25 patients - 19.8%), tympanic membrane perforation (22 patients - 17.4%), and external meatus laceration (24 patients - 23.76%). Twenty-seven patients had complications due to nasal FBs: acute rhinosinusitis (11 patients - 8.7%), epistaxis (8 patients - 6.3%), rhinolith formation (7 patients - 5.5%), and nasal septum perforation (1 patient - 0.7%). Although no complications were observed in the case of throat foreign bodies in the adult group, one child presented permanent neurological sequelae due to cerebral hypoxia associated with obstructive laryngeal FBs. In the other two children, severe hypoxia was observed due to supraglottic FBs, which caused acute apnoea, and despite the removal of FBs and follow-up in the intensive care unit, both patients died. In the evaluation of complication rates, no statistically significant difference was determined between the groups ($p > 0.05$).

DISCUSSION

This is the first study in the literature that compares ENT FBs, their treatments, and complications in pediatric and adult patients. The current study comprehensively analyzed the basic features, management methods, and complications of ENT FBs in pediatric and adult patients and compared the characteristics of the two groups statistically. Considering that ENT FBs are common clinical conditions, this study provided valuable information to support otolaryngologists in their clinical practice.

In previous studies, ENT FBs constitute 11% of the cases observed in emergency services (9,10). While ENT FBs are generally harmless, they can cause serious complications, especially in the pediatric population (11). In the current

study, we detected more ENT FBs in pediatric patients (58.7%) than in adult patients (41.3%). Furthermore, there was a small difference in favor of male individuals (51.5%), and these findings were consistent with the literature (12). The oral activity is regarded to be the main reason for the frequency of these foreign bodies in children. However, the insertion of FBs by young children due to boredom or mischief and the unhealthy ear and nose cleaning habits of adults can also cause this situation (12,13). In previous studies, FBs in the ear were found to be more frequent than those in the nose and throat (14,15). In accordance with the current literature, when both groups were evaluated, it was found that ear foreign bodies (50.47%) were more frequent than nasal (39.25%) and throat (10.26%) foreign bodies in our study.

In another review, nasal FBs were detected to be more common in children, especially in the 0-3-year age group (84.61%) (3). In consistency with this knowledge, we found that nasal FBs were significantly more in children than in adults ($p = 0.001$). In children with growth and cognitive development, inserting FBs into the nose becomes uncommon, while in adults, it is frequently observed in individuals with psychiatric problems. On the contrary, we determined that pharyngeal FBs were statistically more in adult patients than in pediatric patients ($p = 0.012$), and the majority of these cases were due to fish-eating habits (73.8%). Additionally, more foreign bodies were detected in adults than in children, and the mentioned difference was found to be statistically significant ($p = 0.022$). The majority of this difference was due to the fact that adults tried to clean the ear with a cotton swab (55%).

Immobilization is the most important key for extraction (15). Although this factor is not usually a problem in adults, it is an important condition to deal with in pediatric patients. In line with this situation, we found that hospitalization and general anesthesia requirement rates were significantly lower in adults than in children ($p = 0.018$, $p = 0.025$, respectively). In the adult group, none of the patients received ICU care. However, 3 of our pediatric patients needed ICU care, with a mean length of hospital stay of 28.0 ± 10.0 days. Two of these patients had supraglottic obstruction caused by green plum, and FBs were removed by the ENT specialist in the emergency department. Afterward, these two patients were followed up in the intensive care unit, but both patients died. The other patient had pieces of hazelnut causing tracheal obstruction, and the foreign body was removed by rigid bronchoscopy by a thoracic surgeon under general anesthesia. This patient was discharged with neurological sequelae after his follow-up in the intensive care unit. Only one patient in the adult group needed general anesthesia for the removal of rhinolith formation, and he was discharged with healing after the foreign body was removed.

Complications of ear FBs were observed in 71 patients in both groups (6.81%), which is less than reported in the literature (16). These were otitis externa (25 cases), tympanic membrane perforation (22 cases), and external

meatus laceration (24 cases). In consistency with our findings, Bressler et al. reported that external otitis was the most frequent complication with a 7.1% incidence (15). The complication rate in our study for nasal FBs (2.5%) was similar to other reports in the literature (3), including acute rhinosinusitis (11 cases), epistaxis (8 cases), rhinolith formation (7 cases), and perforation of the nasal septum (1 case). In the adult group, no complications were observed in throat FB cases. In the pediatric group, three cases had severe complications leading to one neurological sequela and two deaths, due to throat FBs. The FBs in these patients were hard and round objects, such as green plums or nuts, and they all lived in rural areas. Therefore, we consider that the education of people and parents living in rural areas should be improved, particularly in relation to objects that can escape into the throats of children.

The main limitation of the present research was a smaller sample size, which led to the lack of generalization. Another limitation was the retrospective nature of the study, which could lead to incorrect or incomplete data records.

CONCLUSION

ENT FBs are very common conditions in the emergency department and clinic and are usually treated without complications. However, even under today's conditions, deaths and serious sequelae are still being observed in ENT FBs. We recommend increasing public health education, particularly in rural areas, on first aid and objects that can escape into the throats.

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Ethical approval: All operations carried out in this study were performed according to the ethical standards of the institutional research committee and the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. The current work does not involve research with animals carried out by any of the authors.

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