



# Clinical spectrum of ear, nose and throat foreign bodies at a tertiary hospital: a cross-sectional study

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**Background:** Presence of foreign bodies (FBs) in the ears and upper aerodigestive tract is a common encounter in children unlike adults in otorhinolaryngology practice. FBs form a major part of emergencies in otorhinolaryngology. Studies on ear, nose and throat FBs in Tanzania are scarce.

**Objective:** To determine the clinical spectrum of ear, nose and throat FBs at the largest tertiary hospital.

**Methods:** A descriptive hospital based cross-sectional study was conducted where 95 patients were recruited at the Hospital from December 2019 to May 2020. Data were collected using semi-structured questionnaires and analyzed using Statistical Package for the Social Sciences (SPSSs) version 24.

**Results:** In this study, there were more females, 56 (58.9%) than males, 39 (41.1%) with female to male ratio being 1.4:1. Children aged younger than 10 years predominated in this study, 69 (72.6%). The nose, 36 (37.9%) and ear, 29 (30.5%) were the commonest sites where FBs lodged followed by the pharynx, 22 (23.2%) and oesophagus, 10 (8.4%). Regarding types of FBs, inorganic types, 49 (51.6%) predominated and were mostly coins, 17 (17.9%). Majority of FBs were removed in less than 24 h (53.7%) and complications were found in 29 (30.5%) patients and being more pronounced with nasal FBs. Majority of those with complications presented to the hospital 24–72 h post lodging of FBs.

**Conclusion:** FBs were encountered more commonly in children aged younger than 10 years. The nose was the commonly affected anatomical site followed by the ear, pharynx and oesophagus. The commonest FB was a coin. The inorganic FB type predominated and the most common inorganic type was a coin while the commonest organic type was a seed. Complications were encountered in those who presented between 24 and 72 h post FB lodgment.

**Keywords:** ear, Foreign bodies, nose, otorhinolaryngology, tanzania, throat

## Introduction

The main cause of morbidity and mortality in children under 3 years of age remain to be foreign bodies (FBs) in the ears and upper aerodigestive tract and similarly they are reported to be one of the commonest emergencies in otorhinolaryngology practice worldwide<sup>[1]</sup>. There has been a great public advocacy especially in developed countries thus raising public awareness on the FBs

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## HIGHLIGHTS

- Foreign bodies (FBs) in ears, nose and throat are a common practice in otorhinolaryngology.
- FBs in otorhinolaryngology remains to be the main cause of morbidity and mortality in children.
- FB ingestion in adults is often accidental and encountered in mentally retarded individuals.
- Prompt intervention of FBs remains to be of paramount importance.
- FBs may be deliberately swallowed for ritual purposes.

but still accounting for 11% of otorhinolaryngological emergencies in such settings<sup>[2]</sup>.

There has been a variable prevalence of FBs in the ears and upper aerodigestive tract in different parts of the world and in Africa the prevalence is reported to be high and varies between 57 and 80%<sup>[2]</sup>. Agewise children are more vulnerable when ingestion of FBs is to be considered<sup>[3]</sup>. The higher burden of FBs among children may be due to their habit of trying to inquire and explore everything that comes unto their sight especially in absence or little supervision by their parents or caretakers<sup>[4]</sup>.

Ingestion of FBs in adults is a very rare encounter and if the event occur it is often accidental and mostly in individuals who are mentally retarded, advanced aged patients, alcoholic patients, those on sedatives and also may follow dental certain procedures

such as tooth extraction or placement of dentures<sup>[5]</sup>. Sometimes FBs may be unusually ingested for ritual purposes<sup>[6]</sup>.

In Tanzania, the overall incidence of FBs in the ears and upper aerodigestive tract is estimated to be 2.46% at Muhimbili National Hospital<sup>[7]</sup> while at Bugando Medical Centre the prevalence of FBs in the upper aerodigestive tract was found to be 6.65%<sup>[8]</sup>.

Despite FBs ingestion or insertion into the ears being the commonest encounter in daily otorhinolaryngology practice, there is no any study to date that has explored the spectrum of ear, nose and throat FBs at the study area and this study aimed to address such an existing gap in an effort to curb the associated morbidity and mortality.

**Materials and methods**

**Study design, duration and study area**

A descriptive hospital based cross-sectional study was conducted where 95 patients were recruited at the hospital from December 2019 to May 2020.

**Study population**

Patients with a history of ingestion of FBs or insertion of FBs into the ears and nose upon consenting. A written informed consent from parents/caretakers was obtained for those participants aged younger than 18 years.

