

## Removal of Foreign Body in the Ear, Nose and Throat under General Anaesthesia: Our Experience at Federal Teaching Hospital Gombe, Nigeria.

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### ABSTRACT

**Background:** Removal of foreign bodies (FBs) in the Ear, Nose and Throat (ENT) constitute a significant part of the emergency procedures in Otorhinolaryngological practice. They can be removed with or without anaesthesia (local or general) depending on the location of the foreign body, age of the patient, previous attempt at removal, presence or absence of associated complication(s).

**Objective:** To determine the spectrum of ENT foreign bodies removed under general anaesthesia based on location, type, outcome and complications from foreign body impaction.

**Materials And Methods:** A 15-year retrospective review of all cases of ENT foreign bodies removed under General Anaesthesia (G.A) at the Federal Teaching Hospital Gombe, from January 2003 to December 2017 was carried out. Theatre records and patient's case notes were reviewed. Analysis was done using SPSS Version 20.0.

**Results:** A total of 628 ENT FBs were managed within the study period, out of which 93 (14.8%) were removed under GA. There were 65 (69.9%) males and 28 (30.1%) females; male to female ratio of 2.3: 1. Majority of the patients 47(50.5%), were in the 0-5 year age range. Ear rings 11 (11.8%) form the most common type of FBs removed. Hypopharynx, 23 (24.7%) constituted the commonest site of FB removed under G.A. Eighty-seven patients (93.5%) had successful removal, 5 (8.6%) patients had emergency tracheostomy due to airway obstruction by FB, while 1 (1.1%) mortality was recorded.

**Conclusion:** Foreign body removal from the Ear, Nose and Throat under general anaesthesia was mostly among under-fives, with the hypopharynx and ear rings being the commonest site and FB type respectively. Majority had successful removal without complications and mortality was low. Prompt removal by an expert team is crucial in ensuring favorable outcome.

**Key Words:** ENT Foreign bodies, Removal, General Anaesthesia, Federal Teaching Hospital Gombe.

### INTRODUCTION

Globally, Ear, Nose and Throat (ENT) Foreign bodies (FBs) are common presentations in Otorhinolaryngological (ORL) practice.<sup>1</sup> A foreign body (FB) can be considered to be an extrinsic object found accidentally or otherwise in a region, with attendant or prospective injury or tissue damage; if not appropriately managed.<sup>2-4</sup> Generally, the ENT are possible lodgement or entrapment sites for FBs, either spontaneously or accidentally, across all ages.<sup>2,4,5</sup>

ENT FBs are not uncommon in children especially below 5 years of age.<sup>6,7,8</sup> Reported prevalence vary between 57 and

80%, in this group of patients.<sup>8-11</sup> The factors attributed to this high prevalence include the inquisitive nature of children and their tendency to explore the environment, lack of vigilant guardian, blind imitation, boredom, mental retardation and attention deficit hyperactivity disorder.<sup>2,4,6,12</sup> In adults, ENT FBs are often accidental,<sup>2,7,8</sup> and have been seen to be associated with mental health anomalies<sup>6</sup> and alcohol intoxication.<sup>6</sup> However, unwonted FBs intentionally swallowed for rituals have been reported.<sup>5,7</sup>

The determinants of clinical presentation of FBs include the

nature, size, shape, location, orientation and duration of lodgement of the FB.<sup>13</sup> These greatly influence the ease of removal, either awake or with General Anaesthesia (GA). Acute onset of respiratory distress with life threatening conditions may result with Fbs in the throat while those in the ear may remain asymptomatic for a long time.<sup>13</sup>

Removal of FBs under GA is commonly indicated for those in the throat/ aero-digestive tracts as well as FB in the other regions when patients fail to cooperate with awake removal.<sup>13</sup> Raji MM et al<sup>14</sup> at FTH, Gombe, in a three year review of all the foreign bodies that were managed at the ENT Surgery department, earlier reported those removed under GA to be 21.6%.

This study was conducted on the cases of ENT foreign bodies removed under GA and the aim was to determine the sites, types and nature of the foreign bodies, routes and duration of GA , outcome of removal and complications from foreign body impaction.

