


ORIGINAL RESEARCH

The practice of foreign body removal from the ear, nose, and upper esophageal in children in Ethiopia: A retrospective descriptive study

Dereje Zewdu BSc, MSc¹  | Mekete Wondwosen MD² | Mulatu Chufamo MD² |
Shamill Eanga BSc, MSc¹ | Abdisa Aga BSc, MSc³ | Biniam Ewnte MD⁴ |
Metages Hunie BSc, MSc⁵ | Diriba Teshome BSc, MSc⁵

¹Department of Anesthesia, College of Medicine and Health Science, Wolkite University, Wolkite, Ethiopia

²Department of Surgery, College of Medicine and Health Science, Wolkite University, Wolkite, Ethiopia

³Department of Anesthesia, Harar College of Health Science, Harar, Ethiopia

⁴Department of Surgery, College of Medicine and Health Science, Debre Tabor University, Debre Tabor, Ethiopia

⁵Department of Anesthesia, College of Health Science, Debre Tabor University, Debre Tabor, Ethiopia

Correspondence

Dereje Zewdu, Department of Anesthesia, College of Medicine and Health Science, Wolkite University, P.O. Box 07, Wolkite, Ethiopia.

Email: derejzewdu1529@gmail.com

Abstract

Background: Ear, nose, and upper esophageal foreign body (FB) impaction in children is a common emergency in-hospital service. There are no clear guidelines regarding the management of ingested FBs. This study aimed to determine the FB in terms of type, anatomic site, management outcome, and associated complications.

Methods: Retrospective study of children with ear, nose, and upper esophageal FB managed under general anesthesia (GA) at operating room of Wolkite Hospital in the southern part of Ethiopia between January 2019 and February 2021. Data were collected from the medical chart of the patients using a prepared checklist. The parameters included were age, sex, FB anatomic site, type, management outcome, and associated complications related to FB or procedure modalities.

Results: A total of 169 (31.4%) study subjects were required GA for the removal of FBs. The mean age was 4.45 ± 3.20 years. Under 5 years old children comprises 61.5% of total cases. The most common anatomic site of FB impaction was in the ear 97 (57.4%). The most commonly found type of FB was cereals or seeds, which constituted 102 (60.35%). The complication rate was 18.35%. Epistaxis was the commonest complication (6.51%) from the nose while canal abrasion (5.92%) was common from the ear.

Conclusion: Ear, nose, and upper esophageal FBs were found more frequently in younger children. The ear was the most common anatomic site of FB impaction followed by the nose and upper esophageal. The most common type of FB was cereals or seeds.

Level of Evidence: 4.

KEYWORDS

ENT, Ethiopia, foreign body removal

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2021 The Authors. *Laryngoscope Investigative Otolaryngology* published by Wiley Periodicals LLC on behalf of The Triological Society.

1 | INTRODUCTION

Foreign body (FB) impaction into the ear, nose, and upper esophageal are the most frequently encountered in-hospital services and approximately constitutes 11% of all otorhinolaryngology emergencies with a 22% of complication rate.¹⁻⁴ According to literature, young children, particularly under 5 years old, are more exposed to FB aspiration because of multiple reasons: the curiosity to explore orifices, imitation, playing, and attention deficit hyperactivity disorder along with readily available objects, and lack of attention given by caregivers.⁵⁻⁸

The nature of impacted FB might be organic or inorganic with a wide difference in terms of size, shape, and composition from country to country.^{5,9-11} The anatomic site of FB impaction is variable. In the majority of the cases, FB lodged to the ear is frequent. Despite this, delayed diagnosis and management of FB may cause serious complications especially in the hands of non-otolaryngologists.¹²⁻¹⁵

In the developed world, there are well-established management protocols, trained ENT specialists, and well-equipped settings. In a resource-limited setting, the lack of such standards makes it challenging.¹⁶⁻¹⁹

In third-world countries like Ethiopia, the morbidity associated with impaction of FB in the ear, nose, and upper esophageal remains a significant problem due to different factors. Almost no work has been done on this public issue in our local setting. This retrospective study was conducted to determine the FB in terms of type, anatomic site, management outcome, and associated complication.