**Sampling technique**

Convenient sampling technique was used to recruit the desired number of study participants.

**Patients' recruitment strategy**

Once a patient was suspected to have a FB in the ear or aerodigestive tract, a thorough history and physical examination was performed by one of the researchers who is a registered otorhinolaryngologist and investigations such as haemoglobin level and X-rays were also ordered as preoperative work ups. Patients were recruited until the desired sample size was attained.

**Inclusion criteria**

Patients with a history of ingesting a FB or inserted a FB into the ear or nose and have underwent thorough examination including X-ray, otoscopy, rhinoscopy or laryngoscopy.

Variable	n (%)
Age group (years)	
< 10	69 (72.6)
10–20	9 (9.5)
> 20	17 (17.9)
Sex	
Male	39 (41.1)
Female	56 (58.9)

Type of foreign body	n (%)
I. Organic	46 (48.4)
Seed	25 (26.3)
Insect	8 (8.4)
Meat bolus	1 (1.1)
Fish bone	12 (12.6)
II. Inorganic	49 (51.6)
Coin	17 (17.9)
Battery	1 (1.1)
Plastic object	7 (7.4)
Wooden object	3 (3.2)
Others	21 (22.1)

**Exclusion criteria**

Patients with a history of ingesting FBs but by the time they are reviewed by one of the researcher the FB was in the stomach or other part of the alimentary tract below the stomach.

**Sample size calculation:**

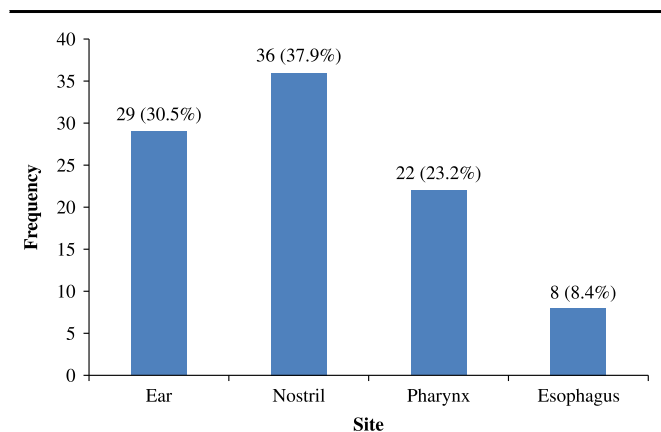
All the 95 patients who had a history of ingesting FBs or inserted a FB into the ear or nose and presented at the tertiary hospital during the study period constituted the desired sample size.

**Data collection:**

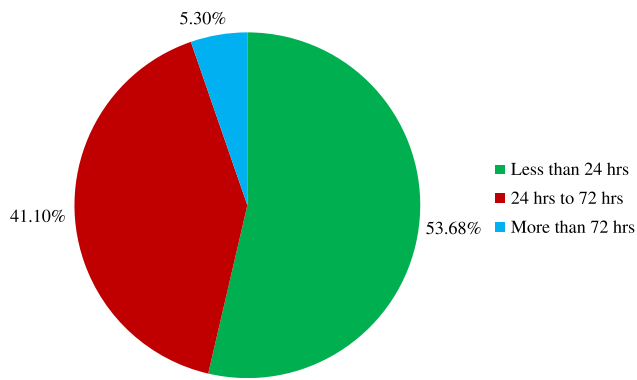
Data were collected using semi-structured questionnaires and entered into Statistical Package for the Social Science (SPSS) and data cleaning was done to ensure data cleanliness.

**Data analysis:**

Data was analysed using SPSS version 24. Quantitative variables were analyzed using median percentages.  $\chi^2$  and fishers exact test was used to determine the association between independent and dependent variables. A P value less than 0.05 was considered to be statistically significant.



**Figure 1.** Distribution of anatomical location of the various foreign bodies.



**Figure 2.** Distribution of the duration from lodging of foreign bodies to their removal.

**Ethical considerations and consent to participate**

The University ethics committee approved all experimental protocols. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from the participants before being recruiting them into the study and a written informed consent from parents/caretakers was obtained for those participants aged younger than 18 years. The work has been reported in line with the STROCCS criteria<sup>[9]</sup>.

**Results**

**Age and sex distribution of study participants**

A total of 95 patients were recruited in this study and the age of the patients ranged from 2 to 55 years with median age of 5 years and children aged younger than 10 years predominated in this study, 69 (72.6%). There were more females, 56 (58.9%) than males, 39 (41.1%) with female to male ratio being 1.4:1. (Table 1).