**MATERIALS AND METHODS**

**STUDY SETTING:** This study was carried out in Federal Teaching Hospital Gombe, a tertiary referral hospital with ENT care services. The hospital provides specialist care to the populace of Gombe and the neighboring states including Adamawa, Taraba, Borno, Yobe and Bauchi.

**STUDY DESIGN:** A 15-year retrospective review of all cases of ENT foreign bodies removed under General Anaesthesia between January 2003 and December 2017 was conducted. Ethical permission from the from the hospital’s research ethics committee. Data obtained from theatre records and patients’ case notes included age, gender, type of foreign body, location of foreign body, route of general anaesthesia, duration under anaesthesia, outcome of removal and complication(s) from foreign body impaction.

**DATA ANALYSIS:** collated data were analyzed using SPSS Version 20.0. Results were presented in simple charts and tables utilizing descriptive statistics of frequency and percentages.

**RESULTS**

A total of 628 ENT FBs were managed within the study period, 93 of them were removed under GA, constituting 14.8%. With

a mean age (SD) of 12.5(16.4) years, the age of the patients ranged from 4 months to 70 years. Table 1 shows the age distribution of the patients.

**Table 1:Age distribution of patients**

AGE RANGE (years)	FREQUENCY (n)	PERCENTAGE (%)
0 - 5	47	50.5
6 - 10	21	22.6
11- 20	6	6.5
21- 30	7	7.5
31- 40	3	3.2
41- 50	5	5.4
51- 60	1	1.1
61- 70	3	3.2
<b>TOTAL</b>	<b>93</b>	<b>100</b>

In this study, there was male preponderance 65 (69.9%) with a male to female ratio of 2.3: 1. The most common foreign bodies were ear rings 11 (11.8%) while no foreign body was seen in 5 patients (5.4%). Table 2 shows the distribution of foreign body types. Hypopharynx 23 (24.7%) constituted the commonest site of FB removal under general anaesthesia. Table 3 shows the distribution of foreign body anatomical location while Table 4 outlines the outcome of foreign body removal. Eighty seven (93.5%) had successful removal. The routes of general anaesthesia employed are as shown in Table 5 Table 6 shows the complications of foreign body impaction. Complications from FB impaction was found in 11 (11.9%) patients. The eight (8.6%) patients that had airway obstruction from FB impaction in the laryngotracheobronchial tree presented in respiratory distress that necessitated emergency tracheostomy. The duration of FB removal under general anaesthesia ranged from 2 minutes to 210 minutes, with a mean time of 41.76 minutes. (Figure 2)

**Table 2: Distribution of foreign body types**

TYPE OF FOREIGN BODY	FREQUENCY (n)	PERCENTAGE (%)
Arrow	1	1.1
Beads	7	7.5
Broken bottle	1	1.1
Button	1	1.1
Coins	4	4.3
Cotton bud	1	1.1
Dentures	6	6.5
Duck bone	1	1.1
Ear rings	11	11.8
Fish bone	5	5.4
Fishing hook/Spring/Screw	3	3.2
Key	1	1.1
Lithium batteries	6	6.5
Meat bolus/ meat bone	4	4.3
Needles/ pins	4	4.3
No FB seen	5	5.4
Papers	4	4.3
Plastic objects	8	8.6
Seeds (grains/ fruits)	10	10.8
Small bulb	1	1.1
Spoon	1	1.1
Stick	1	1.1
Stones (graves/pebbles)	3	3.2
Wheeler	1	1.1
Whistle	3	3.2
Total	<b>93</b>	<b>100.0</b>



**Figure 1A:** An ornamental bead removed from the Right external auditory canal of a two year old female



**Figure 1B:** A specimen of a date fruit removed from the Left Nasal Cavity of a three year old male



**Figure 1C:** The left Naso-antral FB (piece of a stick) removed from a 27year old male



**Figure 1d:** Specimen of a torch light bulb removed by rigid laryngoscope from the hypopharynx of a six year old female