2 | METHODS

2.1 | Study setting

A hospital-based retrospective descriptive study was conducted from January 2019 to February 2021 at Wolkite University Teaching Specialized Hospital. The hospital is found in the Gurage Zone of the south nation and nationality of Ethiopia, about 150 km away from the capital city, Addis Ababa and the detailed geographical location of the study area has been stated in a previously published article.²⁰ Children younger than 15 years old directed to the operating room for FB removal of ear, nose, and upper esophageal under general anesthesia (GA) were studied.

The institution has no ENT center and specialized expertise of the study subjects; therefore, ENT-related cases presented to the outpatient clinic and referred from the surrounding center were handled by the general surgeon.

2.2 | Inclusion criteria

The child's medical charts of documented age less than 15 years old and FB removal under GA were inclusion criteria.

2.3 | Exclusion criteria

The child's medical charts with incomplete data were excluded.

2.4 | Sample size determination and sample technique

The sample size was not calculated rather we included all eligible child's medical charts.

2.5 | Data collection technique

Data were collected from the child's medical chart by using a checklist prepared based on previous literature. Data were collected by two nurses after training was given to assure the quality of data. Supervision during data collection was also made by the principal investigator.

2.6 | Data interpretation and statistical analysis

Collected data were entered into SPSS version 20 for data analysis. Descriptive analysis was done by using age, sex, FB site of lodgment, FB types, management outcome, and any associated complications. Categorical variables were expressed by frequency distribution. Continuous variables were described in the forms of mean, range, and SD.

2.7 | Clinical practice

The diagnosis of all these patients was made based on history and clinical findings. Anterior rhinoscope and otoscope were performed for patients presented with nasal and ear FBs, respectively. Rarely, neck and chest x-ray was carried out in accordance to clinical features of patients and physician in charge request in our clinical practice. The legal guardian of the children was received written informed consent to proceed with the removal of FB under GA after the preanesthetic evaluation was done.

The FB removal was done by a general surgeon in collaboration with a senior anesthetist and operating room nurses. The procedure was performed under GA with spontaneous ventilation. Patients were monitored following removal of FB and discharged as a day case unless hospitalization is required.

For the FB in the ear; we used a right-angle hook, syringe irrigation, suctioning, and sometimes mosquito forceps since we did not have appropriate ear forceps like alligator or crocodile forceps. For the FB in the nose; we used a nasal speculum and Tobey forceps commonly for graspable FBs. We used a right-angle hook, and suctioning occasionally. We used torchlight and/or lights of our cell phones for visualization since we do not have an otoscope or headlight.

We commonly used laryngoscope (pediatric size) which is Macintosh type and Magill forceps to remove FBs in the upper esophagus.

3 | RESULTS

A total of 535 cases presented with complaints of lodged FBs of ear, nose, and upper esophageal during the study period. More than two-thirds of FB was extracted at the outpatient department. Only 169 (31.4%) in whom FB removal attempt was failed and/or uncooperative younger children were managed in the operating room under GA.

There were 99 (58.58%) male and 70 (41.42%) female patients with a male to female ratio of 1.4:1. The age was ranged from

4 months to 15 years old with a mean age of 4.45 years and a median age of 3 years. Under 5 years old children comprises 61.5% of total cases while only 9.5% of cases were aged between 11 to 15 years old (Table 1).

3.1 | FB types and anatomic sites of impaction

The ear was the commonest anatomic site of FB impaction which accounted for 97 (57.4%) followed by nose 60 (35.5%) and upper esophageal 12 (7.4%). FBs impaction: cereals or seeds (pea, chickpea, corn, bean, peanut, wheat, barely) constituted 102 (60.35%, followed by beads 27 [15.98%]) (Table 2).