**Distribution of the types of FBs, anatomical location and duration from lodging to removal of FBs**

The commonest encountered FBs were inorganic (51.6%) types followed by organic types, (48.4%). The common inorganic FBs were coins (17.9%) and organic ones were seeds (26.3%) (Table 2). Most of the FBs were encountered in the nostrils, (37.9%) followed by the ears (30.5%), pharynx (23.2%) and oesophagus (8.4%) (Fig. 1). On the other hand, 53.6% of the

**Table 4**

**Distribution of FB site according to age**

Age group (years)	Sites, n (%)				
	Ear	Nostril	Pharynx	Oesophagus	Total
< 10	15 (21.7)	35 (50.7)	12 (17.4)	7 (10.1)	69 (72.63)
10–20	3 (33.3)	1 (11.1)	4 (44.4)	1 (11.1)	9 (9.47)
> 20	11 (64.7)	0	6 (35.3)	0	17 (17.89)
Total	29 (30.5)	36 (37.9)	22 (23.2)	8 (8.4)	95 (100)

FB, foreign body.

patients presented at our hospital in less than 24 h after lodging of FBs, 41.1% of them presented between 24 and 72 h and 5.3% of them presented after 72 h of lodgment of FBs in specified anatomical sites. (Fig. 2).

**Distribution of the various types of FBs and their anatomical location by age of patients**

The FBs types that were encountered in the age group younger than 10 years were seeds (34.8%) and coins (24.6%) while fish bone was common in the age group of 10–20 years (44.4%) and above 20 years (35.3%). (P value of 0.000) (Table 3). Among those patients aged younger than 10 years, 50.7% of the FBs were encountered in the nostrils, 44.4% in the pharynx among those aged 10–20 years and 64.7% in the ears among those aged older than 20 years (P = 0.000) (Table 4).

**FB sites distribution according to types of FBs, duration of FB removal by anatomical site and types of FBs according to duration at their removal**

Organic FBs were commonly encountered in the nostrils (45.7%) while inorganic FBs were commonly encountered in the ears (34.7%). (P = 0.000) (Table 5). FBs in the oesophagus (15.7%) and in the pharynx (31.4%) were removed in less than 24 h, while FBs in nostrils (51.3%) and ears (35.9%) were removed between 24 and 72 h. (P = 0.02) (Table 6). Meat bolus (2.0%) insects (13.7%) and coins (27.5%) were the FBs that were removed in less than 24 h, while batteries (2.6%), seeds (41.0%), plastic objects (10.2%) and other inorganic FBs were removed between 24 and 72 h. (P = 0.01) (Table 7).

**Distribution of the various complications of FBs and the type of complication according to anatomical site (N = 29).**

In our study 30.5% of patients who had FBs in the ears and aerodigestive tract developed complications that were due to either FB or procedure-related. (Table 8). The complications were

**Table 3**

**Distribution of FBs by age of patients**

Age group	Type of FB, n (%)									Total
	Seed	Insect	Meat bolus	Fish bone	Coin	Battery	Plastic object	Wooden object	Other inorganic	
< 10	24 (34.8)	2 (2.9)	0 (0.0)	2 (2.9)	17 (24.6)	1 (1.4)	6 (8.7)	3 (4.3)	14 (20.3)	69 (72.6)
10–20	1 (11.1)	1 (11.1)	1 (11.1)	4 (44.4)	0	0	1 (11.1)	0	1 (11.1)	9 (9.5)
> 20	0	5 (29.4)	0	6 (35.3)	0	0	0	0	6 (35.3)	17 (17.9)
Total	25 (26.3)	8 (8.4)	1 (1.1)	12 (12.6)	17 (17.9)	1 (1.1)	7 (7.4)	3 (3.2)	21 (22.1)	95 (100)

FB, foreign body.

**Table 5**  
Distribution of FB sites according to type

Type of FB	Sites, n (%)				Total
	Ear	Nostril	Pharynx	Oesophagus	
Organic	12 (26.1)	21 (45.7)	12 (26.1)	1 (2.2)	46 (48.4)
Inorganic	17 (34.7)	15 (30.6)	10 (20.4)	7 (14.3)	49 (51.6)
Total	29 (30.5)	36 (37.9)	22 (23.2)	8 (8.4)	95 (100)

FB, foreign body.

commonly encountered in the nostrils (65.5%) followed by the pharynx (20.7%) and the ears (13.8%). However, no complications were observed in the oesophagus (Table 9).

**Distribution of the complications according to type, site and duration of FBs**

Majority of FB-related (91.7%) and procedure-related (100.0%) complications were of the organic FBs.