**Table 3: Distribution of foreign body anatomical location**

LOCATION OF FB	FREQUENCY (n)	PERCENTAGE (%)
<b>EXTERNAL AUDITORY CANAL (EAC)</b>		
Right EAC	12	12.9
Left EAC	5	5.4
Both	17	18.3
<b>NOSE</b>		
Right Nostril	8	8.6
Left Nostril	13	14.0
Both	21	22.6
<b>THROAT</b>		
	23	24.7
Hypopharynx		
Parapharyngeal space	1	1.1
Cricopharyngeal junction	1	1.1
Anterior Neck	1	1.1
Oropharynx	3	3.2
Nasopharynx	4	4.3
Oesophagus	9	9.7
Laryngotracheobronchial tree	13	14.0
<b>TOTAL</b>	<b>93</b>	<b>100.0</b>

**Table 4: Outcome of foreign body removal**

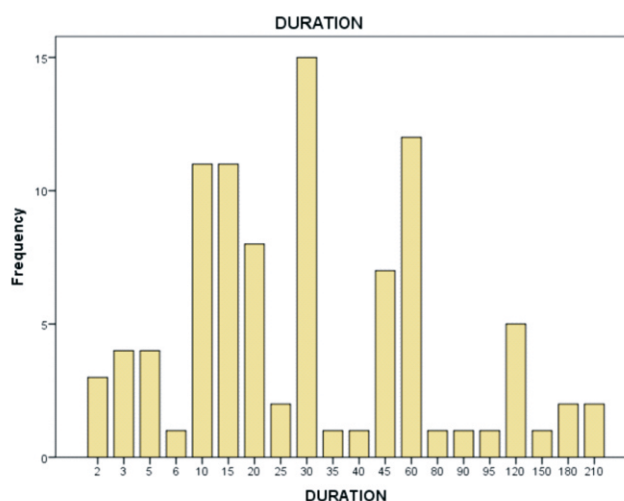
OUTCOME	FREQUENCY (n)	PERCENTAGE (%)
Death	1	1.1
Not removed (REFERRED)	5	5.4
Removed	87	93.5
<b>Total</b>	<b>93</b>	<b>100.0</b>

**Table 5: Route of general anaesthesia**

ROUTE OF GENERAL ANAESTHESIA	FREQUENCY (n)	PERCENTAGE (%)
Tracheostomy	8	8.6
Endotracheal intubation	23	24.7
Spontaneous breathing	62	66.7
<b>Total</b>	<b>93</b>	<b>100.0</b>

**Table 6: Complications from foreign body impaction (n = 11)**

COMPLICATION OF FOREIGN BODY IMPACTION	FREQUENCY (n)	PERCENTAGE (%)
Abscess	1	9.1
Soft tissue injury	2	18.2
Airway obstruction	8	72.7
<b>Total</b>	<b>11</b>	<b>100.0</b>



**Figure 2: Duration of general anaesthesia in minutes**

**DISCUSSION**

Individuals from different age group may present with ENT FB, but the frequency, anatomical distribution and types of FBs differ between extremes of life.<sup>15</sup> Most ENT FBs are found in the Ear and Nose and are easily removed without the need for any form of anaesthesia, especially in expert hands and in the absence of prior (failed) attempts.<sup>15,16</sup> While the presentation of some FBs with failed attempts at removal may be with complications, some may present with life threatening conditions which could be fatal if not promptly managed.<sup>15</sup> Indeed, for optimal care and outcome, the removal of such FBs is better done under GA.

In this study, ENT FBs removed under GA accounted for 14.8% of the total ENT FBs managed within the study period. This is lower than the 21.6% that was earlier reported by Raji MM et al.<sup>14</sup> The contrast is attributable to the difference in the study periods and number of cases seen within the periods. The current finding would be more instructive, being from a study that is over a longer period.

Majority (50.5%) in this study were in the 0-5 year age range, followed closely by 22.6% aged 6-10 years. This is in keeping with previous reports that showed high incidence of ENT FBs in children less than 10 years of age, especially under-fives.<sup>1-18</sup> This may be explained by the habitual explorative and inquisitive nature of the children as well as their attraction to such objects that could be inserted into the Ear, Nose and Throat region, as alluded to by previous studies.<sup>6,13</sup>



In our study, we found a significant male preponderance of 69.9% with male to female ratio of 2.3: 1. This is similar to the findings in some of the previous studies,<sup>3,6,16-18</sup> possibly because of the explorative nature of male children compared to their female counterparts<sup>6</sup> while other few reports showed female preponderance.<sup>2,6,13</sup>