3.2 | The complications of FB and its removal

Most of the patients (81.65%) presented with different types of FB were successfully removed under GA. Only 18.35% were associated with complications either due to the FB itself or efforts of removal attempts. The main complications were minimal epistaxis (6.51%) from the nose, canal abrasion (5.92%), and canal laceration and/or bleeding (3.55%) in the ear, failed to extract and laryngospasm in the upper

TABLE 1 Age distribution of study participants

Age (years)	Numbers	Percentage
0-5	104	61.5%
6-10	49	29%
10-15	16	9.5%
Total	169	100%

TABLE 2 Foreign body types and anatomic sites of impaction

Types of FB	Anatomic sites			Total (frequency, %)
	Ear (frequency)	Nose (frequency)	Upper esophageal (frequency)	
Cereals or seeds	58	44	0	102 (60.35%)
Beads	21	6	0	27 (15.98%)
Cotton bud	8	0	0	8 (4.73%)
Plastic objects	6	6	3	15 (8.89%)
Coins	0	0	9	9 (5.32%)
Paper	1	0	0	1 (0.59%)
Metallic objects	3	4	0	7 (4.14%)
Total	97 (57.4%)	60 (35.5%)	12 (7.4%)	169 (100%)

Abbreviation: FB, foreign body.

TABLE 3 Complication of FB and its removal

Type of complication	Ear (frequency, %)	Nose (frequency, %)	Upper esophageal (frequency, %)
Failed to extract	0	0	2 (1.185%)
Laryngospasm	0	0	2 (1.185%)
Canal abrasion	10 (5.92%)	0	0
Canal laceration and/or bleeding	6 (3.55%)	0	0
Minimal epistaxis	0	11 (6.51%)	0
Mortality	0	0	0
Total	16 (9.47%)	11 (6.51%)	4 (2.36%)

Abbreviation: FB, foreign body.

esophageal (2.36%). Those two patients that failed to extract the FB from the upper esophageal and dislodged to the distal esophagus during the removal attempt were referred to a specialized center for endoscopic evaluation and better management. Those two patients associated with laryngospasm immediately after removal of the coin were managed by continuous positive pressure ventilation (Table 3).

4 | DISCUSSION

This study reveals 31.4% of FB impaction of ENT required GA for removal. In contrast to the present result, different studies^{2,10,21,22} conducted in different settings reported that only 4% to 9.37% of FB impacted to ENT required GA. This significant difference might be explained by the lack of a well-equipped ENT center and specialized expertise in our setting. In addition, removal attempts made by non-ENT surgeons might increase the chance of GA requirement.

Males are predominantly presented with FB of ENT, as revealed by the present study. This finding is supported by different studies conducted in different countries.²³⁻²⁶ Contrary, other studies found insignificant differences^{5,27} and female preponderance compared to male counterparts.¹⁰

In the current study, the majority of the cases which constitute 61.5% of total FB were found in under 5 years old younger children. In agreement with the present finding, previous reports of Afolabi et al³ and Ibekwe et al⁵ reported that under 5 years old young children were predominantly affected compared to another age group. Other studies also observed consistent with our data.^{7,28} This was a peak age group in which children started to explore their surroundings with their senses might be the underline reason.

Regarding the anatomic site, FBs of the ear were the most common 61.5% followed by nose 29% in this study. Similarly, different studies share this finding.^{1,2,8,9,25,29,30} In contradiction to our result, some studies^{12,30,31} reported that the majority of FB was found in the nasal cavity. In another study, the upper esophageal (62%) was reported as the commonest anatomic site of FB aspiration followed by ear and nose.²³

Various types of impacted FB observed in the present study were cereals or seeds, which constituted 60.35% of total cases followed by beads (15.98%), plastic toys (8.89%), coins (5.32%), and cotton bud (4.73%). This result is in line with a study done by Boufersaoui et al.⁹ In disagreement with the present finding, inorganic items like ornamental beads and balls were found as the commonest types of impacted FB in the ear, nose, and upper esophageal.^{5,12} This difference might be explained by types of impacted FB depends on the availability of objects to the surrounding varied across the country. Organic FBs impaction is predominant because they are very commonly available and used by many children as toys in low-income countries.

In our study, despite there have been one or multiple attempts of removal before presenting to the operation theater, most of the cases (81.65%) were successfully treated under GA. The main complications

observed in this study were minimal epistaxis in the nasal cavity, canal abrasion, and canal laceration and/or bleeding in-ear, failure to extract, and laryngospasm in the upper esophageal.

Literature also revealed a complication rate following FB removal of ear, nose, and upper esophageal was approximated between 9% and 25%.^{2,5,24} In our study, associated complication of 18.35% of 169 children was within the acceptable range. The complication that occurred is due to either the FB itself or a removal attempt.