Most of the FBs-related complications (50.0%) were encountered in the nostrils while most procedure-related complications (75.0%) were encountered in the ears

Complications were commonly seen in those patients who presented to the hospital between 24 and 72 h (84.6%) and were both FBs-related and procedure-related complications (Table 10).

**Discussion**

It is a very common practice to find children unlike adults having FBs in the ears and upper aerodigestive tract thus efforts must be spearheaded to reduce this burden among children. Studies on the ear, nose and throat FBs are scarce in Tanzania despite being the commonest encounter in clinical practice and therefore this study aimed to address such an existing gap of knowledge.

FBs in the ears, nose and throat were commonly encountered among those aged younger than 10 years, (72.63%) similar to what was found in studies done in India<sup>[10,11]</sup> and Nigeria<sup>[2]</sup>. The similarity may be attributed by the predominant age group in those studies since children tends to have curiosity to explore their environment, imitation and lack of supervision by their parents.

Regarding sex predominance in our study, female preponderance was observed with female to male ratio being 1.4:1. Such finding appears to be similar to what was found in Portugal<sup>[12]</sup> but dissimilar to what was found in the study from Tanzania mainland<sup>[7]</sup>.

In this study inorganic FBs (51.6%) were commonly encountered in the ear, nose and throat and the commonest inorganic FB was the coin (17.9%). Such finding appears to be in line with

**Table 6**  
Distribution of duration at foreign body removal by anatomical sites

Site	< 24 h, n (%)	24–72 h, n (%)	> 72 h, n (%)	Total
Ear	14 (27.4)	14 (35.9)	1 (20.0)	29 (30.5)
Nostril	13 (25.5)	20 (51.3)	3 (60.0)	36 (37.9)
Pharynx	16 (31.4)	5 (12.8)	1 (20.0)	22 (23.2)
Oesophagus	8 (15.7)	0	0	8 (8.4)
Total	51 (53.7)	39 (41.1)	5 (5.3)	95 (100)

**Table 7**  
Distribution of FB types according to their duration at removal

FB type	Duration, n (%)			Total
	< 24 h	24–72 h	> 72 h	
Seed	7 (13.7)	16 (41.0)	2 (40.0)	25 (26.3)
Insect	7 (13.7)	1 (2.6)	0	8 (8.4)
Meat bolus	1 (2.0)	0	0	1 (1.1)
Fish bone	9 (17.6)	2 (5.1)	1 (20.0)	12 (12.6)
Coin	14 (27.5)	3 (7.7)	0	17 (17.8)
Battery	0	1 (2.6)	0	1 (1.1)
Plastic	3 (5.9)	4 (10.2)	0	7 (7.4)
Wooden	2 (3.9)	1 (2.6)	0	3 (3.2)
Other inorganic	8 (15.7)	11 (28.2)	2 (40.0)	21 (22.1)
Total	51 (53.7)	39 (41.1)	5 (5.3)	95 (100)

FB, foreign body.

what was found in Tanzania mainland<sup>[7,8]</sup>, Uganda<sup>[13]</sup> and Italy<sup>[14]</sup>.

Pertaining the affected anatomical sites involved by FBs in our study, the nose (37.9%) was the commonest involved site followed by the ear (30.5%), pharynx (23.2%) and oesophagus (8.4%). Such finding appears to be similar to what was found in the study that was conducted in Tanzania mainland<sup>[7]</sup>, Germany<sup>[15]</sup>, and Nigeria<sup>[16]</sup>. The commonest FB in the nose was baobab seed (26.3%). This may be because of the eating habits of baobab seeds since there are plenty baobab trees in the study area.

The ear was the second commonest involved anatomical site (30.5%) and baobab seed was the predominant FB and others included cotton buds, matchsticks and insects. Such findings appears to be in line with those from Uganda<sup>[13]</sup>, Tanzania mainland<sup>[7]</sup>, Nigeria<sup>[16]</sup> and Italy<sup>[17]</sup>.

Regarding FBs in the pharynx (oropharynx and hypopharynx) in our study, tonsillar complex was the commonest involved anatomical subsite and this may be because of residents in the study area consuming fish in most occasions thus having impacted fish bones in the tonsillar complex. FBs in the hypopharynx were commonly found at the post cricoid space and were predominantly coins. On the other hand, the cervical oesophagus was the predominant part of the oesophagus that was commonly involved by FBs in our study. These findings appear to be similar to what was found in studies from Tanzania mainland<sup>[7,8]</sup> and Nigeria<sup>[16]</sup>.