The types and pattern of distribution of the FBs in our study was different from what was obtained in other studies.<sup>2,12,15</sup> This may be partly attributable to regional peculiarity and study design. The commonest FB in our study was ear rings (11.8%), followed by seeds/fruits/grains (10.8%). Seeds were the commonest FB in the work by Adedeji et al,<sup>6</sup> in South Western Nigeria. Omokanye et al,<sup>13</sup> in North Central Nigeria, found toys as the most common FB retrieved under GA and alluded to the accessibility of children to toys as objects of play. Ear rings may be a commonly available and accessible objects of play to most of the children in our locality. The Hypopharynx (24.7%), in particular and the aero digestive tract, in general, constituted the commonest site for the removal of FB under GA, in this study. If not promptly relieved, the possible consequences of the obstruction, discomfort and injury associated with the presence and/ or impaction of FB in the aero digestive track could be grave.

The route of GA employed in the majority was Spontaneous breathing technique (SBT) with inhalational agent, with successful removal of FB in them. SBT was used for only 21.1% in the study by Omokanye et al<sup>13</sup> while per-oral endotracheal intubation which was used for the majority of their patients (79.6%) was utilized in just 24.7% of ours. None of the FBs removed via SBT, in our study, was impacted and the location and orientation in the majority made SBT a preferred route of GA. Patients who had tracheostomy (8.6%) were subjected to SBT with inhalational agent while doing the tracheostomy under local anaesthesia with 2% Lidocaine and adrenaline, then later maintained on general anaesthesia via the Tracheostomy until the FBs were successfully removed.

With a mean time of 41.76 minutes, majority, 59(63.4%) of the FBs were removed under GA in less than 35 minutes while 20(21.5%) and 5(5.4%) were respectively removed at 1-2 hours and 2.5 - 3.5 hours. The delayed presentation of some of the patients, associated complications and possibly the orientation of upper aerodigestive FBs may be responsible for the prolonged duration of their removal under GA. The availability and use of good light sources, cameras and video

facilities in addition to appropriate endoscopes and telescopes (rigid and/ or flexible) would ease the removal of FBs and reduce the duration under GA. A prospective study on the predictors and the effect of prolonged duration of GA in Children with ENT FBs would be worthwhile.

Majority of the FBs removed under GA were in the upper aerodigestive track and their removal were done as emergency procedures. Over 90% of all the subjects had successful removal of FB. Although the duration of FB before presentation of the subjects to the hospital could not be ascertained in the majority, the location and orientation of the FBs as well as prompt intervention by experts were possible predictors of favorable outcome. A prospective study on the relationship between duration before presentation and outcome would be worthwhile.

The commonest complication seen in our study was airway obstruction from FB impaction in the laryngotracheobronchial tree in 8 (72.7%). These patients with severe respiratory distress, delayed presentation and were immediately managed with emergency tracheostomy. The mucosal injury from the impaction of the FBs led to inflammatory changes that further worsened the obstruction and prolonged the resultant hypoxia.<sup>19</sup>

The only mortality recorded in our study was from an 18 month old male child who presented in severe respiratory distress following peanut aspiration in the tracheobronchial tree. This is a similar scenario to the only mortality recorded by Ette et al.<sup>6</sup> Obviously, FB in the tracheobronchial tree is a notable cause of death in children.<sup>6</sup> The 1.1% mortality rate in our study is similar to the 0.9% mortality recorded by Ette<sup>6</sup> and Omokanye et al<sup>13</sup> but higher than the 0.13% of Chuan-Shan et al<sup>19</sup> in their review of 3028 paediatric patients with inhaled foreign bodies. This similarity and difference can be attributed to sample size, in addition to the location, nature and associated complications at surgery.

## CONCLUSION

Under-fives were the prevalent age group in our study, while the hypopharynx and ear rings were the commonest site and type of FB removed under GA respectively. SBT with inhalational agent was the route of anesthesia in the majority with a mean duration of FB removal under GA of 41.76 minutes. Most of the FBs were not impacted and were successfully removed without complications. However, complication and mortality rates of 11.9% and 1.1% were

recorded. Prompt intervention by experts gives optimal comprehensive care with favourable outcome.

#### CONFLICT OF INTERESTS

The authors declare no conflict of interests.

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