5 | CONCLUSION

Our study found that FBs of ear, nose, and upper esophageal managed under GA in the operating room were most common in children less than 5 years old. The types of FB that constituted the highest number were cereals or seeds. The ear was the commonest site of FB impaction. The present study observed that the majority of FB removed under GA by a general surgeon was managed safely within the acceptable range of complications.

5.1 | Recommendation

We strongly recommend for the further coming researchers to study the pattern and management practice of FB removal from ENT and its associated factors in a wider population to generate better evidence.

5.2 | Limitation of the study

The limitation of the study was retrospective descriptive nature of the study.

5.3 | Strength

The strength of our work might be, we tried to describe the characteristics of children's FB impaction pattern, type, and management.

ACKNOWLEDGMENTS

Our appreciation goes to Wolkite University for giving us ethical clearance. Our thanks also go to data collectors and study participants who were involved during data collection time.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Each author has contributed to all four of the aspects below per ICMJE standards.

1. Have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;

2. Been involved in drafting the manuscript or revising it critically for important intellectual content;
3. Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; and
4. Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

DATA AVAILABILITY STATEMENT

Data are available from the first author based on a reasonable request.

ETHICAL APPROVAL

Ethical clearance was obtained from the Wolkite University College of Health Sciences ethical clearance committee, and confidentiality of the information was assured by using code numbers than personal identification like names and keeping questionnaires locked in a secured place.