Pertaining duration of lodging of FBs at the various anatomical sites by the time they are attended at the hospital, Most FBs had lodged less than 24 h (53.7%), whereas 41.1% lodged between 24 and 72 h and 5.3% lodged greater than 72 h by the time they are first attended at our tertiary hospital. Most FBs in the pharynx (31.4%) and oesophagus (15.7%) lodged in less than 24 h while those in the ear lodged equally less than 24 h and between 24 and

**Table 8**  
Distribution of complications of foreign bodies (N = 95)

Complications	n (%)
Yes	29 (30.5)
FB-related only	12 (41.4)
Procedure-related only	4 (13.8)
Both	13 (44.8)
No	66 (69.5)

FB, foreign body.

**Table 9**  
**Distribution of type of complications according to site (N = 29, which is the total number of patients with complications)**

Site	Cause of complication	Type of complication	n (%)
Ear	FB-related	Otitis externa	1 (3.4)
	Procedure-related	Bleeding	2 (6.9)
		Ear drum perforation	1 (3.5)
Nose	FB-related	Epistaxis	3 (10.3)
		Purulent rhinorrhea	12 (41.4)
	Procedure-related	Epistaxis	4 (13.8)
Pharynx	FB-related	Laceration	5 (17.2)
	Procedure-related	Bleeding	1 (3.5)
Total			29 (100)

FB, foreign body.

72 h (48.3%) and in the nose lodged mostly between 24 and 72 h (51.3%) by the time they are also first attended at our hospital. These findings appear to be in line with those from Tanzania mainland<sup>[7]</sup> and Uganda<sup>[13]</sup>. Early presentation to our hospital may be due to free health services provision to all citizens in the study area.

On the other hand complications encountered in our study were mainly FB-related only (41.4%), procedure-related only (13.8%) and both FB-related and procedure-related (44.8%) complications. Majority of FB-related and procedure-related complications were of those FBs that were removed between 24 and 72 h. However, no esophagoscopy-related complications were encountered in our study. These findings appear to be in line with those from Tanzania mainland<sup>[8]</sup>, Nigeria<sup>[2]</sup>, India<sup>[9]</sup>.

## Conclusion

Ear, nose and throat FBs were found to be common and this was commonest among those aged younger than 10 years. Majority of the FBs lodged in the nostrils followed by the ears, pharynx and oesophagus. The nature of FB and site of lodgment differed in different ages and hereby inorganic FB type predominated and the most common inorganic type was a coin while the commonest organic type was a seed. Complications were encountered in

**Table 10**  
**Distribution of complications according to type, site and duration of FBs**

	Complications, n (%)			Total
	FB-related	Procedure-related	Both FB and procedure	
FBs type				
Organic (n = 21)	11 (91.7)	4 (100.0)	6 (46.2)	21 (72.4)
Inorganic (n = 8)	1 (8.3)	0	7 (53.8)	8 (27.6)
Site of FBs				
Ear (n = 4)	1 (8.3)	3 (75.0)	0	4 (13.8)
Nostril (n = 19)	6 (50.0)	1 (25.0)	12 (92.3)	19 (65.5)
Pharynx (n = 5)	4 (33.3)	0	1 (7.7)	5 (17.2)
Oesophagus (n = 1)	1 (8.3)	0	0	1 (3.5)
Duration of FBs				
< 24 h (n = 7)	5 (41.7)	1 (25.0)	1 (7.7)	7 (24.1)
24–72 h (n = 18)	4 (33.3)	3 (75.0)	11 (84.6)	18 (62.1)
> 72 h (n = 4)	3 (25.0)	0	1 (7.7)	4 (13.8)

FB, foreign body.

those who presented between 24 and 72 h of FB lodgment and thus early visit to the hospital once a person is suspected to have a lodged FB should be advocated.

## Ethical approval

The University ethics committee approved all experimental protocols. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

## Consent

Informed consent was obtained from the participants before conducting the study and a written informed consent from parents/caretakers was obtained for those participants aged less than 18 years.

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## Author contribution

Z.S.A. participated in designing the study, data analysis and preparation of the manuscript while A.A.K., K.O.K. and E.L. participated in data analysis and preparation of the manuscript. All authors have read and approved the final manuscript.

## Conflicts of interest disclosure

The authors declare that they have no competing interests.

## Guarantor

Dr. Zephania Saitabau Abraham is the person in charge of publication of the manuscript.

## Availability of data and materials

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Provenance and peer review

Not commissioned, externally peer-reviewed.

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