ORCID

Dereje Zewdu  <https://orcid.org/0000-0001-9819-1842>

REFERENCES

1. Parajuli R. Foreign bodies in the ear, nose and upper esophageal: an experience in a tertiary care hospital in central Nepal. *Int Arch Otorhinolaryngol.* 2015;19(2):121-123.
2. da Silva BSR, Souza LO, Camera MG, Tamiso AGB, Castanheira LVR. Foreign bodies in otorhinolaryngology: a study of 128 cases. *Int Arch Otorhinolaryngol.* 2009;13:394-399.
3. Afolabi O, Suleiman A, Aremu S, et al. An audit of paediatric nasal foreign bodies in Ilorin, Nigeria. *S Afr J Child Health.* 2009;3(2):64-67.
4. Shrestha I, Shrestha B, Amatya R. Analysis of ear, nose and upper esophageal foreign bodies in Dhulikhel Hospital. *Kathmandu Univ Med J.* 2012;10(2):4-8.
5. Ibekwe MU, Onotai LO, Otaigbe B. Foreign body in the ear, nose and upper esophageal in children: a five year review in Niger delta. *Afr J Paediatr Surg.* 2012;9(1):3-7.
6. Afolabi O, Alabi B, Segun-Busari S, Dunmade A, Ologe F. Paediatric aural foreign bodies: a challenge to care givers. *Internet J Otorhinolaryngol.* 2009;11(1):1-5.
7. Foltran F, Ballali S, Passali FM, et al. Released under the Official Information Act 1982. *Int J Paediatr Otorhinolaryngol.* 2012;76:S12-S19.
8. Perera H, Fernando S, Yasawardena A, Karunaratne I. Prevalence of attention deficit hyperactivity disorder (ADHD) in children presenting with self-inserted nasal and aural foreign bodies. *Int J Paediatr Otorhinolaryngol.* 2009;73(10):1362-1364.
9. Boufersaoui A, Smati L, Benhalla K, et al. Foreign body aspiration in children: experience from 2624 patients. *Int J Paediatr Otorhinolaryngol.* 2013;77(10):1683-1688.
10. Çelik M, Olgun B, Altıntaş A, Yegin Y, Kayhan FT. Evaluation of patients with nasal foreign bodies. *Haydarpaşa Numune Med J.* 2018; 58:79-84.
11. Pecorari G, Tavormina P, Riva G, Landolfo V, Raimondo L, Garzaro M. Ear, nose and upper esophageal foreign bodies: the experience of the Pediatric Hospital of Turin. *J Paediatr Child Health.* 2014;50(12): 978-984.
12. Khan AR, Arif S. Ear nose and upper esophageal injuries in children. *J Ayub Med Coll Abbottabad.* 2005;17(1):54-56.
13. Figueriedo R, Azevedo A, Kos A, Tomita S. Complications of ear, nose and upper esophageal foreign bodies. *Braz J Otorhinolaryngol.* 2008; 74:7-15.
14. Olajuyin O, Olatunya OS. Aural foreign body extraction in children: a double-edged sword. *Pan Afr Med J.* 2015;20(1):1-7.
15. Guidera AK, Stegehuis HR. Button batteries: the worst case scenario in nasal foreign bodies. *NZ Med J.* 2010;123(1313):68-73.
16. Kim IA, Shapiro N, Bhattacharyya N. The national cost burden of bronchial foreign body aspiration in children. *Laryngoscope.* 2015; 125(5):1221-1224.
17. Lowe DA, Vasquez R, Maniaci V. Foreign body aspiration in children. *Clin Pediatr Emerg Med.* 2015;16(3):140-148.
18. Cheng J, Liu B, Farjat AE, Routh J. The public health resource utilization impact of airway foreign bodies in children. *Int J Paediatr Otorhinolaryngol.* 2017;96:68-71.
19. Gordon DM, Frenning S, Draper HR, Kokeb M. Prevalence and burden of diseases presenting to a general pediatrics ward in Gondar, Ethiopia. *J Trop Pediatr.* 2013;59(5):350-357.
20. Kerebeh H. Contemporary land suitability analysis for urban expansion in Welkite town, Gurage zone, Ethiopia. *J Geogr Reg Plann.* 2020; 13(4):91-98.
21. Ologe F, Dunmade A, Afolabi O. Aural foreign bodies in children. *Indian J Paediatr.* 2007;74(8):755-758.
22. Sarkar S, Roychoudhury A, Roychaudhuri B. Foreign bodies in ENT in a teaching hospital in Eastern India. *Indian J Otolaryngol Head Neck Surg.* 2010;62(2):118-120.
23. Al-Juboori AN. Aural foreign bodies: descriptive study of 224 patients in Al-Fallujah General Hospital, Iraq. *Int J Otolaryngol.* 2013;2013:401289.
24. Adegbiji WA, Amutta SB. Prevalence of foreign body in the otolaryngology service in Ado Ekiti. *J Adv Med Med Res.* 2018;27:1-8.
25. Ibrahim Sersar S, Hassan Rizk W, Bilal M, et al. Inhaled foreign bodies: presentation, management and value of history and plain chest radiography in delayed presentation. *Otolaryngol Head Neck Surg.* 2006; 134(1):92-99.
26. Tariq SM, George J, Srinivasan S. Inhaled foreign bodies in adolescents and adults. *Monaldi Arch Chest Dis.* 2005;63(4):193-198.
27. Hira İ, Tofar M, Bayram A, Yaşar M, Mutlu C, Özcan İ. Childhood nasal foreign bodies: analysis of 1724 cases. *Turk Arch Otorhinolaryngol.* 2019;57(4):187-190.
28. Chai CK, Tang IP, Tan TY, Jong D. A review of ear, nose and upper esophageal foreign bodies in Sarawak General Hospital. A five year experience. *Med J Malaysia.* 2012;67(1):17.
29. Kamran M. Foreign bodies in ear, nose and upper esophageal—a clinical audit. *J Rawal Med Coll.* 2017;21(1):72-74.
30. Mukherjee A, Haldar D, Dutta S, Dutta M, Saha J, Sinha R. Ear, nose and upper esophageal foreign bodies in children: a search for socio-demographic correlates. *Int J Paediatr Otorhinolaryngol.* 2011;75(4):510-512.
31. Bakhshae M, Hebrani P, Shams M, Salehi M, Ghaffari A, Rajati M. Psychological status in children with ear and nose foreign body insertion. *Int J Paediatr Otorhinolaryngol.* 2017;92:103-107.

How to cite this article: Zewdu D, Wondwosen M, Chufamo M, et al. The practice of foreign body removal from the ear, nose, and upper esophageal in children in Ethiopia: A retrospective descriptive study. *Laryngoscope Investigative Otolaryngology.* 2021;6(6):1316-1320. doi:10.1002/lio2.688